Drinking Water Quality Management Plan Annual Report

1 July 2017 – 30 June 2018

Unitywater

Document Version and Modification Control

Date	Name	Position	Modification/Action
	J. Wain	Water Quality Advisor	Draft
	B. Austin	Water Quality Technician	Draft
	C. Timms	Manager of Network Operations	Endorsement of section 6
	S. Rutledge	Water Quality Specialist	Final
	M. Zeilinga	Manager Water Solutions	Final
	S. Barnes	Executive Manager Sustainable Infrastructure Solutions	Endorsed

Service Provider Details	
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Local Government Areas	Moreton Bay Regional Council Noosa Council Sunshine Coast Council

Glossary of Terms	
<	Less than
>	Greater than
ADWG	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
DWQP	Drinking Water Quality Performance Report
AS/NZ 3500	*Australian New Zealand Standard 3500*
CCP	Critical Control Point
CFU/100mL	Colony forming units per 100 millilitres
DEWS	Department of Energy and Water Supply (the regulator)
DWDS	Drinking Water Distribution System
DWQMP	Drinking Water Quality Management Plan
E. coli	*Escherichia coli*, a bacterium which may indicate the presence of faecal contamination and therefore potential health risk
FY 2016-2017	Financial year 2016-2017
HACCP	Hazard Analysis and Critical Control Point. An approach for managing the risk of drinking water supply contamination
Intelex	Unitywater safety incident reporting system for matters such as injury & notifications/hazard/near miss/equipment damage and is also our standards certification management system for audits and investigations.
mg/L	Milligrams per litre
ML	Mega litres
mpn/100 mL	Most probable number per 100 millilitres
NPI	Northern Pipeline Interconnector
NTU	Nephelometric Turbidity Units
OFI	Opportunities For Improvement
OPRP	Operational Pre Requisite Program
RA	Risk Assessment
RMIP	Risk Management Improvement Plan
ROMM	Regional Operations Manager Meeting
SEQ	South East Queensland
SCADA	Supervisory Control and Data Acquisition
SHEQ	Safety Health Environment and Quality (Unitywater work area)
the Act	*Water Supply (Safety & Reliability) Act 2008*
VOC	Verification Of Competency
WQ	Water Quality
WTP	Water Treatment Plant

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1. Introduction

This report documents the performance of Unitywater's drinking water service with respect to water quality and performance in implementing the actions detailed in the Drinking Water Quality Management Plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act). This report documents Unitywater's performance for the period 1 July 2017 to 30 June 2018.

The report assists the Regulator to determine whether the approved DWQMP and any approval conditions have been complied with and provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

The report aligns with the requirements of the reporting template published by the Regulator and addresses the reporting requirements under Section 142(3) of the Act. Table 1 identifies the section of the report that addresses reporting requirement under Section 142(3) of the Act.

Table 1 – Sections of report that address reporting requirement under Section 142(3) of the Act

Section Ref #	Legislative Requirement under Section 142(3) of the Act	Content Guide	Section of this Report
-	Overview of operations (optional)	Contextual information of the water supply schemes that this annual report relates to.	Section 2
142(3) b	Actions taken to implement the DWQMP	Description of activities undertaken during the reporting period to implement the DWQMP: • Progress in implementing the risk management improvement program (RMIP) • Revisions made to the operational monitoring program • Amendments made to the DWQMP	Section 3
142(3) f	Compliance with water quality criteria for drinking water	• Verification monitoring results summary for the reporting period • Commentary on water quality results the Australian Drinking Water Guidelines, *E. coli* and fluoride standards	Section 4 Appendix A
142(3) e	Notifications to the Regulator under sections 102 and 102A of *the Act*	• Non-compliances with the water quality criteria and corrective and preventive actions undertaken • Prescribed incidents or events reported to the Regulator and corrective and preventive actions undertaken	Section 5
142(3) g	Customer complaints related to water quality	• Summary of water quality complaints • Summary of events and corrective action	Section 6 Appendix B
142(3) d	Findings and recommendations of the DWQMP auditor	• Regulatory audit summary of findings • Outcomes of the DWQMP review	Section 7
142(3) c	Outcome of the DWQMP review and how issues raised have been addressed	• Amendment of the DWQMP	Section 8

2. Overview of Operations

Unitywater provides water and sewerage services to the Moreton Bay, Sunshine Coast and Noosa local authority regions. Unitywater operates and maintains more than $3.2 billion of water and sewerage infrastructure, supplying services to residential and business customers spread across 5,223 square kilometres.

Unitywater receives treated water from the bulk water supplier Seqwater. The Unitywater service area during the 2017-18 financial year had 5 supply regions, which are then broken down into 14 schemes. These regions include:

- **NPI South (Southern Grid)** – Caboolture; Bribie Island, Woodford, Redcliffe, Pine Rivers South
- **NPI North (Northern Grid)** – Noosa; Maroochy North (South Maroochy River); Maroochy South, Caloundra Coastal; Caloundra Railway Towns, Maleny
- **Dayboro** – Dayboro
- **Kenilworth** – Kenilworth
- **Pine Rivers North (Petrie)** – Pine Rivers North

Additional information is available in the 2017-18 Drinking water quality performance report (Appendix A).

The recent decommissioning of the Petrie WTP has resulted in infrastructure changes which has reduced the 5 supply regions to 4, with the incorporation of the Pine Rivers North (Petrie) supply region into the NPI South (Southern Grid) supply region. This will be reflected in the 2018-19 DWQMP report. The change to supply regions has been updated in the amended DWQMP version 10 which was submitted on the 8th November 2018.

3. Actions taken to implement the Drinking Water Quality Management Plan

Unitywater's DWQMP has evolved since the first revision was submitted in 2011 and it will continue to be updated as risk management improvement actions are completed and operational philosophies change. A description of the implementation progress and related updates made during 2017-2018 are provided in this section and section 8. The three sub sections below are included to meet the requirements described in section 3 of the DNRME Drinking Water Quality Management Plan report template.

3.1. Risk management improvement action progress

Of the actions identified in the current Risk Management Improvement Program (Table 7, of the approved DWQMP), five actions have been completed. The remaining actions are due for completion in June 2019.

3.2. Revisions made to the operational monitoring program to assist in maintaining the compliance with water quality criteria in verification monitoring.

A summary of the operational monitoring program revisions undertaken during the reporting period are included below.

- **ISO 22000:2005 Surveillance Audit** – Unitywater maintains certification against ISO 22000:2005 food safety management system, which is internationally recognised as best practice for the management of water quality. A component of the certification is the Hazard Analysis Critical Control Point (HACCP) process. The HACCP Plan describes the control measures for significant risks including critical control points (CCPs), prerequisite programs and operational prerequisite programs (OPRPs).

  The most recent independent audit against ISO 22000:2005 was completed in February 2018. The audit assessed our operational practices, work procedures, process / document control, and much more. One (1) minor non-conformance was identified, actioned and resolved.

3.3. Amendments made to the Drinking Water Quality Management Plan

There was one amendment made to the DWQMP during the 2017-18 FY. Version 9 was submitted in March and approved in June 2018. The updated plan incorporated the following key information:

- Drinking Water Quality Management Plan risk assessment which was conducted in September 2017. The risk assessment identified nine actions which were incorporated into the Risk Management Improvement Program.
- Update on the decommissioning of the Petrie WTP and detail on the infrastructure and supply changes. Note, the Pine Rivers North scheme is now supplied by the NPI, and as such the scheme has now been incorporated into the NPI Southern scheme, reducing the five schemes to four. This will be reflected in the 2018-19 DWQMP reporting and future DWQMP revision (version 10).

4. Compliance with water quality criteria for drinking water

This section is included to meet the requirements of section 4 of the DNRME Drinking Water Quality Management Plan report template.

Unitywater provides an annual summary of water quality performance to customers, available on the Unitywater website www.unitywater.com. The 2017-18 Drinking Water Quality Performance Report (Appendix A) meets the requirements for the water quality performance aspect of this document. Please note that the reported statistics do not include results derived from repeat samples, or from emergency or investigative samples undertaken in response to an elevated result.

The 2017-18 Drinking Water Quality Performance Report includes a summary of the verification monitoring results. Key points include:

- Unitywater meets the requirements set by the *Public Health Regulation 2005* for drinking water, with 99.9% of all samples free of *E. coli*.

- Unitywater meets the chemical (health-related) performance requirements[1] of the Australian Drinking Water Guidelines 2011 for every chemical tested in each of the 5 regions. [2]

5. Notifications to the regulator under sections 102 and 102A of the Act

This section is included to meet the requirements outlined in section 5 of the DNRME Drinking Water Quality Management Plan report template.

5.1. Summary of notifications

This financial year there were seven (7) instances where the Regulator was notified under sections 102 or 102A of *the Act*.

- 5 notifications involved detections of *E. coli*
- 1 notification involved two exceedances of the ADWG Guideline Value (Health) for trihalomethanes (THM)
- 1 notification of a bird carcass found on 1st August 2017 during a planned inspection of a reservoir.

Additional detail on the individual notifications has been provided below.

5.2. Detailed description of the seven notifications

Incident Description: There was an *E. coli* detection from a routine sample taken on 26/02/2018 at Pacific Blvd, Buddina from sample tap CL17DS. The result was 1mpn/100ml.

Corrective & Preventative Actions: Localised flushing was undertaken to draw chlorine residuals through the affected area. Further actions to increase chlorine residuals in the network included chlorine tablet dosing at the Pt Cartwright Reservoir, and an increase in water supply from the NPI through the Wurtulla PRV.

A review of the chlorine levels in the area showed that the affected sample tap experienced variable levels of chlorine leading up to the event. A change in source water in the Caloundra scheme contributed to issues with maintaining a satisfactory level of disinfectant to the extremities of the network. An upgrade of the chlorine dosing facility is now planned for this area of the network.

Follow up sample results: Follow up sample was taken 28/2/2018 and returned a result of <1mpn/100ml *E. coli*.

[1] Chemical (Health-related) performance is said to have met the performance requirement if the 95th percentile (a statistical calculation) for a chemical is below the Australian Drinking Water Guidelines Health Guideline Value for that chemical.

[2] Note that Unitywater receive fluoridated drinking water from Seqwater. Unitywater test for fluoride in all of our schemes. Each of these results met the requirements of Unitywater's approved verification monitoring plan.

Incident Description: There was an *E. coli* detection from a routine sample taken on 12/3/2018 at Raintree Blvd, Little Mountain from sample tap CL12DS. The result was 1mpn/100ml.

Corrective & Preventative Actions: Localised reactive flushing of the supply main and the affected sample tap. Sampling observations were reviewed along with weather conditions on the day of the detection. It was identified that the sample tap is located under tree foliage and it had been raining prior to the sample being taken. A review of the systems gave no reason to suggest that network integrity had been compromised at the time of sampling.

Follow up sample results: A follow up sample was taken on the same day and returned a result of <1mpn/100ml.

Incident Description: There were two detections of high THM's from routine samples taken on 6/3/2018. The two locations were the Boundary Rd 32ML Reservoir Dakabin (PN02RE) and Koala Cl North Lakes (PN19DS) with respective results of 0.33mg/L and 0.34mg/L.

Corrective & Preventative Actions: Both sites were supplied with water produced from the Petrie WTP, which through the deterioration of the WTP recorded higher levels of total organic carbon leaving the plant. The Petrie WTP has been decommissioned and the Pine North scheme is now supplied water through the Southern NPI, which will decrease the risk of THM formation in this area.

Follow up sample results: Follow up samples taken on the 23/3/2018 with the two affected sites recording results of 0.9mg/L and 0.99mg/L respectively.

Incident Description: There were two *E. coli* detections from routine samples taken on 12/3/2018 at Daybell St, Woodford and Wood St, D'Aguilar. The results were 4mpn/100ml and 5mpn/100ml respectively.

Corrective & Preventative Actions: These *E. coli* detections were 2 out of 5 which occurred on the same day. All positive samples were collected by a common sampler and tested by a common laboratory technician, impacting 3 different water supply schemes and included a positive *E. coli* detection in a travel blank Quality Control (QC) sample. As the purpose of the travel blank is to provide a baseline level of contamination introduced by either the transportation of the samples and/or the testing procedure, a focussed internal laboratory investigation was undertaken to determine the cause/source of the contamination.

Further investigations were carried out pertaining to the historical water quality of each site, the network performance and potential integrity issues and possible lab contamination sources. Based on this information and the detection of the positive travel blank, it was concluded that the samples were not reflective of water quality in the network at the time of sampling.

Follow up sample results: Re-tests were carried out on the affected samples including the travel blank, which all returned results of <1mpn/100ml *E. coli*. Affected sample sites were also re-sampled with all results returning a result of <1mpn/100ml *E. coli*.

Incident Description: There was a detection of *E. coli* from a routine sample taken on 12/3/2018 at Meldale Rd, Meldale. The result was 2mpn/100ml *E. coli*.

Corrective & Preventative Actions: This *E. coli* detection was 1 out of 5 which occurred on the same day. All positive samples were collected by a common sampler and tested by a common laboratory technician, impacting 3 different water supply schemes and included a positive *E. coli* detection in a travel blank Quality Control (QC) sample. As the purpose of the travel blank is to provide a baseline level of contamination introduced by either the transportation of the samples and/or the testing procedure, a focussed internal laboratory investigation was undertaken to determine the cause/source of the contamination.

Further investigations were carried out pertaining to the historical water quality of each site, the network performance and potential integrity issues and possible lab contamination sources. Based on this information and the detection of the positive travel blank, it was concluded that the samples were not reflective of water quality in the network at the time of sampling.

Follow up sample results: Re-tests were carried out on the affected samples including the travel blank, which all returned results of <1mpn/100ml *E. coli*. Affected sample sites were also re-sampled with all results returning a result of <1mpn/100ml *E. coli*.

Incident Description: There was a detection of *E. coli* from a routine sample taken on 12/3/2018 at Glasshouse Reservoir 2, Fullertons Rd, Glasshouse Mountains. The result was 5mpn/100ml *E. coli*.

Corrective & Preventative Actions: This *E. coli* detection was 1 out of 5 which occurred on the same day. All positive samples were collected by a common sampler and tested by a common laboratory technician, impacting 3 different water supply schemes and included a positive *E. coli* detection in a travel blank Quality Control (QC) sample. As the purpose of the travel blank is to provide a baseline level of contamination introduced by either the transportation of the samples and/or the testing procedure, a focussed internal laboratory investigation was undertaken to determine the cause/source of the contamination.

Further investigations were carried out pertaining to the historical water quality of each site, the network performance and potential integrity issues and possible lab contamination sources. Based on this information and the detection of the positive travel blank, it was concluded that the samples were not reflective of water quality in the network at the time of sampling.

Follow up sample results: Re-tests were carried out on the affected samples including the travel blank, which all returned results of <1mpn/100ml *E. coli*. Affected sample sites were also re-sampled with all results returning a result of <1mpn/100ml *E. coli*.

Incident Description: On 1/8/2017, as part of a routine reservoir cleaning program, Unitywater was notified by the diving contractors cleaning Morayfield Reservoir 1 that a small bird carcass had been found in the reservoir.

Corrective & Preventative Actions: The bird carcass was immediately removed by the contractor. Divers took a sample from the reservoir which was intended to be tested for Cryptosporidium and Giardia. This was subsequently cancelled after consultation with Queensland Health and determined to be a low risk due to this type of contamination associated with mammals rather than avian. A visual inspection of the reservoir including vermin proof meshing was also carried out, along with a review of water quality verification data in the affected DMA's. Additional sampling and testing of the reservoir returned satisfactory water quality results:

- E. coli <1mpn/100ml
- pH 6.98
- Turbidity 0 NTU
- Free chlorine 0.4mg/L
- Total chlorine 2.21mg/L

Based on the outcomes of the investigations, no further actions were required.

Follow up sample results: Follow up testing indicated satisfactory water quality performance at the reservoir.

6. Customer complaints related to water quality

Please note that Unitywater refers to water quality complaints as water quality 'enquiries' for categorisation purposes. The majority of customer water quality enquiries received by Unitywater are typically related to dirty water. This is often due to sediment disturbance after network events (i.e. burst mains) which have an impact on water flow direction and/or velocity. Taste and odour enquiries are the other major contributor, followed by 'Other' and 'Health'. Taste and odour enquiries are often relatable to changes in source water quality, and/or disinfectant residual levels.

Table 2 provides a summary of the water quality enquiries received by region. The table addresses the reporting requirement as per table 1 in section 6 of the DNRME Drinking Water Quality Management Plan report template.

During the reporting period, Unitywater received 568 customer water quality enquiries. This is a decrease from previous financial year 2016-2017 (757 enquiries received).

Due to the number of enquiries received in the 2017-2018 period, it is not practical to go into detail on each individual case within this report. Instead, a summary of the water quality enquiry clusters is included in Table 3 (Appendix B).

Table 2 - Customer water quality enquiries by region and scheme FY2017-2018

Water supply region	Water quality enquiry type				Grand total	Connected population (estimated) [3]	per 1000 customers
	Dirty/ milky	Taste/ odour	Health	Other			
NPI South	155	22	3	14	194	373,403	0.52
NPI North	140	66	5	7	218	429,047	0.51
Dayboro	0	0	0	0	0	2,073	0
Kenilworth	0	0	0	0	0	762	0
Pine Rivers North (Petrie)	125	25	2	4	156	91,986	1.69
Total	420	113	10	25	568	897,271	0.63

[3] Estimates of the connected population for each region were calculated in terms of the equivalent persons (EP). This involved estimating the EP for residential and non-residential land uses for the relevant 2016 ABS Census SA2 catchments. The EP estimate for each catchment within a region were then summed.

6.1. Discussion of water quality enquiries received

This discussion section is included to meet the requirements of section 6 of the DNRME Drinking Water Quality Management Plan report template.

The majority of customer water quality enquiries are related to *dirty/milky* water (73.9%). *Taste and odour* enquiries were the other major category of customer enquiries (19.9%), followed by *health* (1.8%) and *other* (4.4%).

Pine Rivers North (Petrie) region returned a high level of customer enquiries (1.69 per 1000 customers) which is above the average of 0.63 enquiries per 1000 customers.

Health – all health enquiries were prioritised for investigation. Typical response involved a site visit and onsite investigation, localised low velocity flushing, onsite monitoring / sampling of chlorine and / or turbidity levels and verbal assurance to the customer, as per Unitywater procedures.

Dirty / Milky water – Planned and unplanned works, network activity including pressure and flow fluctuations and internal plumbing issues equated for most of the dirty / milky water customer complaints throughout the distribution.

Additionally, the NPI North region was impacted by an inflow of manganese that was unable to be sufficiently removed during the treatment process at Image Flat WTP, resulting in a number of dirty water complaints.

The Pine Rivers North region also received a number of dirty water complaints associated with the decommissioning of the Petrie WTP. In order to maintain production from the Petrie WTP as part of the Petrie Rezoning Project, approximately 5ML a day was required to be scoured to compensate for the demand loss. A break at the designated scour point resulted in a sudden significant increase in flow causing dirty water.

The typical response to general dirty / milky enquiries was a low velocity hydrant flush in proximity to the customer's address and verbal assurance to the customer by visiting crew members.

Taste / Odour – Overall, the number of taste/odour enquiries has remained consistent compared to last financial year. High concentrations of Methyl-Isoborneol (MIB) and Geosmin were identified in raw source water at the Image Flat WTP, these compounds are naturally occurring organic compounds that have a strong earthy taste. This did not pose a hazard to human health, but impacted the taste of the water – which contributed to customer taste and odour enquiries in the NPI North areas. Seqwater maximized powdered activated carbon (PAC) dosing to mitigate the taste issues and investigated options for an alternate supply.

Additionally, the planned shutdown of the North Pine WTP resulted in a number of taste / odour complaints in the Pine Rivers North regions associated with the change in source water.

7. Findings and recommendations of the Drinking Water Quality Management Plan auditor

This section is included to meet the requirements of section 7 of the DNRME Drinking Water Quality Management Plan report template.

A DWQMP regulatory audit was undertaken by an independent auditor from BBTech Consulting in February / March 2016, covering the period from 2010-2016. This audit was conducted against version 7 of the DWQMP (approved in October 2015). During this review there were zero (0) non-conformances and ten (10) opportunities for improvement (OFIs) identified by the auditor.

A copy of the final audit report and response to audit findings was submitted to the DEWS in April 2016. Key findings of the audit were presented in Unitywater's Annual DWQMP Report 2015 – 2016.

The next regulatory audit of the DWQMP is scheduled to be completed by 30 March 2020.

8. Outcome of the review of the DWQMP and how issues raised have been addressed

The below sections are included to meet the requirements of section 8 of the DNRME Drinking Water Quality Management Plan report template.

Following the ISO 22000 surveillance audit in February 2018, Unitywater reviewed and updated the DWQMP. This was to incorporate findings from the whole of system risk assessment conducted in September 2017 (by ATOM Consulting) and include details on impending infrastructure changes in the Pine North Water Supply scheme. The outcomes of the 2017 risk assessment are outlined in DWQMP version 9 and actions were included in the updated RMIP (nine actions identified). In March 2018 the amended DWQMP (version 9) was submitted to DNRME and approved on the 8/06/2018.

The next internal review of the DWQMP is planned to occur before the regulatory audit in March 2020.

Appendix A – 2017-18 Drinking water quality performance report

This report is uploaded to the Unitywater webpage for customer access. Please click the link below:

https://www.unitywater.com/about-us/our-business/water-quality/water-quality-testing-and-reports

Appendix B – Water quality enquiry cluster investigation summary

Table 3 - Water quality enquiry cluster investigation summary 2017-2018

Event Number	Event Date	Trigger Description	Dirty / Milky	Taste / Odour	Health	Other	Investigation commentary	Corrective action undertaken
1132	03/07/2017	Any WQ Enquiry: 6 in 24 hours, all regions	11	2	0	0	Caboolture (Caboolture) | The result of 375mm TWM break	Reactive flushing undertaken
1133	07/08/2017	Health, Taste or Odour: 2 in 10 hours, single DMA	0	2	0	0	Maroochy North (Peregian Springs) | This Water Quality event was raised in error when a second Service Request (SR) was incorrectly raised off the first water quality complaint. This complaint was the result of MIB / Geosmin issues associated with the source water being supplied by Image Flat WTP	Reactive flushing undertaken
1134	27/09/2017	Health, Taste or Odour: 2 in 10 hours, single DMA	2	0	0	0	Pine North (Murrumba Downs) | Event incorrectly triggered / trigger failure. Dirty water complaints the result of planned works – water meter replacement	Reactive flushing undertaken
1135	28/09/2017	Health, Taste or Odour: 2 in 10 hours, single DMA	2	0	0	0	Maroochy South (Maroochydore) | Event incorrectly triggered / trigger failure. Dirty water complaints the result of planned works – water main connections	Reactive flushing undertaken
1136	28/09/2017	Health, Taste or Odour: 2 in 10 hours, single DMA	3	0	0	0	Maroochy South (Maroochydore) | Event incorrectly triggered / trigger failure. Dirty water complaints the result of planned works – water main connections	Reactive flushing undertaken
1137	04/10/2017	Any WQ Enquiry; 6 in 24 hours	9	0	0	0	Pine North (Griffin) | The result of network activity in the DMA (water carrier activity)	Reactive flushing undertaken
1138	16/10/2017	Any WQ Enquiry; 6 in 24 hours	19	0	0	0	Pine North (Kallangur) | The result of a 150mm AC water main break	Reactive flushing undertaken
1139	20/10/2017	Any WQ Enquiry; 6 in 24 hours	8	0	0	0	Caloundra (Kings Beach) x 1 | Internal issue Maroochy North (Marcoola) x 1 | Isolated incident in DMA; no planned or unplanned works in the DMA and no unusual pressure or flow trends Maroochy South (Maroochydore) x 5 | Suspected to be due to network activity associated with Maroochy CBD development Maroochy South (Buderim) x 1 | Isolated incident in DMA; no planned or unplanned works in the DMA and no unusual pressure or flow trends	No action required Reactive flushing undertaken Reactive flushing undertaken Reactive flushing undertaken
1140	23/02/2018	Any WQ Enquiry: 3 in 12 hours, single DMA	3	0	0	0	Pine South (Bray Park) | Cause unknown; no planned or unplanned works in the DMA and no unusual pressure or flow trends	Reactive flushing undertaken
1141	24/02/2018	Any WQ Enquiry: 4 in 24 hours, single DMA	4	0	0	0	Pine South (Ferny Hills) | Cause unknown; no planned or unplanned works in the DMA however pressure logger demonstrated unknown network activity	Reactive flushing undertaken
1142	21/03/2018	Any WQ Enquiry: 4 in 24 hours, single DMA	8	0	0	0	Pine North (Petrie) | The result of 400mm TWM break	Reactive flushing undertaken
1143	21/03/2018	Any WQ Enquiry: 6 in 24 hours, WQ Report	8	0	0	0	Pine North (Petrie) | The result of 400mm TWM break	Reactive flushing undertaken
1144	23/03/2018	Any WQ Enquiry: 3 in 12 hours, single DMA	3	0	0	0	Pine South (Albany Creek) | The result of a rezone required for an unplanned water outage – 150mm AC water main break – third party damage	Reactive flushing undertaken

1145	05/04/2018	Any WQ Enquiry: 4 in 24 hours, single DMA	5	0	1	0	Maroochy North (Nambour) | The result of a large inflow of soluble manganese into the Image Flat WTP that was unable to be processed by the biological filters	Reactive flushing undertaken
1146	05/04/2018	Any WQ Enquiry: 4 in 24 hours, single DMA	6	0	0	0	Maroochy North (Nambour & Burnside) | The result of a large inflow of soluble manganese into the Image Flat WTP that was unable to be processed by the biological filters	Reactive flushing undertaken
1147	05/04/2018	Any WQ Enquiry: 6 in 24 hours, WQ Report	12	1	1	0	Maroochy North (Nambour, Burnside & Coes Creek) | The result of a large inflow of soluble manganese into the Image Flat WTP that was unable to be processed by the biological filters	Reactive flushing undertaken
1148	05/04/2018	Any WQ Enquiry: 3 in 12 hours, single DMA	3	0	0	0	Maroochy North (Nambour & Burnside) | The result of a large inflow of soluble manganese into the Image Flat WTP that was unable to be processed by the biological filters	Reactive flushing undertaken
1149	27/04/2018	Any WQ Enquiry: 6 in 24 hours, WQ Report	5	1	0	0	Maroochy South (Buderim) x 4 | The result of a faulty level transmitter at the Orme Rd surge vessel causing the compressor run for a 24 hour period, pushing air into the main Maroochy South (Buderim) x 1 | The result of an unplanned water outage – repair to leaking ferrule Maroochy South (Buderim) x 1 (Taste) | No fault found	Reactive flushing undertaken Reactive flushing undertaken Disinfection residuals taken as part of reactive flushing
1150	27/04/2018	Any WQ Enquiry: 4 in 24 hours, single DMA	5	1	0	0	Maroochy South (Buderim) x 4 | The result of a faulty level transmitter at the Orme Rd surge vessel causing the compressor run for a 24 hour period, pushing air into the main Maroochy South (Buderim) x 1 | The result of an unplanned water outage – repair to leaking ferrule Maroochy South (Buderim) x 1 (Taste) | No fault found	Reactive flushing undertaken Reactive flushing undertaken Disinfection residuals taken as part of reactive flushing