QUEENSLAND UrbanUtilities

2017/18

DRINKING WATER QUALITY MANAGEMENT PLAN REPORT

ENRICH QUALITY OF LIFE

OUR PURPOSE

Enrich quality of life

OUR VISION

We will be recognised for our excellence in water and sewerage services that meet the evolving needs of our customers and enhance our communities

OUR VALUES

PARTICIPATION

Activate. Collaborate. Accelerate.

CUSTOMERS AND COMMUNITY

Listen. Understand. Respond.

ACCOUNTABILITY

See it. Own it. Solve it.

SAFETY

Everyone. Everywhere. Every day.

DELIVER VALUE

Define it. Create it. Deliver it.

CREATIVITY

Initiate. Create. Inspire.

WELCOME

We are pleased to present Queensland Urban Utilities' Drinking Water Quality Management Plan Report for 2017/18.

It showcases our operational performance with respect to drinking water quality, and shows how we have been implementing key improvement actions detailed in our *Drinking Water Quality Management Plan* (DWQMP).

This report also provides our customers with information about the quality of their drinking water.

This report informs the regulator on how we complied with our DWQMP and its approval conditions. It also allows us to meet our legislative obligations under the *Water Supply (Safety and Reliability) Act 2008*.

READERSHIP

The annual report is intended to provide important information to a broad range of stakeholders including: our customers, current and future employees, our shareholders, government departments and agencies, non-government organisations, and our partners.

ACCESSING THIS REPORT

This report is available on our website: urbanutilities.com.au/about-us/corporate-information/performance-reports

INTERPRETER SERVICE STATEMENT

We are committed to providing accessible services to our customers and stakeholders from culturally and linguistically diverse backgrounds. If you have difficulty in understanding the annual report, please contact us on 13 14 50 and we will arrange an interpreter to communicate the report to you effectively.

Interpreter

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اتصل على الرقم 13 14 50 عندما تكون بحاجة إلى مترجم فوري.
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ACKNOWLEDGEMENT

We acknowledge the Traditional Owners of the lands on which we operate and recognise their continuing connection to land, waters and community. We pay our respects to them and their cultures, and to elders both past and present.

CONTENTS

2017/18 IN REVIEW

128,200ML WATER DELIVERED THROUGH 9,391KM OF WATER MAINS

109 IN-SERVICE RESERVOIRS, 61 WATER PUMP STATIONS AND 85 WATER BOOSTERS

17 INCIDENT NOTIFICATIONS OF THE 113,000 WATER QUALITY TESTS, 17 SAMPLE RESULTS REQUIRED REPORTING TO THE REGULATOR.

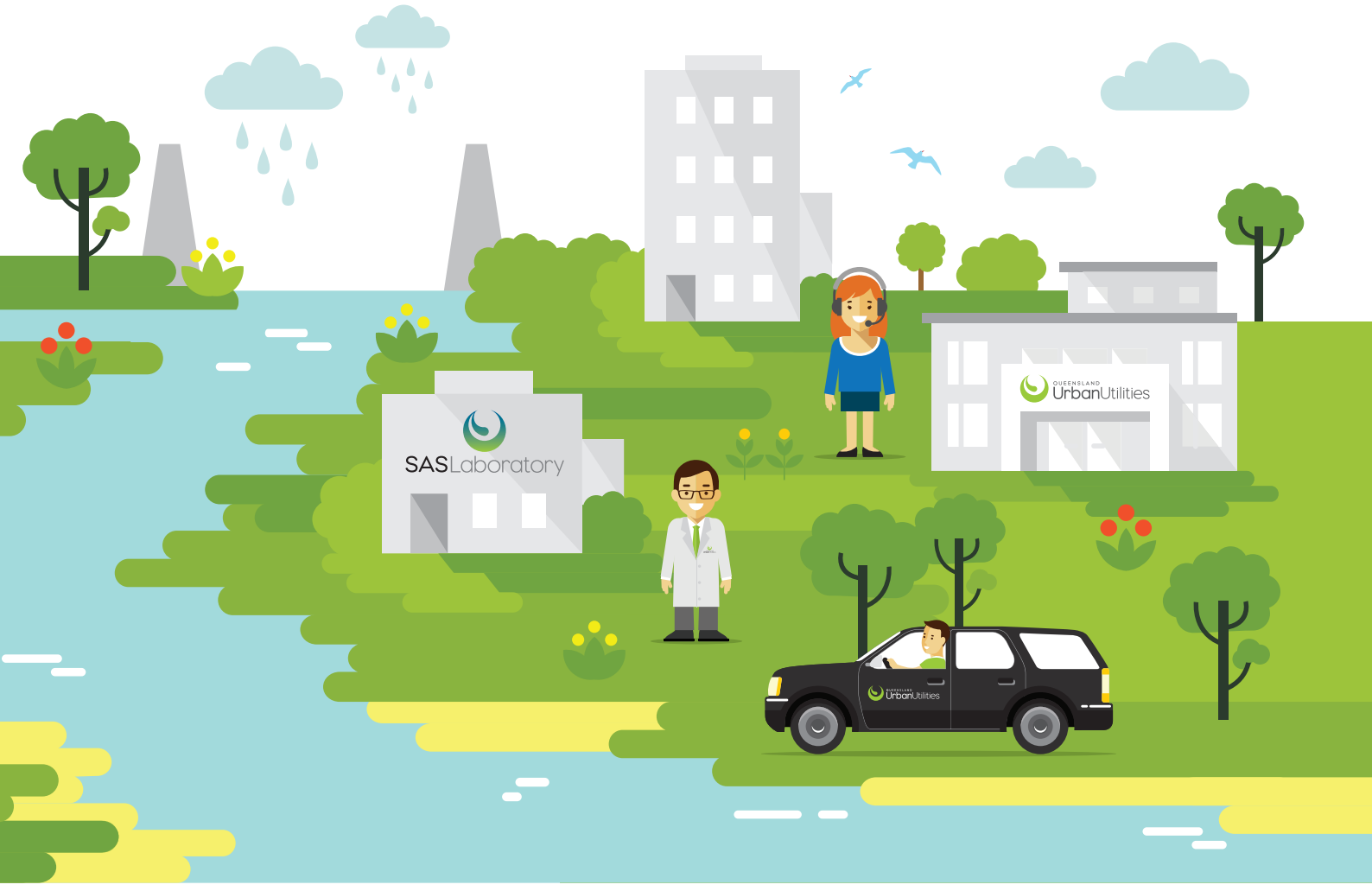
(see page 18)

113,000 WATER QUALITY TESTS CONDUCTED – INCLUDES SAMPLES FOR HEALTH-RELATED COMPLIANCE.

(see page 16)

39,738ML TO 36,837 NON-RESIDENTIAL PROPERTIES

88,462ML TO 576,652 RESIDENTIAL PROPERTIES



ACHIEVED 100% COMPLIANCE WITH THE AUSTRALIAN DRINKING WATER GUIDELINES (ADWG) HEALTH-RELATED PARAMETERS.
ACHIEVED 100% COMPLIANCE WITH THE AUSTRALIAN DRINKING WATER GUIDELINES (ADWG) CHEMICAL-RELATED PARAMETERS.
ACHIEVED 100% COMPLIANCE WITH THE AUSTRALIAN DRINKING WATER GUIDELINES (ADWG) AESTHETIC-RELATED PARAMETERS.

(see page 17)

CHAPTER 1: ABOUT US

WHO WE ARE

On 1 July 2010, Queensland Urban Utilities was established as a statutory body under the *South East Queensland Water (Distribution and Retail Restructuring) Act 2009*, and a service provider (SPID 521) under the *Water Supply (Safety and Reliability) Act 2008*. Our shareholders are the councils of Brisbane, Ipswich, Lockyer Valley, Scenic Rim, and Somerset, and we are governed by an independent Board.

WHAT WE DO

We are responsible for delivering drinking water, recycled water and sewerage services to over 1.4 million customers in South East Queensland. Our 14,384km^2 geographic area is made up of the five local government areas of our shareholders: Brisbane, Ipswich, Lockyer Valley, Scenic Rim and Somerset, and equates to around two-thirds of South East Queensland. We operate in a unique environment where we serve the same customers and communities as our shareholders.

We provide our services through the management of an extensive water and sewerage network, including:

- 18,916km of pipeline,
- 146 water pump stations & boosters,
- 333 sewage pump stations,
- 109 water reservoirs, and
- 29 sewage treatment plants.

OUR STRATEGIC DIRECTION

As detailed in our *2017-22 Corporate Plan*, our strategic direction outlines where we want to be and how we plan to get there.

Our purpose

Enrich quality of life.

Our vision

We will be recognised for our excellence in water and sewerage services that meet the evolving needs of our customers and enhance our communities.

Our strategic pillars

Our strategic pillars enable us to focus our day-to-day activities and strategic priorities to ensure we are on track to achieve our purpose and vision.

Pillar 1: Customers and Communities

We are easy to deal with, understand our customers and communities, and deliver services that meet their evolving needs.

Pillar 2: Shareholders and Strategic Stakeholders

We partner with our shareholders and strategic stakeholders to achieve mutually beneficial outcomes for our shared customers and communities.

Pillar 3: Operational Excellence

Through innovation and a constant drive to work more effectively and efficiently, we provide services that meet the evolving needs of our customers and communities.

Pillar 4: People

We are safe, adaptable and capable, and committed to living our values and achieving our purpose and vision.

OUR KEY PARTNERS

Our key partners in the South East Queensland water and sewerage industry are shown in Figure 1.

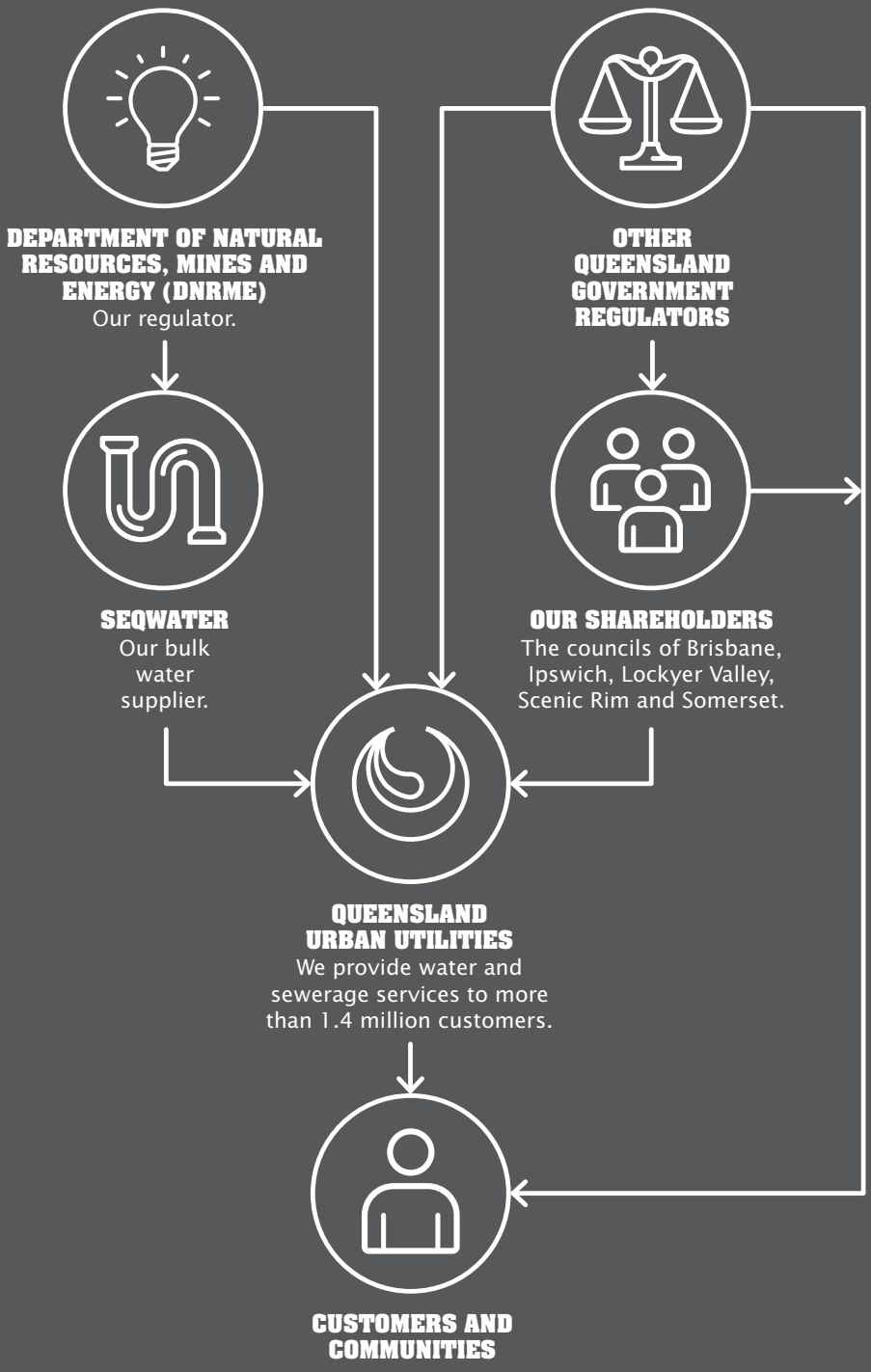


Figure 1: Our key partners.

CHAPTER 2: DELIVERING WATER TO OUR CUSTOMERS


SOMERSET
BRISBANE
LOCKYER VALLEY
IPSWICH
SCENIC RIM

CHAPTER 2: DELIVERING WATER TO OUR CUSTOMERS

SOURCING DRINKING WATER

The drinking water supplied by Queensland Urban Utilities to its customers is sourced from Seqwater, a Queensland Government statutory authority responsible for the catchment, storage, transportation and treatment of bulk drinking water. Queensland Urban Utilities buys treated bulk drinking water from Seqwater, and distributes this water to our customers in each of these local government areas – Brisbane, Ipswich, Lockyer Valley, Scenic Rim and Somerset.

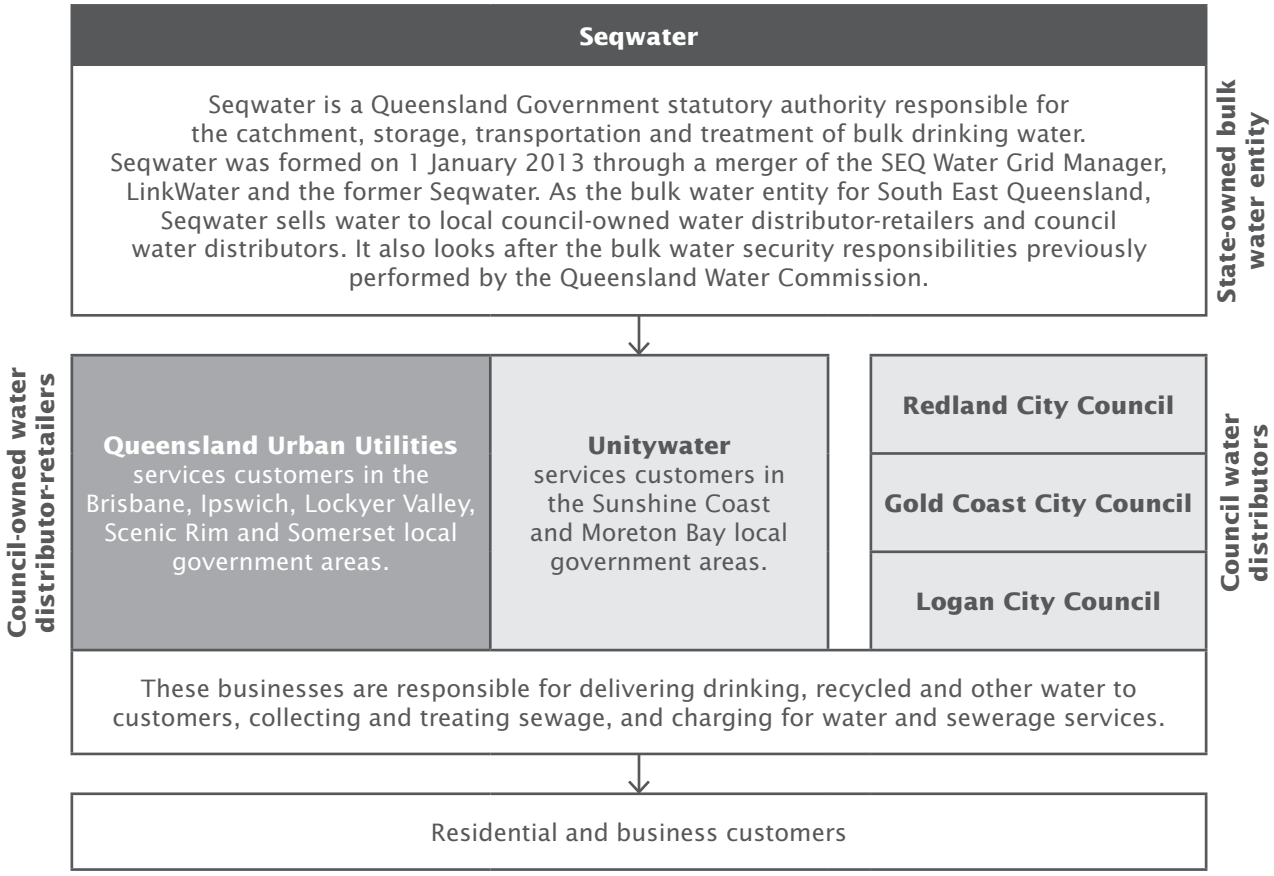


Figure 2: Queensland Urban Utilities' relationship with Seqwater.

DELIVERING DRINKING WATER

Queensland Urban Utilities provides drinking water services to 1.4 million people residing within its 14,384km^2 service territory, which stretches from Cape Moreton in the east to the foot of the Toowoomba Range in the west, and from the Yabba State Forest in the north to the New South Wales border in the south.

Within our five local government areas, we provide water services through 12 water supply schemes:

1. Beaudesert,
2. Boonah – Kalbar also servicing localities extending out to Mt Alford and Aratula,
3. Canungra,
4. Esk – Toogoolawah,
5. Jimna,
6. Kilcoy,
7. Kooralbyn,
8. Linville,
9. Lowood – servicing townships in the Lockyer Valley and Somerset regions of Tarampa, Minden, Prenzlau, Coolana, Lowood, Vernor and Fernvale.
10. Rathdowney,
11. Somerset Township, and
12. South East Queensland (Brisbane and Ipswich) Water Supply System (SEQWSS) including the Scenic Rim townships of Peak Crossing, Harrisville and Warrill View.

These schemes begin at the bulk supply points and reservoirs operated and owned by Seqwater and end at the customer's water meter. Figure 2 (see page 12) shows our water supply schemes across the local government areas.

Our largest water supply scheme, the South East Queensland Water Supply Scheme, services Brisbane and Ipswich, and makes up around 89% of the total water supply network. Schemes in the Lockyer Valley, Scenic Rim and Somerset make up the remaining 11%.

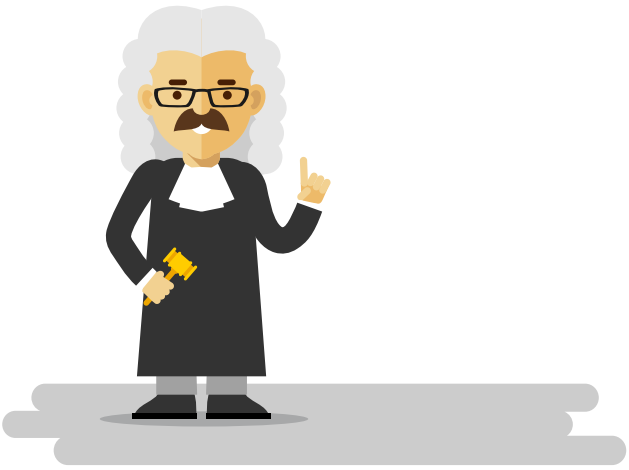
CHAPTER 3: MANAGING SAFE DRINKING WATER

LEGISLATIVE REQUIREMENTS

The supply of safe and reliable drinking water in Queensland is regulated by various pieces of state legislation, including the *Water Supply (Safety and Reliability) Act 2008*, the *South-East Queensland Water (Distribution and Retail Restructuring) Act 2009*, and the *Public Health Act 2005*.

Under the *Water Supply (Safety and Reliability) Act 2008*, a drinking water service provider may only carry out a registered drinking water service in accordance with an approved Drinking Water Quality Management Plan (DWQMP). In 2017, we undertook a comprehensive review of the existing DWQMP and conducted full risk assessments of our 12 water supply schemes. As a result of the review, a DWQMP amendment was submitted to the Regulator for approval in January 2018. The Regulator approved the revised DWQMP on 19 March 2018. The revised DWQMP follows industry best practice in that all water quality hazards have been identified, risk assessed, and where necessary improvements have been committed to. Some of our key future improvement areas are outlined in Chapter 5.

Under the *Public Health Act 2005*, Queensland Health (QHealth) regulates the standards for drinking water quality related to *E. coli* and fluoride. These standards, together with the health guideline levels in the *Australian Drinking Water Guidelines 2011* (ADWG), have been incorporated under the *Water Supply (Safety and Reliability) Act 2008* as water quality criteria for drinking water in Queensland.



OUR APPROACH TO MANAGING DRINKING WATER QUALITY

Our approach to managing drinking water quality is through our Drinking Water Quality Management System (DWQMS), which is based on the ADWG *Framework for Management of Drinking Water Quality*. There are 12 elements within the framework:

Organisational commitment
1. Commitment to water quality management

System Analysis and Management
2. Assessment of the water supply system
3. Preventative measures
4. Operational procedures and process control
5. Verification of water quality
6. Management of incidents and emergencies

Supporting requirements
7. Employee awareness and training
8. Community involvement and awareness
9. Research and development
10. Documentation and reporting

Review
11. Evaluation and audit
12. Review and continual improvement

Our *Drinking Water Quality Policy* underpins our commitment to the effective management of drinking water and the associated distribution system, to provide responsible, safe and sustainable drinking water that meets the evolving needs of our customers, shareholders and communities.

CHAPTER 3: MANAGING SAFE DRINKING WATER

VERIFICATION MONITORING PROGRAM

Queensland Urban Utilities uses the drinking water quality verification monitoring program (VMP) as the final assessment of the preventative measures and control barriers put in place to protect the safety of drinking water.

In 2017/18, we collected over 9,300 samples from over 310 dedicated drinking water sample points. These samples, and subsequent testing, verify the water we deliver to the community is safe to drink.

Through our Scientific Analytical Services, we conducted in excess of 113,000 tests and scrutinised the results against the requirements as prescribed in the legislation and Australian Drinking Water Guidelines (ADWG). The data also provided insight into operational performance and drives optimisation.

In 2017/18, we continued to implement our rolling sample point replacement program, and also installed additional water quality sampling points across our water networks. This program of work is a demonstration of our commitment to continuous improvement. The additional locations enrich our knowledge of the water networks, and will contribute to operational excellence and enhanced customer outcomes. We remained committed to developing our verification monitoring program and will install additional sample points in 2018/19.

The monitoring program is complex in nature. To ensure we remain compliant a quarterly audit of the program is conducted by an external party. Feedback in 2017/18 demonstrates that the many variables associated with water quality management are well controlled, and our performance is near perfect.

Escherichia coli (E. coli)

We continued to achieve excellent health performance in 2017/18, with 100% of drinking water schemes complying with legislative *E. coli* requirements.

The standard for drinking water in Queensland requires no detection of *E. coli* in 98% of samples collected over a 12 month period. The minimum number of samples required to be taken is detailed in the Queensland *Public Health Regulation 2005 Schedule 3A*.

E. coli water quality compliance details are provided in Appendix B, including the month-by-month performance.

Health-related chemical assessment

All of our drinking water schemes complied with the health-related chemical limit values defined in the ADWG.

We use a risk management approach to drinking water quality which allows us to identify the substances that may pose a risk to public health. The verification monitoring program analyses these substances which are continuously trended and assessed against ADWG health-related limits and operational control triggers. All our drinking water schemes comply with the health-related limits described in the ADWG using the 95th percentile (95th-%ile) calculation.

Health assessment water quality compliance details are provided in Appendix B.

Aesthetic assessment

Our routine verification monitoring program is important for us to verify we provide safe drinking water to our customers. We take advantage of the program to continuously assess non-health related parameters which contribute to the way our water tastes, smells and appears. We understand these physical aspects of drinking water are important in enriching the quality of life. In 2017/18, all drinking water schemes performed within the aesthetic guideline values as detailed in the ADWG.

Aesthetic assessment water quality compliance details are provided in Appendix C.

Table 1 summarises how our drinking water schemes performed over 1 July 2017 to 30 June 2018, against the legislative requirements, detailed above.

Overall assessment

For 2017/18, Queensland Urban Utilities met the prescribed health-related and aesthetic standards for all 12 drinking water schemes (see Table 1).

Overall			
Scheme	***E. coli***	**Health**	**Aesthetic**
Beaudesert	☑	☑	☑
Boonah-Kalbar	☑	☑	☑
Canungra	☑	☑	☑
Esk-Toogoolawah	☑	☑	☑
Jimna	☑	☑	☑
Kilcoy	☑	☑	☑
Kooralbyn	☑	☑	☑
Linville	☑	☑	☑
Lowood	☑	☑	☑
Rathdowney	☑	☑	☑
Somerset	☑	☑	☑
SEQ Water Supply Scheme	☑	☑	☑

Table 1: Drinking water supply scheme results 1 July 2017 – 30 June 2018.

CHAPTER 4: NOTIFYING THE REGULATOR

Under sections 102 and 102A of the *Water Supply (Safety and Reliability) Act 2008*, Queensland Urban Utilities is required to immediately inform the Regulator if the quality of water supplied from the drinking water service does not comply with the water quality criteria as specified in the ADWG.

Our water quality incidents represent the number of times a water quality sample does not meet the ADWG parameters, resulting in the immediate reporting of the incident to the Regulator.

In 2017/18, QUU took over 9,300 water samples and conducted 113,000 water quality tests. Of those samples, 17 tests did not meet the requirements of the ADWG requiring us to report these as incidents to the Regulator.

Of the 17 notifications, 14 involved the detection of *E. coli* in the SEQWSS, which can be attributed to structural issues with the roof of some of our reservoirs, allowing organic matter to enter the water supply, and warm weather with corresponding reduction of disinfection residuals in the network. Follow up samples exhibited no continued presence of *E. coli*. The remaining three notifications were related to the detection of total Trihalomethanes (tTHMs), exceeding ADWG health limits, in regional areas which can be related to the level of organic matter in the Seqwater raw water source supply.

On each occasion the investigation of the incident found there was no risk to public health (see Figures 5 and 6, page 19).

For details on how we managed these incidents refer to *Chapter 7 – Water quality performance by region*.

Notifications to the Regulator

E. coli (14)

tTHMs (3)

Local government area	*E. coli*	Chemical
Brisbane	8	0
Ipswich	4	0
Lockyer Valley	0	0
Scenic Rim	1	1
Somerset	1	2
TOTAL	**14**	**3**

Figure 5: Queensland Urban Utilities' notifications to the Regulator 2017/18.

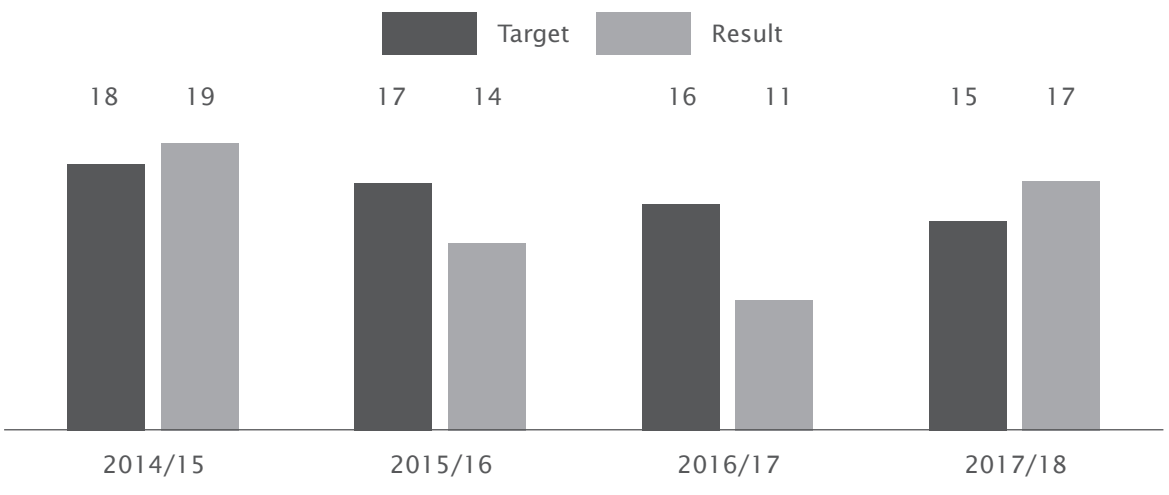


Figure 6: Queensland Urban Utilities' notifications to the Regulator 2014/15 to 2017/18.

CHAPTER 5: IMPROVING DRINKING WATER QUALITY

Queensland Urban Utilities is committed to enriching quality of life through continual improvement and innovation in the management of our drinking water supply so that we provide our customers with a safe, high-quality and reliable product.

Reservoir water safety improvement program

In 2017/18, Queensland Urban Utilities completed a further 18 reservoir water safety improvements projects. This rolling program identifies asset upgrades to improve reservoir water quality. The assessment completed for all in-service reservoirs in 2016/17 was based on guiding principles that targeted key risks (external and internal) for reservoirs, such as stormwater roof run-off. The assessment also incorporated historical water quality operational data and network water age from previous water quality modelling studies.

This targeted continuous improvements program focuses on an outcome based, 'water tightness' approach to all reservoir roof-related improvement works that were completed. This approach incorporates Queensland Urban Utilities innovative roof flood testing procedure so that we capture performance before and after works are completed to ensure the safety of the stored water.

Water quality capital improvements program

Queensland Urban Utilities continues to invest in upgrades of our assets to ensure the quality and safety of our drinking water. In 2017/18, this program of works included the rehabilitation of seven reservoirs, including installation of new reservoir roofs, and refurbishment of floor and wall joints.

Our capital program also renewed a further 22km of water mains in 2017/18. This program aims to reduce the likelihood of disruptions to our customers' water service by improving the reliability and efficiency of our water supply, whilst providing the associated benefit of a reduced risk to water quality.

Water quality performance monitoring improvement

Queensland Urban Utilities has increased its fleet of water quality field devices throughout our water supply network to continuously monitor our disinfection. These devices provide instant information on the quality of our disinfection which allows us to respond quickly to any changes in our disinfection quality and initiate remedial actions. These field devices are easy to relocate, which has allowed us to investigate any changes and implement optimal solutions to improve the disinfection.

Sample point replacement program

In 2017/18, as part of our routine VMP, we collected over 9,300 drinking water samples from over 310 dedicated water quality monitoring sample points throughout our network to ensure we verify the safety of our drinking water supply to our customers. As part of our commitment to continuous improvement of our system, we have implemented a rolling sample point replacement program to standardise and upgrade the infrastructure used in monitoring our drinking water supply.

Collaborating to optimise the South East Queensland water supply system

In 2017/18, we continued to collaborate with the other South East Queensland water supply partners to produce a regionally-endorsed asset investment strategy that outlines a set of actions to optimise how we disinfect the water across the SEQ region. The objectives are to maintain public health and optimise operational efficiencies.

In addition, the SEQ Water Quality Partnership undertook a regional water quality assessment of key measures to assist in improving the understanding, efficiency, and quality of the long-term service to the region's drinking water customers. The SEQ Partnership aims to provide an overarching framework for the integrated management of drinking water quality from catchment-to-customer, delivering value for the community.

Furthemore, public health performance targets agreed within the recently endorsed *SEQ Partnership Drinking Water Quality Management Plan* were further expanded and progressed. The catchment-to-tap based water quality best practice approach outlined in the plan provides a cross-organisational risk management framework across the entire South East Queensland water supply system.

Keeping abreast of emerging water quality issues

Queensland Urban Utilities uses innovation as a catalyst to adapt to changes in our environment, enabling us to deliver water services that meet our customers' evolving needs.

A program of investigative studies has now been established, which target focus areas in regard to water quality monitoring, dosing and enhanced product and reliability. The program includes:

- conducting systematic reviews of baseline monitoring data to identify emerging issues and trends and to assist in determining priorities for improving drinking water quality,
- undertaking sampling and chemical analysis,
- undertaking water age and water quality modelling to deliver cost effective infrastructure for water quality improvements,
- investigating water quality issues to improve understanding of the loss of chlorine residual during disinfection using chloramination, and
- developing strategic partnerships, networks and collaborations with research providers such as Water Services Association Australia (WSAA), Australian Universities, Water Research Australia, Water Environment Research Foundation (WERF), American Water Works Association Research Foundation (AWWARF), and WaterStart (a Nevada-based cluster of global leaders in the implementation of water innovation).

CHAPTER 6: CUSTOMER SATISFACTION

Queensland Urban Utilities recognises the value of community engagement in building trust in our brand and the delivery of service excellence. We value customer feedback as it enables us to continuously improve our services. This commitment is a key component of our continued pursuit of innovative ways of doing business, and our transformation into a customer centric organisation.

We recognise that customers or members of the community may need to provide feedback if a service or product fails to meet their expectations or our standards. This feedback is captured, recorded and monitored to help identify any trends and possible areas of improvement in the operation, maintenance and management of the Queensland Urban Utilities network.

While we receive various water quality enquiries throughout the year, a 'water quality complaint' is registered when a Queensland Urban Utilities water quality specialist is required to actively engage with a customer to determine if remedial action is required.

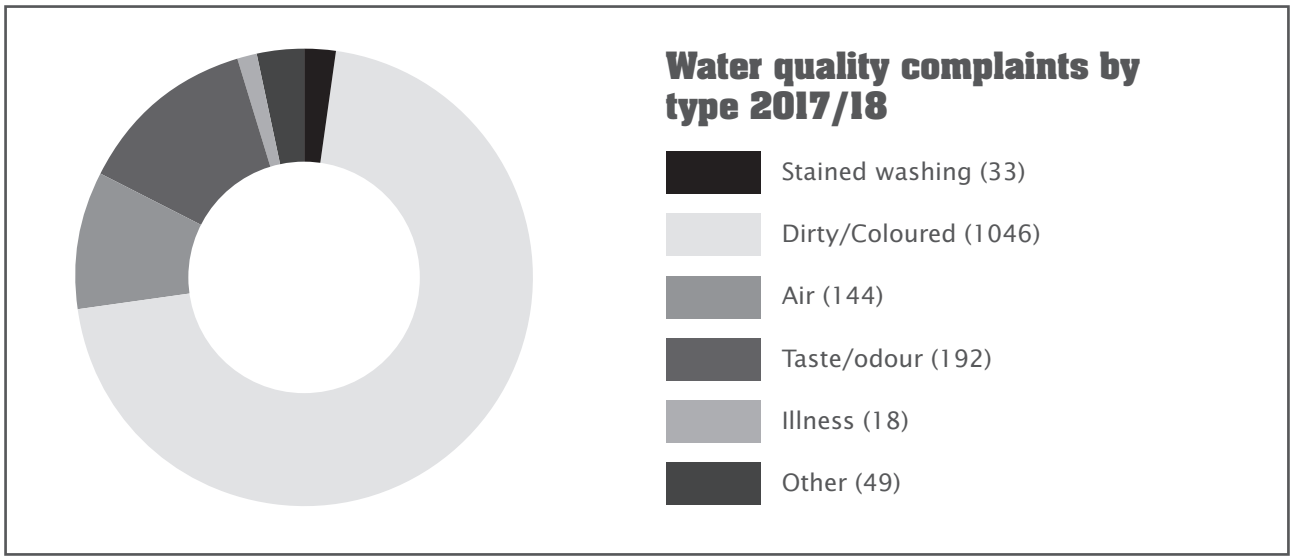
In 2017/18, Queensland Urban Utilities received 1,482 water quality complaints.

Of these complaints, 70% related to dirty/coloured water. These complaints usually followed maintenance activity on our water distribution network. The relevant areas were flushed to remove the dirty water, and customers who reported a complaint were advised of the reasons for the dirty water and were requested to allow the main a short period of time to settle.

A further 13% related to taste and odour complaints which can vary widely based on the customer's perception. The most common complaint descriptions included chlorine, metallic and chemical tastes. These were addressed by flushing the water main when warranted. Investigation of each complaint found no public health risks.

A small percentage of complaints were received from customers who suspected their water may be associated with an illness they were experiencing. Queensland Urban Utilities investigates each complaint related to alleged illness from our water quality, typically by testing the customer's tap and closest reticulation sampling point. During 2017/18, there were no confirmed cases of illness arising from the water supply system.

The breakdown of water quality complaints by type and region is shown in Figure 7.



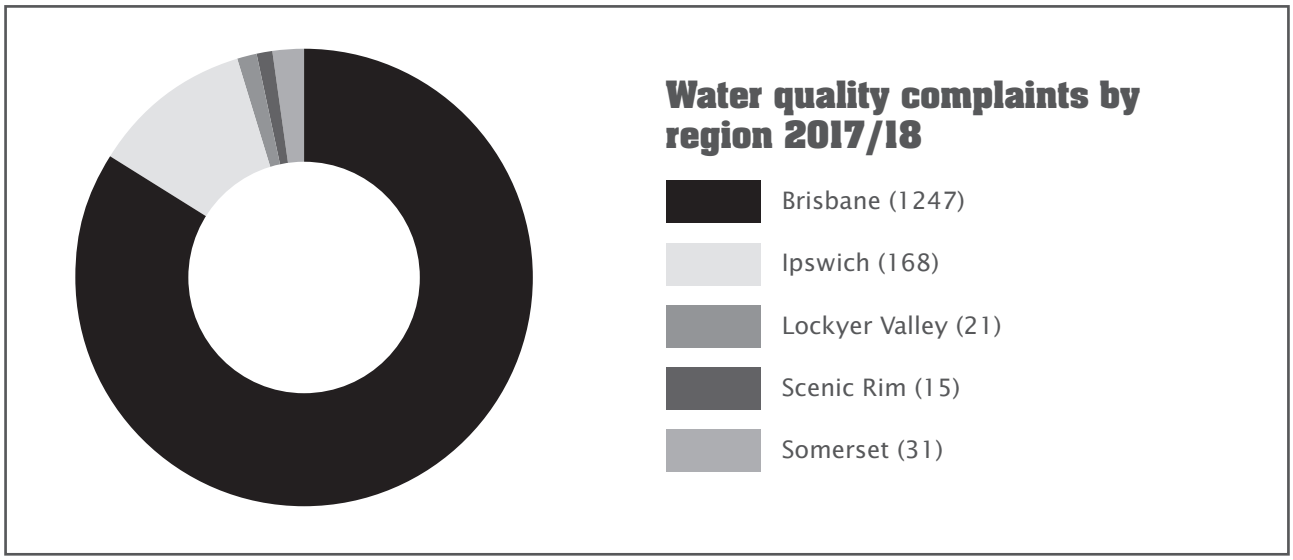


Figure 7: Water quality complaints by type and region – 2017/18.

CHAPTER 6: CUSTOMER SATISFACTION

Figure 8 shows Queensland Urban Utilities' performance against its service standards as published in the Residential and Business Customer Charters, and a comparison with comparable water service providers across Australia with similar complexities and risks relating to the supply of drinking water.

Our Customer Charters outline commitments, responsibilities and standards that our customers can expect from us in relation to the water we provide. In 2017/18, our service standard for water quality was less than or equal to six water quality complaints per 1,000 connected properties, per year. In 2017/18, we remained well under the customer service standard.

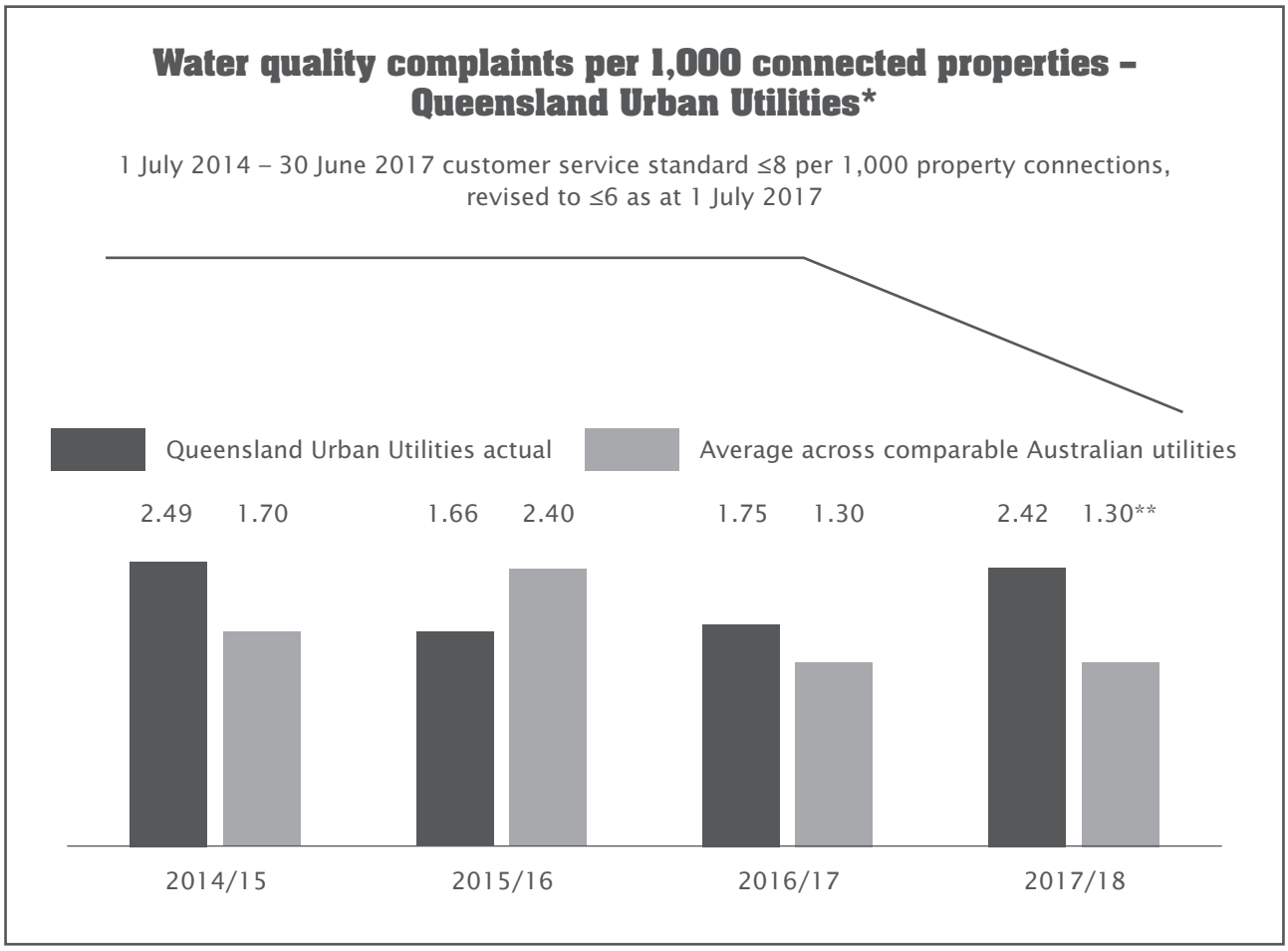


Figure 8: Water quality complaints per 1,000 property connections 1 July 2014 to 30 June 2018.

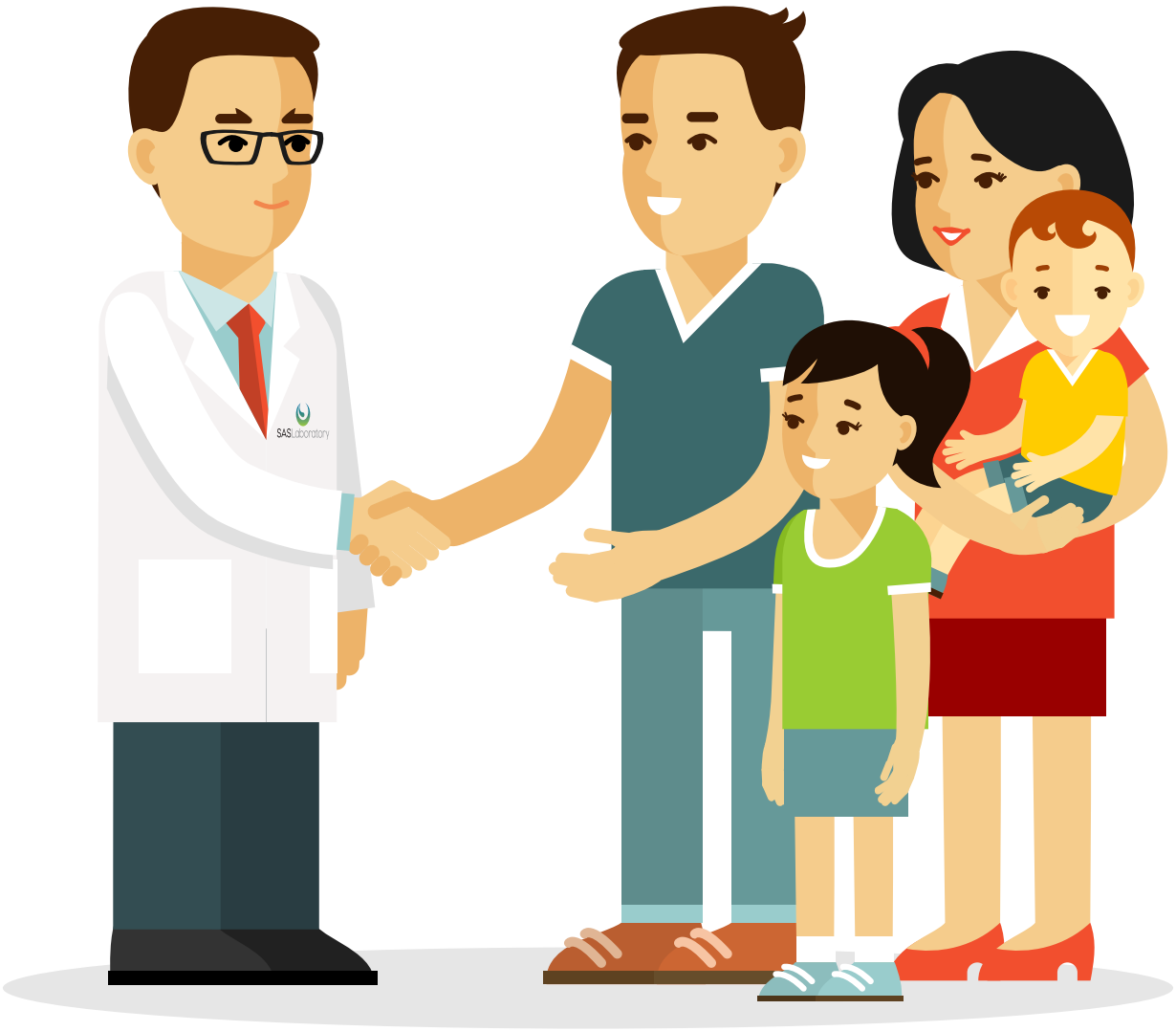
The increase in FY17/18 is largely attributable to responsive maintenance activities in the Brisbane region, which resulted in higher than normal water quality complaints (see page 29).

*The value for comparable Australian Utilities is sourced from the Bureau of Meteorology's *National performance report (NPR) 2016-17: urban water utilities*: Indicator Code C9 – water quality complaints, by utility size group (100,000+ size group).

** NPR data for 2017/18 is not yet available; as a result the NPR result for 2016/17 has been used.

Introducing a new reporting regime from 1 July 2018

From 1 July 2010 to 30 June 2018, Queensland Urban Utilities classified all water quality related enquiries from our customers as 'complaints'. This is inconsistent with the definition of a 'complaint' under the Australian/International Standard *10002-2006 Customer satisfaction – guidelines for complaints handling in organizations*. In 2018/19, we will be changing the way we classify and report water quality complaints to ensure alignment with the Australian Standard and consistency with other water utilities. While this change in reporting will see a decrease in the reported water quality complaints, it does not change our commitment to investigate instances where our service or product fails to meet customer expectations or our service standards. We value all customer feedback as it helps to identify any trends and possible areas of improvement in the operation, maintenance and management of the Queensland Urban Utilities water networks.



CHAPTER 7: WATER QUALITY PERFORMANCE BY REGION

BRISBANE REGION

The South East Queensland Water Supply Scheme supplies drinking water to our customers in Brisbane. Water supplied to Brisbane is provided mostly from Seqwater's Mount Crosby and North Pine WTPs. When required, the Seqwater Southern and Northern Regional Pipelines can supply water in both directions.

Notifications to the Regulator

Our water quality incidents represent the number of times a water quality sample does not meet the ADWG parameters, resulting in the immediate reporting of the incident to the Regulator. During 2017/18, eight incidents occurred in the Brisbane region which required advice to the Regulator. Table 2 summarises these notifications and how we responded to the event, with the diagram demonstrating performance over the last four years.

Date	Type	Location	Description	Preventative and corrective actions
27/12/2017	*E. coli*	Grovely	The non-compliance was a detection of *E. coli* from a routine sample taken on 27/12/17 at SP264. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	Several actions were carried out at this reservoir, including: ▪ reservoir roof enhancements, ▪ perimeter gutter core drilled to provide additional overflow drainage, ▪ reservoir was stress tested via roof flooding methodology as per AS3735 *Concrete structures for retaining liquids*, ▪ chlorine residuals monitored via continuous on-line analyser (medium term).
27/12/2017	*E. coli*	Manly	The non-compliance was a detection of *E. coli* from a routine sample taken on 27/12/17 at SP265. 5MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	Several actions were carried out at this reservoir, including: ▪ dry vacuum of reservoir, ▪ works to enhance reservoir roof integrity, ▪ removal of existing drain gate and replaced with modified, recessed gate, ▪ unused bolts removed and treated with epoxy where needed.

Date	Type	Location	Description	Preventative and corrective actions
18/01/2018	*E. coli*	Manly	The non-compliance was a detection of *E. coli* from a routine sample taken on 18/01/18 at SP265. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	This reservoir is temporarily off-line while upgrade words are carried out.
22/01/2018	*E. coli*	Bracken Ridge	The non-compliance was a detection of *E. coli* from a routine sample taken on 22/01/18 at SP370. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	This reservoir inlet now has a continuous water parameter analyser installed for accurate assessment of incoming source water and performance monitoring. Seqwater is addressing disinfection in the bulk water supply network with the installation of a disinfection boosting station at Aspley reservoir due for completion in 2018. This is expected to improve the consistency of disinfection received by this reservoir. Further reservoir enhancements are being investigated.
6/02/2018	*E. coli*	Grovely	The non-compliance was a detection of *E. coli* from a routine sample taken on 6/2/18 at SP79. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	This reservoir is temporarily off-line until roof and gutter modifications have been completed.

CHAPTER 7: WATER QUALITY PERFORMANCE BY REGION

Date	Type	Location	Description	Preventative and corrective actions
20/02/2018	*E. coli*	Chapel Hill	The non-compliance was a detection of *E. coli* from a routine sample taken on 20/2/18 at SP226. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	This reservoir is temporarily off-line until roof modifications have been completed.
6/03/2018	*E. coli*	Green Hill	The non-compliance was a detection of *E. coli* from a routine sample taken on 6/3/18 at SP66. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	The sample point was found to not meet QUU's standard sample point specification. It is likely the sample was contaminated due to extreme rain conditions fouling the sample point and sample collection process. The sample point is no longer in use.
17/05/2018	*E. coli*	Milne Hill	The non-compliance was a detection of *E. coli* from a routine sample taken on 17/5/18 at SP186. 4MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	An inline chlorine analyser has been installed on the outlet. Seqwater is addressing disinfection in the bulk water supply network with the installation of a disinfection boosting station at Aspley reservoir due for completion in 2018. This project will improve disinfection in Aspley reservoir and therefore improve disinfection at Milne Hill. QUU will continue to monitor water quality and perform routine reservoir inspections.

Table 2: Notifications to the Regulator – Brisbane: 1 July 2017 – 30 June 2018.

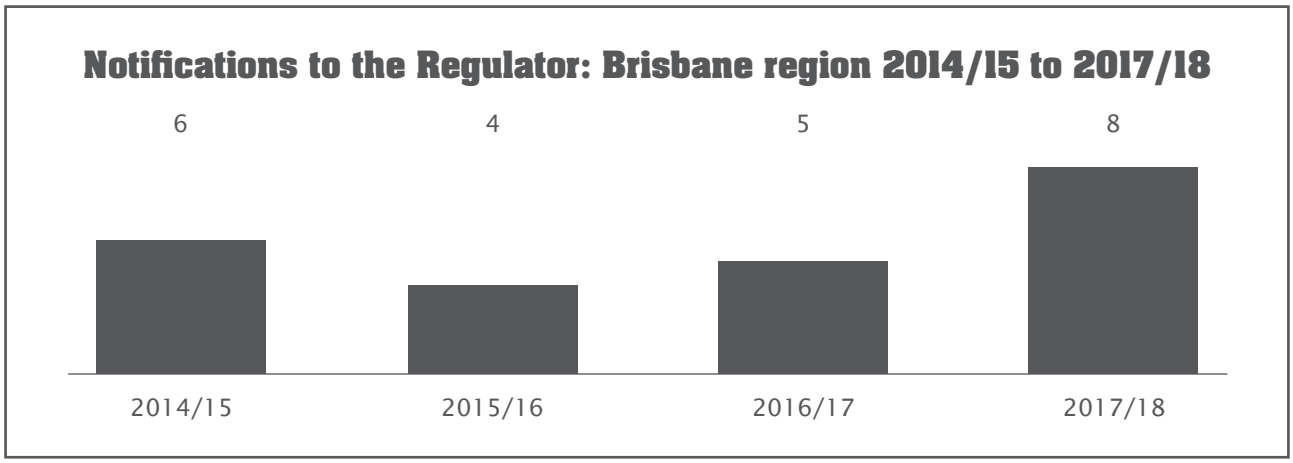


Figure 9: Notifications to the Regulator – Brisbane: 1 July 2014 to 30 June 2018.

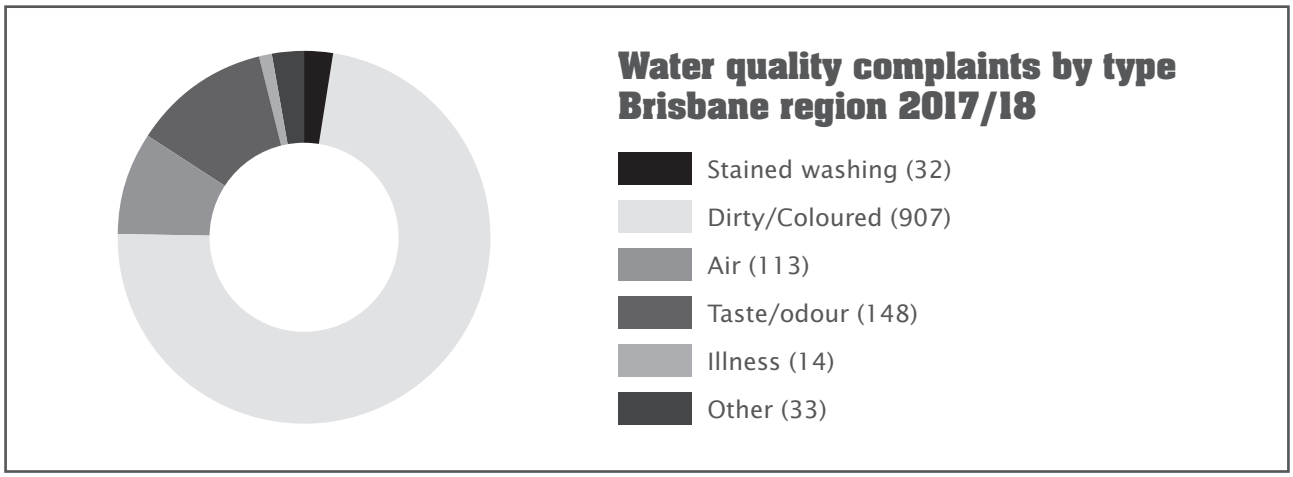
Customer satisfaction

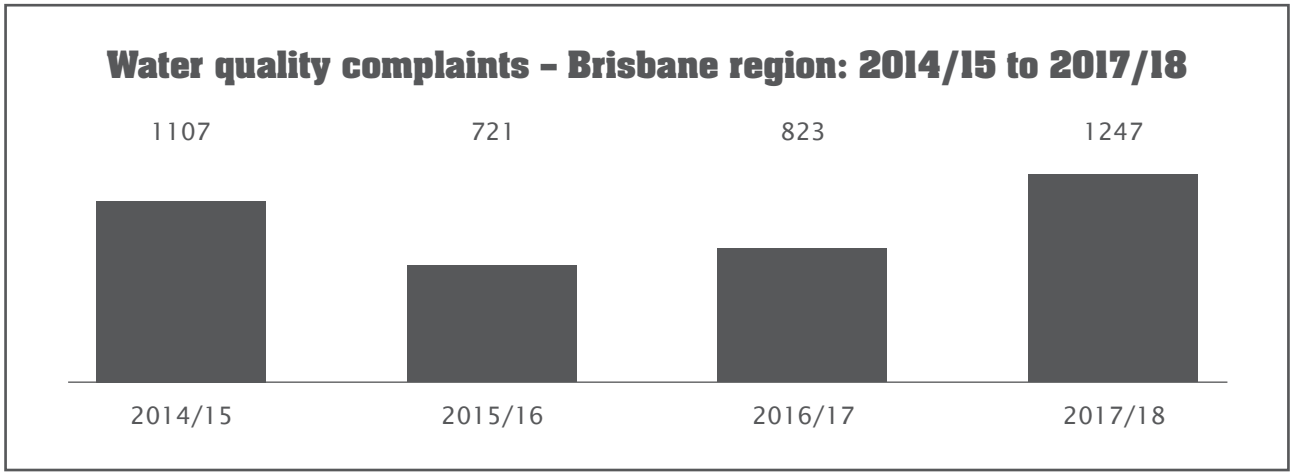
In 2017/18, Queensland Urban Utilities investigated 1,247 water quality complaints in the Brisbane region which accounts for 84% of total water quality complaints. The 2017/18 result is a 52% increase on the number of water quality complaints received in 2016/17. This increase, and the fact that Brisbane accounted for the majority of complaints can be associated with network events in the latter part of 2017.

In September 2017, the leak on a 1370mm trunk water main located in Tarragindi (which services approximately 68,000 customers over 23 suburbs) resulted in higher than normal dirty water complaints. In November 2017, network activities within the suburbs of Spring Hill, Graceville, Sherwood, Oxley and Inala also resulted in a higher than expected number of water quality complaints related to dirty water. In both scenarios, the activity of the network was in response to emergency works to maintain customer supply. At no time did our customers experience water supply loss, and there was no detrimental impact on the integrity of the water supply.

Despite this increase in water quality complaints, Queensland Urban Utilities remained well under the customer service standard of ≤6 complaints per 1,000 property connections.

CHAPTER 7: WATER QUALITY PERFORMANCE BY REGION





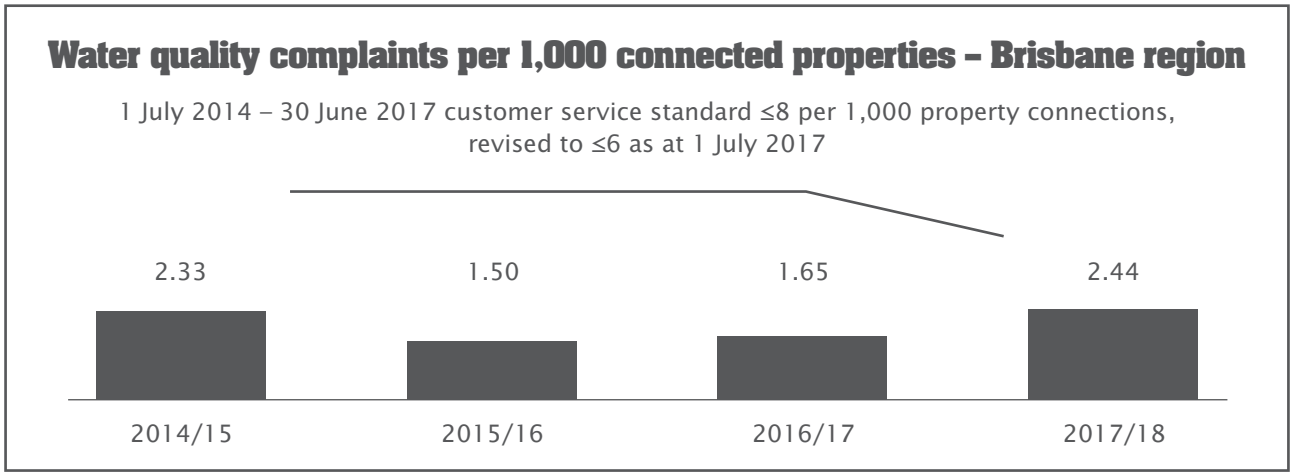


Figure 10: Customer satisfaction – Brisbane region.

IPSWICH REGION

The South East Queensland Water Supply Scheme supplies drinking water to our customers in Ipswich[2]. Water supplied to Ipswich is provided from the Seqwater Mount Crosby WTP, and via the Southern Regional Water Pipeline.

Notifications to the Regulator

Our water quality incidents represent the number of times a water quality sample does not meet the ADWG parameters, resulting in the immediate reporting of the incident to the Regulator. During 2017/18, four incidents occurred in the Ipswich region which required advice to the Regulator. Table 3 summarises these notifications and how we responded to the event, with the diagram demonstrating performance over the last four years.

Date	Type	Location	Description	Preventative and corrective actions
12/10/2017	*E. coli*	Deebing Heights	The non-compliance was a detection of *E. coli* from a routine sample taken on 12/10/17 at SP416. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	Chlorine dosing was improved and the Ripley high level zone (HLZ) was flushed until chlorine concentrations where observed in the network at sample points and hydrant locations. Responsive sampling from the sample point confirmed the absence of *E. coli*. In addition, potential points of contaminant ingress were addressed.
23/11/2017	*E. coli*	Blackstone	The non-compliance was a detection of *E. coli* from a routine sample taken on 12/10/17 at SP416. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	The Jones Street reservoir was isolated and supply was directed from the adjoining Whitehead Street reservoir supply zone. The reservoir roof has had all aluminium roof sheets realigned, sheet laps sealed with mastic, fixings replaced and anchored correctly, eaves have been made waterproof and flashing replaced. The reservoir was cleaned, disinfected and tested for water quality before resumption of supply.

[2] The South East Queensland Water Supply Scheme also supplies drinking water to our customers in Brisbane, as well as those in Peak Crossing, Harrisville and Warrill View in the Scenic Rim.

CHAPTER 7: WATER QUALITY PERFORMANCE BY REGION

Date	Type	Location	Description	Preventative and corrective actions
2/01/2018	*E. coli*	Riverview	The non-compliance was a detection of *E. coli* from a routine sample taken on 27/12/17 at SP64. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	The reservoir roof sheet overlaps will continue to be assessed during routine reservoir inspections. In 2018/19, sample points will be installed on the inlet and outlet mains. These sample points will have continuous on-line chlorine monitoring installed.
3/01/2018	*E. coli*	Outlook	The non-compliance was a detection of *E. coli* from a routine sample taken on 27/12/17 at SP65. 5MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	The reservoir was isolated, disinfected and water quality tested before being returned to service. A temporary disinfection management devices has been installed, and the reservoir roof is to be replaced during 2019/20.

Table 3: Notifications to the Regulator – Ipswich: 1 July 2017 – 30 June 2018.

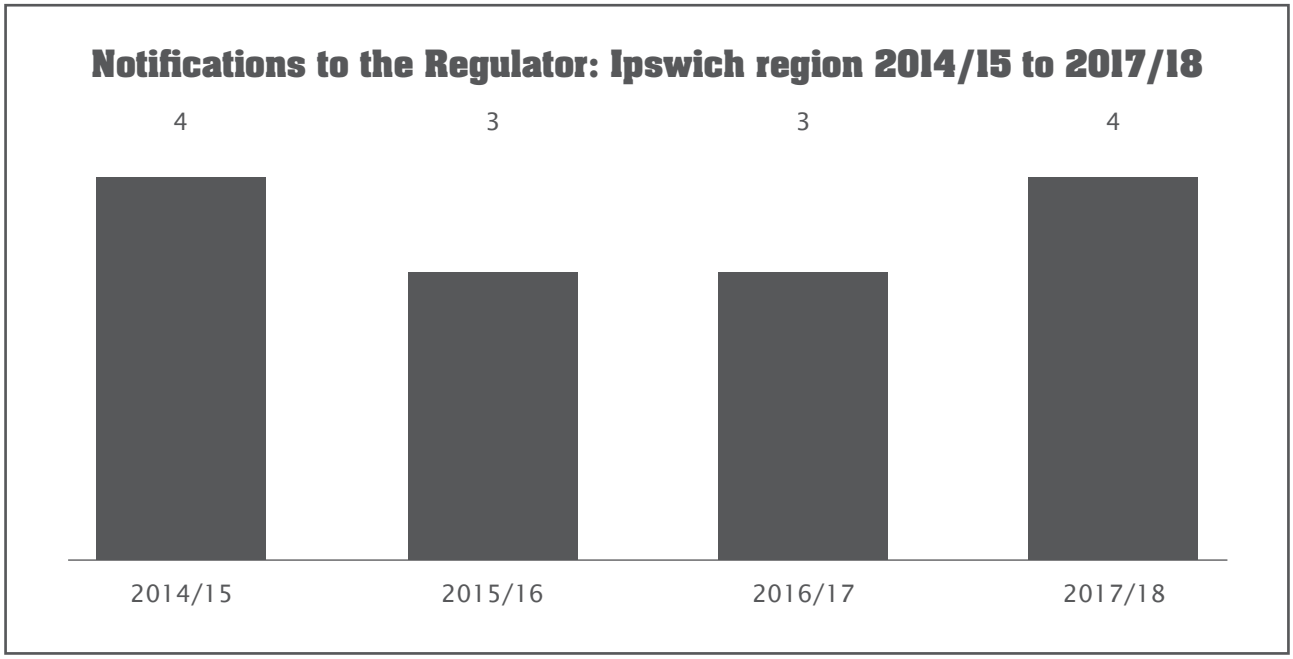
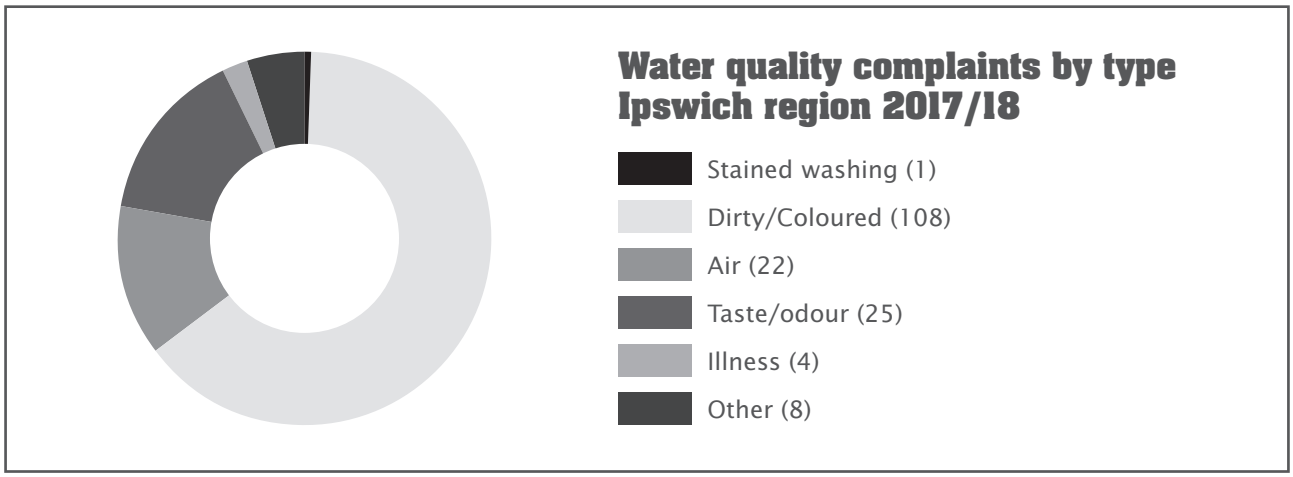
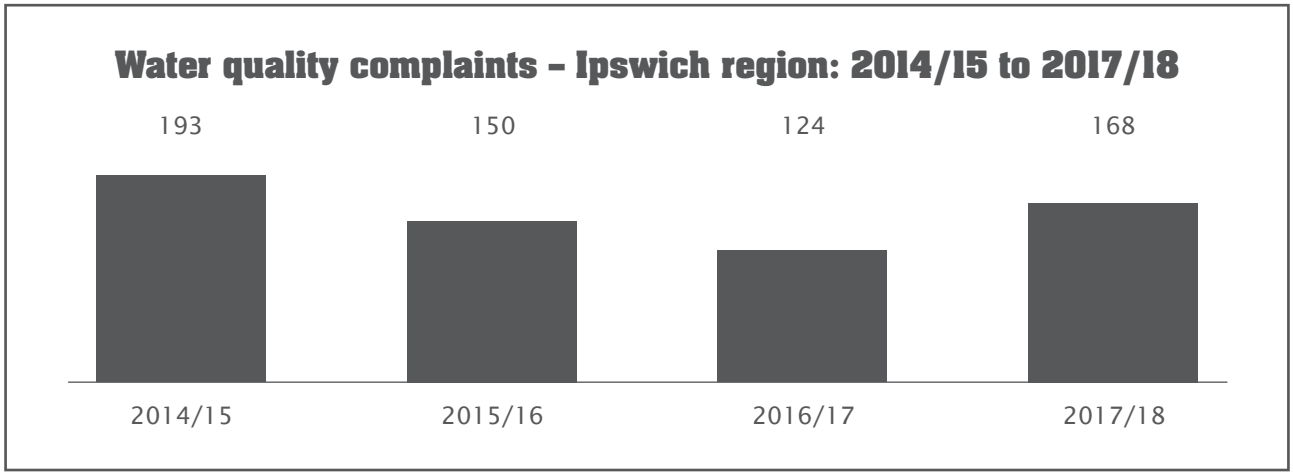


Figure 11: Notifications to the Regulator – Ipswich region: 1 July 2014 to 30 June 2018.

Customer satisfaction

In 2017/18, Queensland Urban Utilities investigated 168 water quality complaints in the Ipswich region. This is a 35% increase on the number of water quality complaints received in 2016/17. With 2.18 complaints per 1,000 property connections, we remained under the customer service standard of ≤6 complaints per 1,000 property connections.





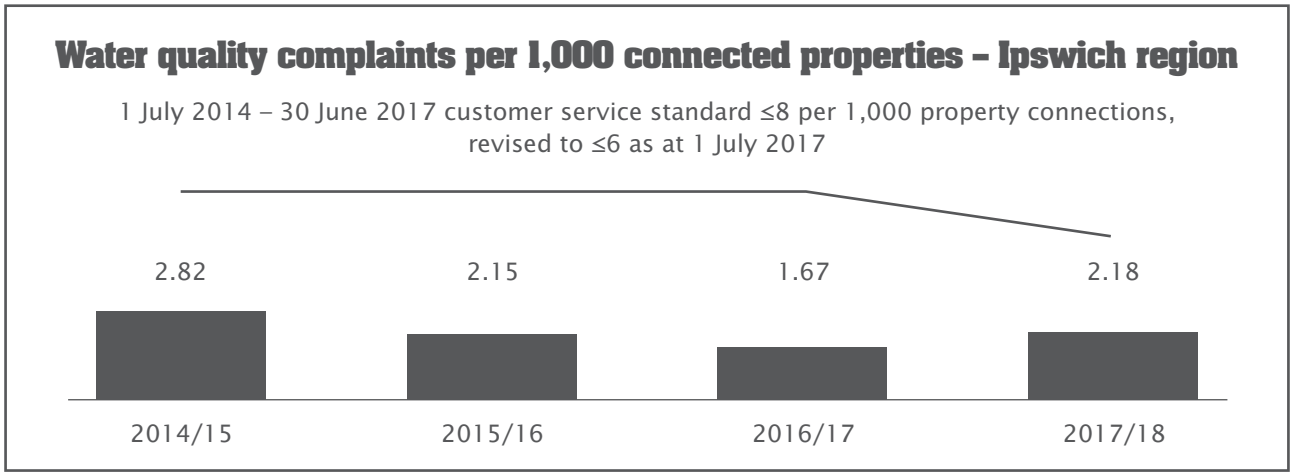


Figure 12: Customer satisfaction – Ipswich region.

CHAPTER 7: WATER QUALITY PERFORMANCE BY REGION

LOCKYER VALLEY REGION

In the Lockyer Valley region, water treated at Seqwater's Lowood WTP in the Somerset region, is distributed to the seven townships and surrounding areas of Forest Hill, Gatton, Grantham, Helidon, Laidley, Plainland and Withcott.

Notifications to the Regulator

Our water quality incidents represent the number of times a water quality sample does not meet the ADWG parameters, resulting in the immediate reporting of the incident to the Regulator. During 2017/18, there were no incidents in the Lockyer Valley region that required advice to the Regulator. This is the first time in four years Queensland Urban Utilities has achieved this outcome.

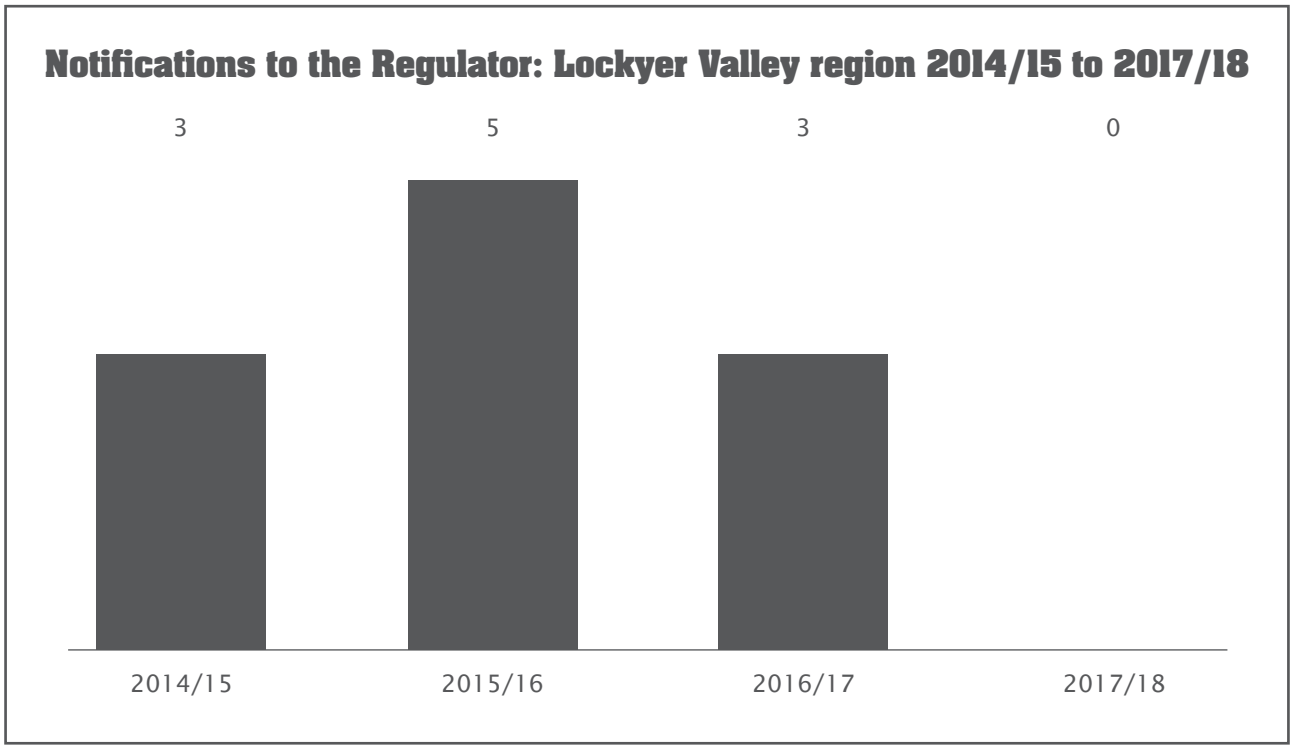


Figure 13: Notifications to the Regulator – Lockyer Valley region: 1 July 2014 to 30 June 2018.

Customer satisfaction

In 2017/18, Queensland Urban Utilities investigated 21 water quality complaints in the Lockyer Valley region. This is a 40% decrease on the number of water quality complaints received in 2016/17, and the lowest recorded in the last four years. We also saw improvement in the performance against the customer service standard of ≤6 complaints per 1,000 property connections.

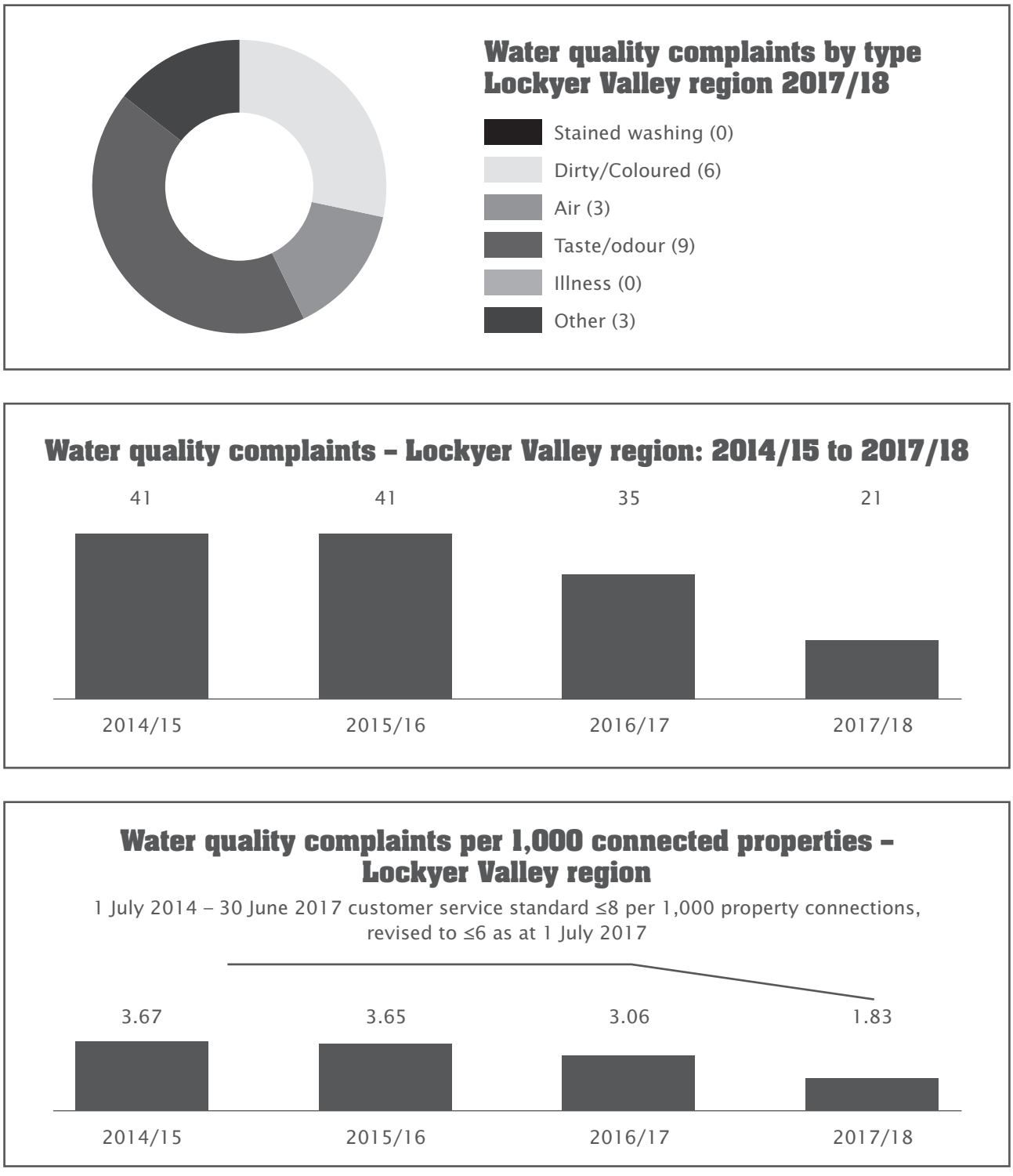


Figure 14: Customer satisfaction – Lockyer Valley region.

CHAPTER 7: WATER QUALITY PERFORMANCE BY REGION

SCENIC RIM REGION

In Scenic Rim, Seqwater operates WTPs at Beaudesert, Canungra, Kalbar, Kooralbyn and Rathdowney. Each WTP is connected to the Queensland Urban Utilities network, which supplies water to our customers in these towns. Water from the Kalbar WTP is supplied to Aratula, Kalbar, Boonah and Mount Alford. Chlorine is used as a disinfection residual in the distribution network.

The South East Queensland Water Supply Scheme, which services Brisbane and Ipswich, also supplies drinking water to our customers in Peak Crossing, Harrisville and Warrill View in the Scenic Rim.

Notifications to the Regulator

Our water quality incidents represent the number of times a water quality sample does not meet the ADWG parameters, resulting in the immediate reporting of the incident to the Regulator. During 2017/18, two incidents occurred in the Scenic Rim region which required advice to the Regulator. Table 3 summarises these notifications and how we responded to the event, with the diagram demonstrating performance over the last four years.

Date	Type	Location	Description	Preventative and corrective actions
20/10/2017	tTHM	Beaudesert	The non-compliance was a detection of total Trihalomethanes (tTHM) from a routine sample taken on 20/10/17 at SP512. 320ug/L was detected.	QUU undertook strategic flushing of the network to remove water with elevated THMs, and continued responsive sampling until THM levels were reduced.
2/12/2017	*E. coli*	Boonah-Worley Lane	The non-compliance was a detection of *E. coli* from a routine sample taken on 2/12/17 at SP541. 4MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	Continuous chlorine analysers remain on the inlet and outlet of the reservoir to manage operational water quality performance. In 2018/19 dedicated sample points will be installed on the reservoir and a new roof will be installed. The sample point on Macquarie Street, Boonah will be relocated closer to town to better understand water quality in the zone.

Table 4: Notifications to the Regulator – Scenic Rim: 1 July 2017 – 30 June 2018.

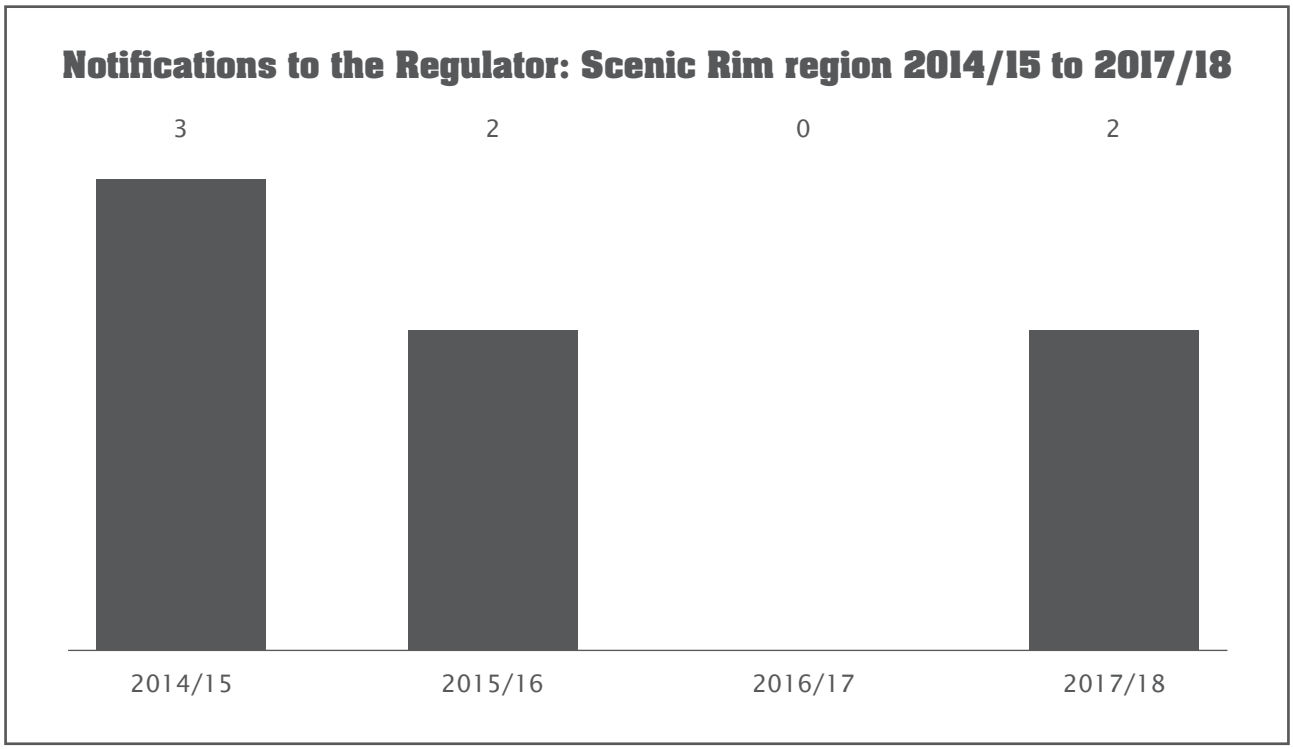
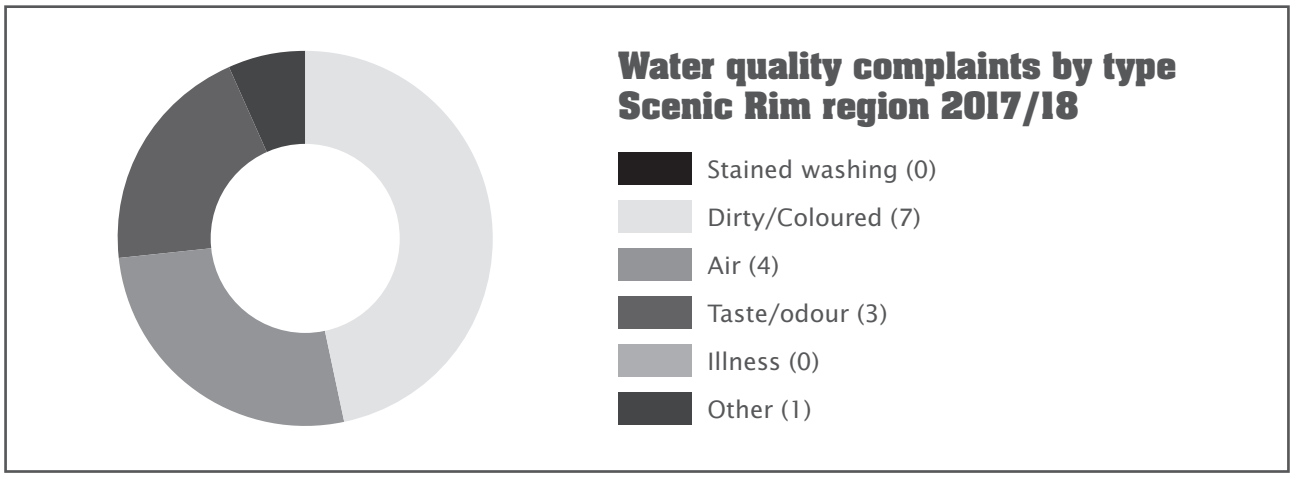


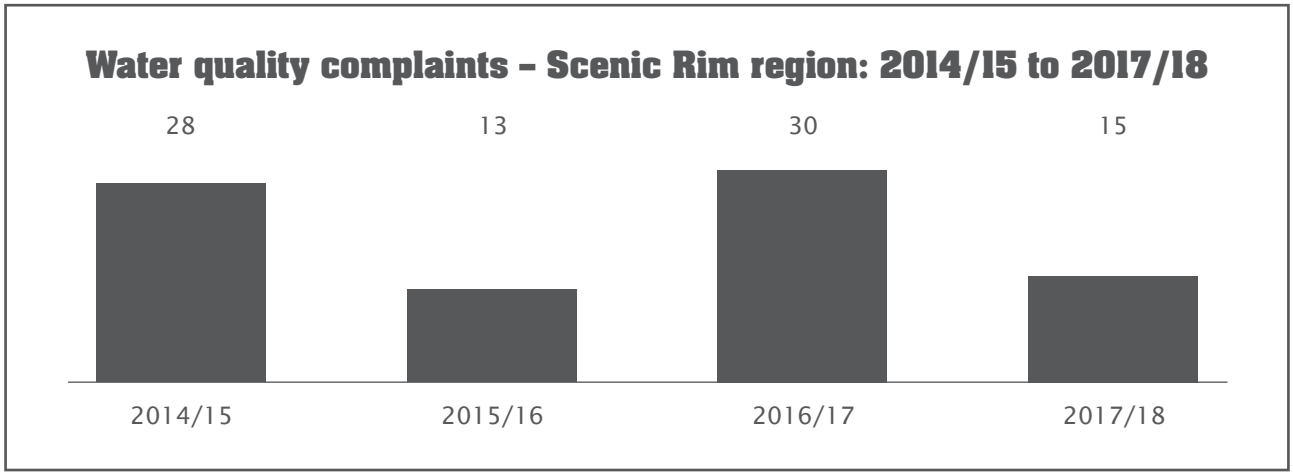
Figure 15: Notifications to the Regulator – Scenic Rim region: 1 July 2014 to 30 June 2018.

Customer satisfaction

In 2017/18, Queensland Urban Utilities investigated 15 water quality complaints in the Scenic Rim region. This is a 50% decrease on the number of water quality complaints received in 2016/17. We also remained well under the customer service standard of ≤6 complaints per 1,000 property connections.

CHAPTER 7: WATER QUALITY PERFORMANCE BY REGION





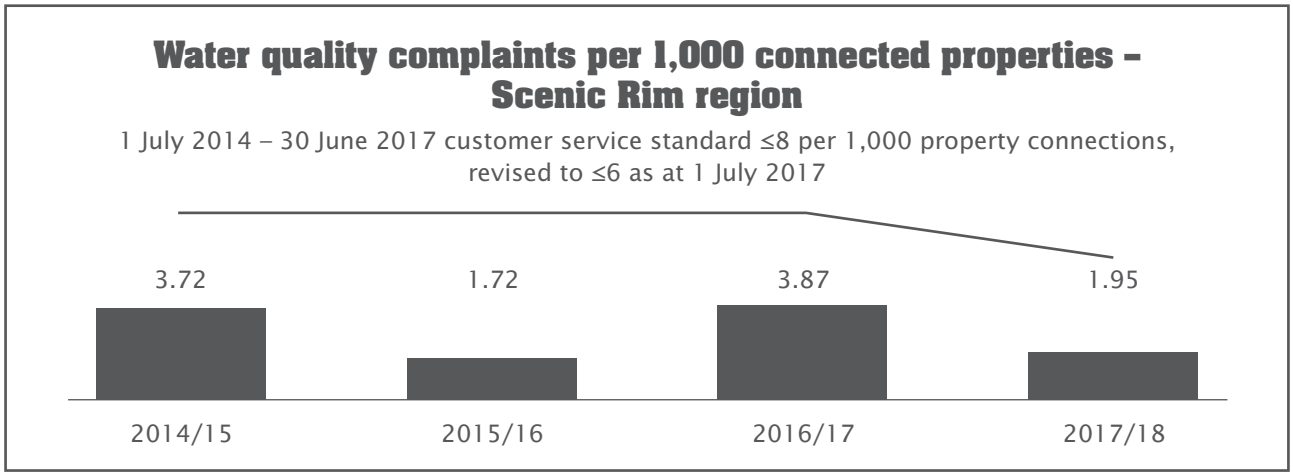


Figure 16: Customer satisfaction – Scenic Rim region.

SOMERSET REGION

In Somerset, Seqwater operates WTPs at Esk, Jimna, Kilcoy, Linville and Somerset township. Each WTP is connected to our network, which supplies water to our customers in these areas. The townships of Fernvale and Lowood, in the Somerset Regional Council area, are also supplied from the same Lowood WTP that supplies the Lockyer Valley. The Esk WTP supplies drinking water to Toogoolawah and Esk.

In 2013, floods compromised the bore that supplies the Linville WTP. As a result, Seqwater continues to supply water by tanker from Kilcoy to Linville.

Chlorine is used as a disinfection residual in the distribution networks in the Somerset region.

Notifications to the Regulator

Our water quality incidents represent the number of times a water quality sample does not meet the ADWG parameters, resulting in the immediate reporting of the incident to the Regulator. During 2017/18, there were three incidents in the Somerset region that required advice to the Regulator. Table 3 summarises these notifications and how we responded to the event, with the diagram demonstrating performance over the last four years.

Date	Type	Location	Description	Preventative and corrective actions
7/03/2018	tTHM	Somerset township	The non-compliance was a detection of total Trihalomethanes (tTHM) from a routine sample taken on 7/3/18 at SP640. 320ug/L was detected.	QUU undertook strategic flushing of the network to remove water with elevated THMs, and continued responsive sampling until THM levels were reduced. We have increased the frequency of THM sampling in the region. QUU continues to collaborate with Seqwater to ensure shared understanding the impact of the flushing of isolated schemes.
7/03/2018	tTHM	Kilcoy township	The non-compliance was a detection of total Trihalomethanes (tTHM) from a routine sample taken on 7/3/18 at: ▪ SP611 - 301ug/L was detected ▪ SP654 - 311ug/L was detected	QUU undertook strategic flushing of the network to remove water with elevated THMs, and continued responsive sampling until THM levels were reduced. We have increased the frequency of THM sampling in the region. QUU continues to collaborate with Seqwater to ensure shared understanding the impact of the flushing of isolated schemes.
28/05/18	*E. coli*	Minden	The non-compliance was a detection of *E. coli* from a routine sample taken on 28/5/18 at SP703. 2MPN *E. coli* organisms per 100mL was detected. Follow up samples exhibited no continued presence of *E. coli*.	This detection can be related to the repair of a reticulation main where the sample point is located. Strategic flushing was prepared and implemented. Samples taken within the same zone returned negative presences of *E.coli*.

Table 5: Notifications to the Regulator – Somerset region: 1 July 2017 – 30 June 2018.

CHAPTER 7: WATER QUALITY PERFORMANCE BY REGION

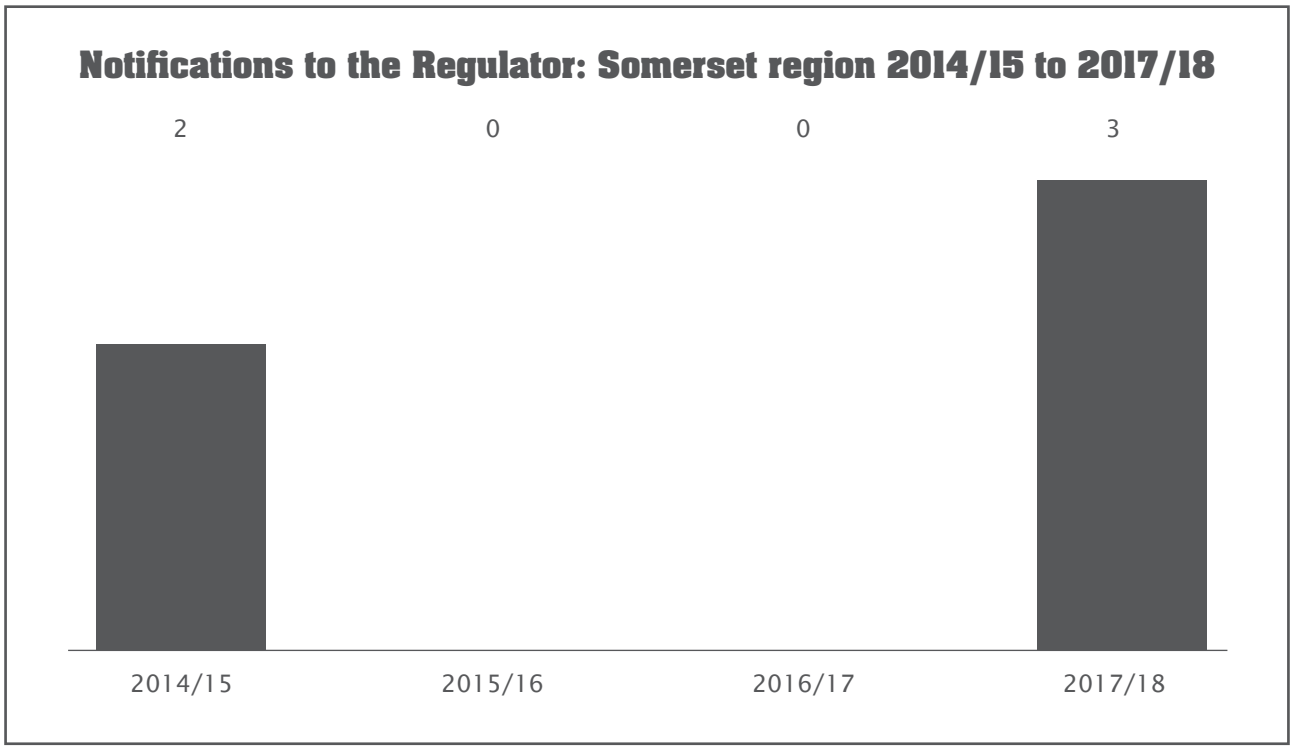
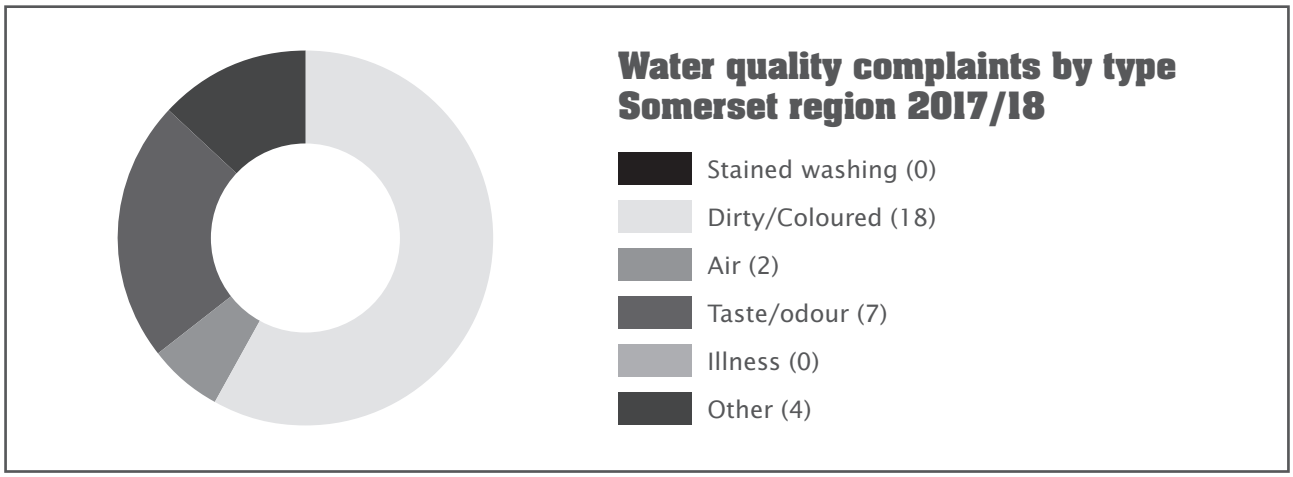
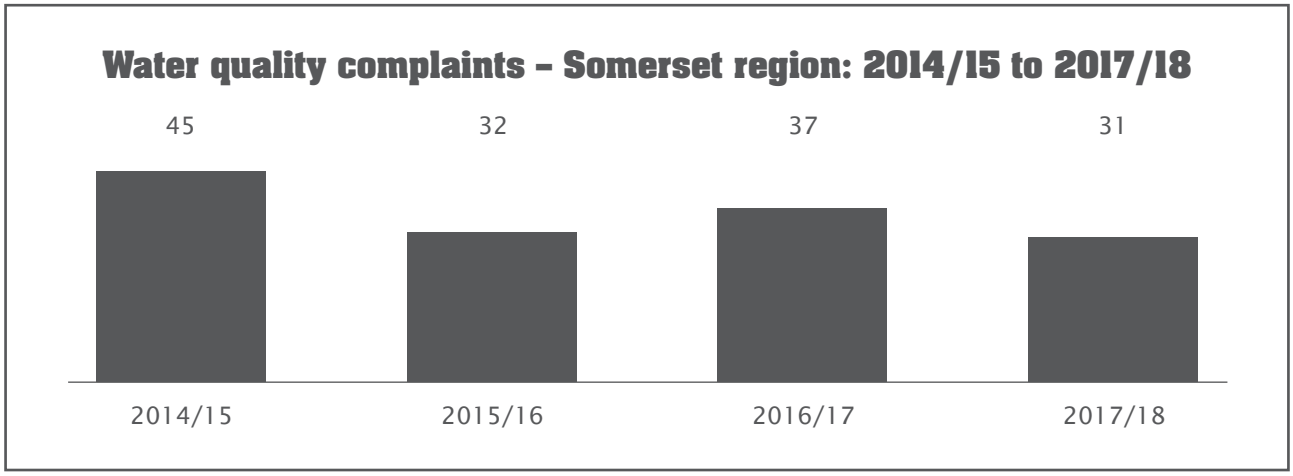


Figure 17: Notifications to the Regulator – Somerset region: 1 July 2014 to 30 June 2018.

Customer satisfaction

In 2017/18, Queensland Urban Utilities investigated 31 water quality complaints in the Somerset region. This a 16% decrease on the number of water quality complaints received in 2016/17, and is the lowest result in the last four years. We also remained well under the customer service standard of ≤6 complaints per 1,000 property connections.





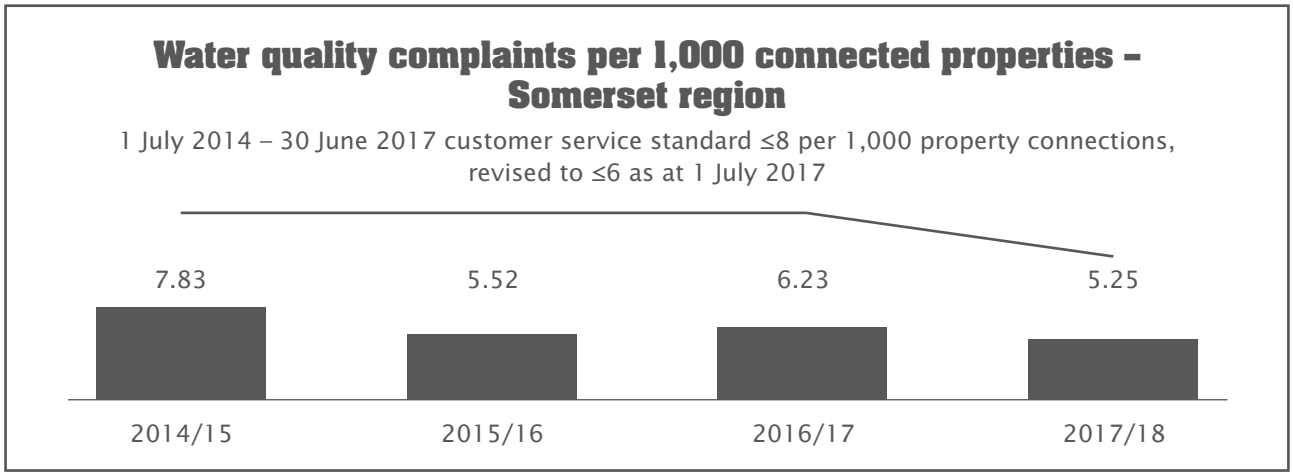


Figure 18: Customer satisfaction – Somerset region.

APPENDICES

Appendix A: Water quality compliance – *E. coli*

Overall						
Scheme	**Number of samples required**	**Actual number of samples**	**Number of samples *E. coli* detected**	**Required performance %**	**Actual performance %**	***E. coli* Compliant**
Beaudesert	64	332	0	98	100	☑
Boonah-Kalbar	52	363	1	98	99.7	☑
Brisbane-Ipswich	1728	8466	12	98	99.9	☑
Canungra	52	104	0	98	100	☑
Esk-Toogoolawah	52	104	0	98	100	☑
Jimna	12	52	0	98	100	☑
Kilcoy	52	104	0	98	100	☑
Kooralbyn	52	207	0	98	100	☑
Linville	12	52	0	98	100	☑
Lowood	124	1610	1	98	99.9	☑
Rathdowney	12	52	0	98	100	☑
Somerset	12	52	0	98	100	☑

Beaudesert *E. coli*						
2017-2018 Month	**Number of samples required**	**Actual number of samples**	**Number of samples *E. coli* detected**	**Required performance %**	**Actual performance %**	***E. coli* Compliant**
July	5	28	0	98	100	☑
August	6	35	0	98	100	☑
September	5	28	0	98	100	☑
October	6	35	0	98	100	☑
November	5	26	0	98	100	☑
December	5	24	0	98	100	☑
January	6	24	0	98	100	☑
February	5	30	0	98	100	☑
March	5	24	0	98	100	☑
April	5	24	0	98	100	☑
May	6	30	0	98	100	☑
June	5	24	0	98	100	☑

Boonah-Kalbar *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	4	28	0	98	100	☑
August	5	35	0	98	100	☑
September	4	28	0	98	100	☑
October	5	35	0	98	100	☑
November	4	21	0	98	100	☑
December	4	35	1	98	99.7	☑
January	5	35	0	98	99.7	☑
February	4	21	0	98	99.7	☑
March	4	35	0	98	99.7	☑
April	4	28	0	98	99.7	☑
May	5	34	0	98	99.7	☑
June	4	28	0	98	99.7	☑

Canungra *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	4	8	0	98	100	☑
August	5	10	0	98	100	☑
September	4	8	0	98	100	☑
October	5	10	0	98	100	☑
November	4	8	0	98	100	☑
December	4	8	0	98	100	☑
January	5	8	0	98	100	☑
February	4	10	0	98	100	☑
March	4	8	0	98	100	☑
April	4	8	0	98	100	☑
May	5	10	0	98	100	☑
June	4	8	0	98	100	☑

APPENDICES

Appendix A: Water quality compliance – *E. coli* (continued)

Esk-Toogoolawah *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	4	8	0	98	100	☑
August	5	10	0	98	100	☑
September	4	8	0	98	100	☑
October	5	8	0	98	100	☑
November	4	8	0	98	100	☑
December	4	10	0	98	100	☑
January	5	8	0	98	100	☑
February	4	10	0	98	100	☑
March	4	8	0	98	100	☑
April	4	8	0	98	100	☑
May	5	10	0	98	100	☑
June	4	8	0	98	100	☑

Jimna *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	1	4	0	98	100	☑
August	1	5	0	98	100	☑
September	1	4	0	98	100	☑
October	1	5	0	98	100	☑
November	1	4	0	98	100	☑
December	1	4	0	98	100	☑
January	1	5	0	98	100	☑
February	1	4	0	98	100	☑
March	1	4	0	98	100	☑
April	1	4	0	98	100	☑
May	1	5	0	98	100	☑
June	1	4	0	98	100	☑

Kilcoy *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	4	8	0	98	100	☑
August	5	10	0	98	100	☑
September	4	8	0	98	100	☑
October	5	8	0	98	100	☑
November	4	8	0	98	100	☑
December	4	10	0	98	100	☑
January	5	8	0	98	100	☑
February	4	10	0	98	100	☑
March	4	8	0	98	100	☑
April	4	8	0	98	100	☑
May	5	10	0	98	100	☑
June	4	8	0	98	100	☑

Kooralbyn *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	4	15	0	98	100	☑
August	5	20	0	98	100	☑
September	4	16	0	98	100	☑
October	5	20	0	98	100	☑
November	4	16	0	98	100	☑
December	4	16	0	98	100	☑
January	5	16	0	98	100	☑
February	4	20	0	98	100	☑
March	4	16	0	98	100	☑
April	4	16	0	98	100	☑
May	5	20	0	98	100	☑
June	4	16	0	98	100	☑

APPENDICES

Appendix A: Water quality compliance – *E. coli* (continued)

Linville *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	1	4	0	98	100	☑
August	1	5	0	98	100	☑
September	1	4	0	98	100	☑
October	1	5	0	98	100	☑
November	1	4	0	98	100	☑
December	1	4	0	98	100	☑
January	1	5	0	98	100	☑
February	1	4	0	98	100	☑
March	1	4	0	98	100	☑
April	1	4	0	98	100	☑
May	1	5	0	98	100	☑
June	1	4	0	98	100	☑

Lowood *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	10	146	0	98	99.8	☑
August	11	132	0	98	99.8	☑
September	10	124	0	98	99.8	☑
October	11	147	0	98	99.8	☑
November	10	117	0	98	99.9	☑
December	10	139	0	98	99.9	☑
January	11	139	0	98	99.9	☑
February	10	117	0	98	99.9	☑
March	10	147	0	98	100	☑
April	10	140	0	98	100	☑
May	11	138	1	98	99.9	☑
June	10	124	0	98	99.9	☑

Rathdowney *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	1	4	0	98	100	☑
August	1	5	0	98	100	☑
September	1	4	0	98	100	☑
October	1	5	0	98	100	☑
November	1	4	0	98	100	☑
December	1	4	0	98	100	☑
January	1	4	0	98	100	☑
February	1	5	0	98	100	☑
March	1	4	0	98	100	☑
April	1	4	0	98	100	☑
May	1	5	0	98	100	☑
June	1	4	0	98	100	☑

Somerset *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	1	4	0	98	100	☑
August	1	5	0	98	100	☑
September	1	4	0	98	100	☑
October	1	4	0	98	100	☑
November	1	4	0	98	100	☑
December	1	5	0	98	100	☑
January	1	4	0	98	100	☑
February	1	5	0	98	100	☑
March	1	4	0	98	100	☑
April	1	4	0	98	100	☑
May	1	5	0	98	100	☑
June	1	4	0	98	100	☑

APPENDICES

Appendix A: Water quality compliance – *E. coli* (continued)

South East Queensland Water Supply (Brisbane and Ipswich) *E. coli*						
2017-2018 Month	Number of samples required	Actual number of samples	Number of samples *E. coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
July	142	678	0	98	99.9	☑
August	148	734	0	98	99.9	☑
September	142	690	0	98	99.9	☑
October	148	709	1	98	99.9	☑
November	142	721	1	98	99.9	☑
December	142	714	2	98	99.9	☑
January	148	764	4	98	99.9	☑
February	142	659	2	98	99.9	☑
March	142	709	1	98	99.8	☑
April	142	678	0	98	99.9	☑
May	148	779	1	98	99.9	☑
June	142	631	0	98	99.9	☑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Appendix B: Water quality compliance – health assessment

Beaudesert Health Assessment							
Parameter	Units	ADWG Health Guideline	Number of tests	Exceedance Count	Maximum Result	95th %-ile	Meets ADWG
Arsenic	mg/L	0.01	12	0	<0.001	<0.001	☑
Barium	mg/L	2	12	0	0.053	0.045	☑
Cadmium	mg/L	0.002	12	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	332	0	2.5	1.7	☑
Chlorine (Total)	mg/L	5	332	0	2.6	1.9	☑
Chromium	mg/L	0.05	12	0	<0.001	<0.001	☑
Copper	mg/L	2	12	0	0.013	0.012	☑
Fluoride	mg/L	1.5	12	0	0.90	0.87	☑
Lead	mg/L	0.01	12	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	101	0	<0.001	<0.001	☑
Nickel	mg/L	0.02	12	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	117	1	320	210	☑

Boonah-Kalbar Health Assessment							
Parameter	Units	ADWG Health Guideline	Number of tests	Exceedance Count	Maximum Result	95th %-ile	Meets ADWG
Arsenic	mg/L	0.01	13	0	<0.001	<0.001	☑
Barium	mg/L	2	13	0	0.028	0.025	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	363	0	2.5	1.6	☑
Chlorine (Total)	mg/L	5	363	0	2.6	1.8	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.002	0.002	☑
Fluoride	mg/L	1.5	13	0	0.91	0.89	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	208	0	0.064	0.002	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	33	0	230	200	☑

Canungra Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	13	0	<0.001	<0.001	☑
Barium	mg/L	2	13	0	0.011	0.010	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	104	0	2.6	2.3	☑
Chlorine (Total)	mg/L	5	104	0	3.1	2.5	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.003	0.003	☑
Fluoride	mg/L	1.5	13	0	0.72	0.43	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	52	0	0.014	0.003	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	13	0	110	84	☑

Esk-Toogoolawah Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	13	0	<0.001	<0.001	☑
Barium	mg/L	2	13	0	0.027	0.026	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	104	0	2.6	1.9	☑
Chlorine (Total)	mg/L	5	104	0	2.7	2.2	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.003	0.002	☑
Fluoride	mg/L	1.5	13	0	0.90	0.90	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	104	0	0.005	0.003	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	13	0	180	170	☑

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Appendix B: Water quality compliance – health assessment (continued)

Jimna Health Assessment

Parameter	Units	ADWG Health Guideline	Number of tests	Exceedance Count	Maximum Result	95th %-ile	Meets ADWG
Arsenic	mg/L	0.01	13	0	<0.001	<0.001	☑
Barium	mg/L	2	13	0	0.016	0.015	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	52	0	3.3	2.4	☑
Chlorine (Total)	mg/L	5	52	0	3.5	2.5	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.004	0.004	☑
Fluoride	mg/L	1.5	13	0	0.08	0.08	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	52	0	0.003	0.002	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	13	0	180	170	☑

Kilcoy Health Assessment

Parameter	Units	ADWG Health Guideline	Number of tests	Exceedance Count	Maximum Result	95th %-ile	Meets ADWG
Arsenic	mg/L	0.01	13	0	<0.001	<0.001	☑
Barium	mg/L	2	13	0	0.020	0.019	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	104	0	1.4	1.2	☑
Chlorine (Total)	mg/L	5	104	0	1.7	1.5	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.003	0.003	☑
Fluoride	mg/L	1.5	13	0	0.83	0.82	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	52	0	0.026	0.007	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	13	1	310	210	☑

Kooralbyn Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	13	0	<0.001	<0.001	☑
Barium	mg/L	2	13	0	0.034	0.033	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	207	0	2.3	1.9	☑
Chlorine (Total)	mg/L	5	207	0	2.5	2.2	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.002	0.002	☑
Fluoride	mg/L	1.5	13	0	0.88	0.87	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	52	0	0.007	0.003	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	60	0	190	150	☑

Linville Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	13	0	<0.001	<0.001	☑
Barium	mg/L	2	13	0	0.018	0.018	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	52	0	4.1	3.2	☑
Chlorine (Total)	mg/L	5	52	0	4.6	3.6	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.004	0.003	☑
Fluoride	mg/L	1.5	13	0	0.81	0.80	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	52	0	0.013	0.008	☑
Nickel	mg/L	0.02	13	0	0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	13	1	300	230	☑

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Appendix B: Water quality compliance – health assessment (continued)

Lowood Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	104	0	<0.001	<0.001	☑
Barium	mg/L	2	104	0	0.038	0.033	☑
Cadmium	mg/L	0.002	104	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	1609	0	3.4	2.1	☑
Chlorine (Total)	mg/L	5	1609	0	3.9	2.4	☑
Chromium	mg/L	0.05	104	0	<0.001	<0.001	☑
Copper	mg/L	2	104	0	0.048	0.011	☑
Fluoride	mg/L	1.5	104	0	0.98	0.92	☑
Lead	mg/L	0.01	104	0	0.003	0.001	☑
Manganese	mg/L	0.5	598	0	0.018	0.002	☑
Nickel	mg/L	0.02	104	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	144	0	250	210	☑

Rathdowney Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	13	0	<0.001	<0.001	☑
Barium	mg/L	2	13	0	0.071	0.070	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	52	0	1.7	1.2	☑
Chlorine (Total)	mg/L	5	52	0	2.0	1.5	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.003	0.003	☑
Fluoride	mg/L	1.5	13	0	0.20	0.19	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	52	0	<0.001	<0.001	☑
Nickel	mg/L	0.02	13	0	0.008	0.004	☑
Trihalomethanes (Total)	ug/L	250	20	0	190	190	☑

Somerset Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	13	0	<0.001	<0.001	☑
Barium	mg/L	2	13	0	0.019	0.019	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	52	0	2.3	1.8	☑
Chlorine (Total)	mg/L	5	52	0	2.5	2.1	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.004	0.004	☑
Fluoride (as F)	mg/L	1.5	13	0	0.098	0.097	☑
Lead	mg/L	0.01	13	0	0.002	0.002	☑
Manganese	mg/L	0.5	52	0	0.014	0.011	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	20	1	310	230	☑

South East Queensland Water Supply (Brisbane and Ipswich) Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	156	0	<0.001	<0.001	☑
Barium	mg/L	2	156	0	0.037	0.029	☑
Cadmium	mg/L	0.002	156	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	1068	0	2.3	0.98	☑
Chlorine (Total)	mg/L	5	8466	0	3.7	2.2	☑
Chromium	mg/L	0.05	156	0	<0.001	<0.001	☑
Copper	mg/L	2	156	0	0.72	0.027	☑
Dichloroacetic Acid	ug/L	100	242	0	25	12	☑
Fluoride	mg/L	1.5	156	0	0.87	0.75	☑
Lead	mg/L	0.01	156	0	0.005	<0.001	☑
Manganese	mg/L	0.5	2708	0	0.200	0.014	☑
Monochloroacetic Acid	ug/L	150	242	0	<10	<10	☑
Nickel	mg/L	0.02	156	0	0.001	<0.001	☑
Nitrate	mg/L	50	2737	0	6.20	3.97	☑
Nitrite	mg/L	3	2737	0	1.22	0.27	☑
Trichloroacetic Acid	ug/L	100	242	0	12	<10	☑
Trihalomethanes (Total)	ug/L	250	374	0	190	160	☑

APPENDICES

Appendix C: Water quality – aesthetic assessment

Paramter (Median values)	Units	ADWG Aesthetic Guideline Value	Beaudesert	Boonah-Kalbar	Canungra	Esk-Toogoolawah	Jimna	Kilcoy	Kooralbyn	Linville	Lowood	Rathdowney	SEQ Water Supply (Brisbane and Ipswich	Somerset Township
2-Methyl isoborneol	ng/L	-	<2	<2	<2	2.2	<2	2.3	<2	2.5	3.6	<2	2.7	4.0
Aluminium	mg/L	0.2	0.012	0.034	0.017	0.056	0.021	0.025	0.022	0.026	0.028	0.009	0.046	0.035
Ammonia (Total, as N)	mg/L	0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.057	NT
Chloride	mg/L	250	72	52	19	62	31	33	61	35	63	100	62	37
Colour (True)	PCU	15	<0.5	0.6	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	0.7	<0.5
Conductivity	uS/cm	1000	500	440	210	420	440	320	500	330	440	590	460	270
Geosmin	ng/L	-	<2	2.4	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Iron	mg/L	0.3	0.004	0.009	0.006	0.007	0.004	0.020	0.007	0.013	0.009	0.005	0.011	0.059
Langelier Index	-	-	0.16	-0.56	-0.62	-0.27	-0.95	-0.61	0.09	-0.48	-0.42	0.41	-0.25	-0.81
pH	pH Unit	6.5 - 8.5	8.0	7.5	7.8	7.4	7.4	7.6	8.1	7.7	7.5	8.1	7.7	7.8
Silica	mg/L	80	22	12	23	3.0	11	6.2	20	5.4	3.4	17	4.6	3.0
Sodium	mg/L	180	52	50	12	41	72	32	47	34	38	62	40	30
Sulphate (as SO4)	mg/L	250	12	48	1.0	27	81	41	55	45	29	9.0	28	22
Temperature	deg C	-	24	24	23	24	22	24	24	23	24	22	25	24
Total Dissolved Solids	mg/L	600	320	280	130	270	280	200	320	210	280	380	290	170
Total Hardness	mg/L	200	130	98	60	110	47	72	130	74	120	150	120	56
Turbidity	NTU	5	<0.1	0.1	0.1	0.1	<0.1	0.2	0.1	0.2	0.1	<0.1	0.2	0.2
Zinc	mg/L	3	0.002	0.001	0.002	<0.001	0.013	0.003	0.003	0.003	0.003	0.005	0.004	0.005
Meets ADWG Guideline			☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑

GLOSSARY

<	Less than
>	Greater than
2-Methyl isoborneol	A compound produced from algae in catchments contributing to taste and odour of water typically described as earthy, musty, swampy or metallic. May become noticeable at greater than 5ng/L.
Ammonia (NH_3)	A highly soluble compound resulting from the decomposition of organic matter containing nitrogen. Ammonia will be detected in chloraminated water as it is a component of chloramine.
Australian Drinking Water Guidelines 2011 (ADWG)	The guidelines were developed by the National Health and Medical Research Council (NHMRC) and undergo rolling revision to ensure they represent the latest scientific evidence on good quality drinking water.
Bulk water	The treated water supplied from the Queensland Bulk Water Authority (Seqwater) to distributor retailers, including Queensland Urban Utilities.
Chloramination / chloramine	The application of chlorine and ammonia to create monochloramine (NH2Cl), a stable disinfectant that is added to drinking water to inactivate bacteria or to oxidise undesirable compounds. Chloramines persist for a longer time than chlorine and as a result are used in longer water distribution systems.
Chlorine – Free	The residual formed with chlorine dosage once all the chlorine demand has been satisfied. This chlorine is free to inactivate microorganisms.
Chlorine – Total	Total chlorine is the sum of combined and free chlorine including chloramine.
CFU/100mL	Colony Forming Units per 100 millilitres.
Colour (True)	Colour is mainly due to the presence of dissolved substances from organic matter in water, such as decaying leaves and vegetation. True colour refers to the colour of water after particles of organic matter have been removed through filtration and is the measurement of the extent to which light is absorbed by the water.
Department of Natural Resources, Mines and Energy (DNRME)	The Queensland Government department responsible for overseeing Queensland's water industries to ensure these essential services are provided to Queenslanders in a safe, efficient and reliable way.
Disinfectant	An agent that inactivates microorganisms which cause disease. Queensland Urban Utilities uses either chlorine or chloramine.
Disinfection by-products (DBPs)	Products of reactions between disinfectants, particularly chlorine and naturally occurring organic material.
Drinking water	Water that is suitable for human consumption.
Drinking Water Quality Management Plan (DWQMP)	Drinking Water Quality Management Plan as required by the *Water Supply (Safety and Reliability) Act 2008*. The purpose of a DWQMP is to protect public health by implementing a risk-management system to manage the quality of drinking water.
Drinking Water Quality Management System (DWQMS)	Queensland Urban Utilities' DWQMS is used to ensure our drinking water supplies are managed effectively to provide high quality drinking water and to ensure the protection of public health.
Escherichia coli *(E. coli)*	A bacterium when present in water indicates that the water may be contaminated by faecal matter and therefore there is the potential to cause illness when people drink the water. *E. coli* can be killed by standard disinfection practices.
Fluoride (F)	Fluoride is regarded as a useful constituent of drinking water, particularly for the prevention of tooth decay. Concentration is maintained within the recommended levels set by QHealth.
Geosmin	A compound produced from algae in catchments contributing to taste and odour of water typically described as earthy, musty, swampy or metallic. May become noticeable at greater than 5ng/L.

Iron (Fe)	An element which, when found in water, can cause a brownish discolouration. Limits on the amount of iron in water are usually due to taste and appearance factors rather than any detrimental health effects.
km	Kilometre, which is 1,000 metres
Manganese (Mn)	Manganese in a water supply may affect taste, cause staining of clothes, produce deposits in pipes and contribute to turbidity.
Megalitre (ML)	One million litres or 1,000 kilolitres
mg/L	milligrams per litre
MPN/100mL	Most Probable Number per 100 millilitres
Naturally occurring	Present in the natural environment as minerals, elements, salts and other substances.
ng/L	Nanograms per millilitre
Network	An arrangement or system of pipes, pumps and reservoirs used for distributing water.
Nephelometric Turbidity Unit (NTU)	A measure of turbidity which is the cloudiness or haziness of water caused by particles that are generally invisible to the naked eye. The measurement of turbidity is a key test of water quality.
Nitrate (NO_3)	The most stable form of combined nitrogen in water. Present in surface waters in small amounts generally not removed through treatment. Nitrate can be found in chloraminated water supplies as a result of chloramine breakdown.
pH	The pH value indicates if a substance is acidic, neutral or alkaline. It is calculated from the number of hydrogen ions present and is measured on a scale from zero to 14. A pH greater than seven is alkaline, less than seven is acidic and seven is neutral. The pH of public water supplies should be slightly alkaline to minimise corrosion and stabilise disinfection.
Reservoir	A water tower or tank used for the storage of treated water within the water distribution system.
SAS Lab	Scientific Analytical Services Laboratory, Queensland Urban Utilities.
Scheme	The system distributing drinking water to customers.
Seqwater	Queensland Bulk Water Supply Authority, trading as Seqwater. The bulk drinking water provider for Queensland Urban Utilities.
Shareholders	Brisbane and Ipswich City Councils, and the Lockyer Valley, Scenic Rim and Somerset Regional Councils.
Stakeholder	All those who are either affected by or who can affect the activities of an organisation, namely customers, governments, regulators, the media, non-government organisations, local residents and employees.
The Regulator	See Department of Natural Resources, Mines and Energy (DNRME).
Total dissolved solids (TDS)	A measure of inorganic salts and small amounts of organic matter that are dissolved in water. Usually determined by converting electrical conductivity to TDS values.
Total hardness	Total hardness is the sum of the concentrations of calcium and magnesium ions expressed as calcium carbonate (CaCO3) equivalent. Waters with a high mineral content (a total hardness in excess of 200 mg/L) are considered hard.
Total Trihalomethanes (TTHMs)	A group of disinfection by-products that generally form when chlorine is used to disinfect drinking water.
Turbidity	Refers to the presence of suspended solids in water causing a muddy or discoloured appearance. Turbidity is measured in Nephelometric Turbidity Units (NTU).
Verification Monitoring Program (VMP)	Water quality verification monitoring is used as the final check that the barriers and preventive measures used in protecting the public health from drinking water risks are performing effectively. Verification monitoring is used to verify the quality of drinking water supplied to Queensland Urban Utilities' customers as well as collecting data to complement future operational monitoring programs.
Water Treatment Plant (WTP)	A plant that improves water quality by removing impurities through filtration and disinfection.

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