QUEENSLAND UrbanUtilities

2016/17

DRINKING WATER QUALITY MANAGEMENT PLAN REPORT

ENRICH QUALITY OF LIFE

ABOUT THIS REPORT

The Queensland Urban Utilities *2016/17 Drinking Water Quality Management Plan Report* 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

This report aims to communicate comprehensive information to satisfy the needs of individuals and groups who are affected by, or have an interest in, our activities, including:

- our customers,
- the communities we serve,
- current and future employees,
- our shareholders,
- government,
- other utilities, and
- business and industry.

Glossary

A glossary explaining the meaning of words and acronyms can be found on pages 56-57.

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 this report, please contact us on 13 14 50 and we will arrange an interpreter to communicate the report to you effectively.

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2016/17 IN REVIEW

TOTAL WATER DELIVERED

128,714ML
THROUGH
9,298KM
OF WATER MAINS SUPPORTED BY 108 ACTIVE, IN-SERVICE DRINKING WATER RESERVOIRS, 63 WATER PUMP STATIONS, 83 WATER BOOSTERS

CUSTOMERS SERVED

86,609ML
TO 562,000 RESIDENTIAL PROPERTIES

42,105ML
TO 37,000 NON-RESIDENTIAL PROPERTIES

WATER TESTS CONDUCTED

(INCLUDES SAMPLES FOR HEALTH-RELATED COMPLIANCE)

114,000 IN 2016/17

INCIDENT NOTIFICATIONS

ACHIEVED A
21% REDUCTION
IN INCIDENT NOTIFICATIONS COMPARED WITH 2015/16

see page 18

DRINKING WATER QUALITY AND PERFORMANCE

ACHIEVED
100% COMPLIANCE
WITH THE AUSTRALIAN DRINKING WATER GUIDELINES 2011 HEALTH-RELATED PARAMETERS

ACHIEVED
100% COMPLIANCE
WITH THE AUSTRALIAN DRINKING WATER GUIDELINES 2011 CHEMICAL-RELATED PARAMETERS

ACHIEVED
100% COMPLIANCE
WITH THE AUSTRALIAN DRINKING WATER GUIDELINES 2011 AESTHETIC-RELATED PARAMETERS

see page 16

WATER SUPPLY (SAFETY AND RELIABILITY) ACT 2008

WE SUCCESSFULLY
COMPLETED
THE FIRST AUDIT OF OUR DRINKING WATER QUALITY MANAGEMENT PLAN AND MET ALL LEGISLATIVE REQUIREMENTS

see page 38

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:

- 18,700km of pipeline,
- 146 water pump stations and boosters,
- 332 sewage pump stations,
- 108 active, in-service drinking water reservoirs, and
- 29 sewage treatment plants.

Our strategic framework

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 provide focus for the objectives and strategies that will enable us to achieve our purpose and vision. For 2016/17, our strategic pillars were:

- Customers and communities

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

- Shareholders and strategic stakeholders

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

- 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.

- People

We embody a culture where our employees live our values, are engaged and enabled, and are driven to achieve our purpose and vision.

Our key partners

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

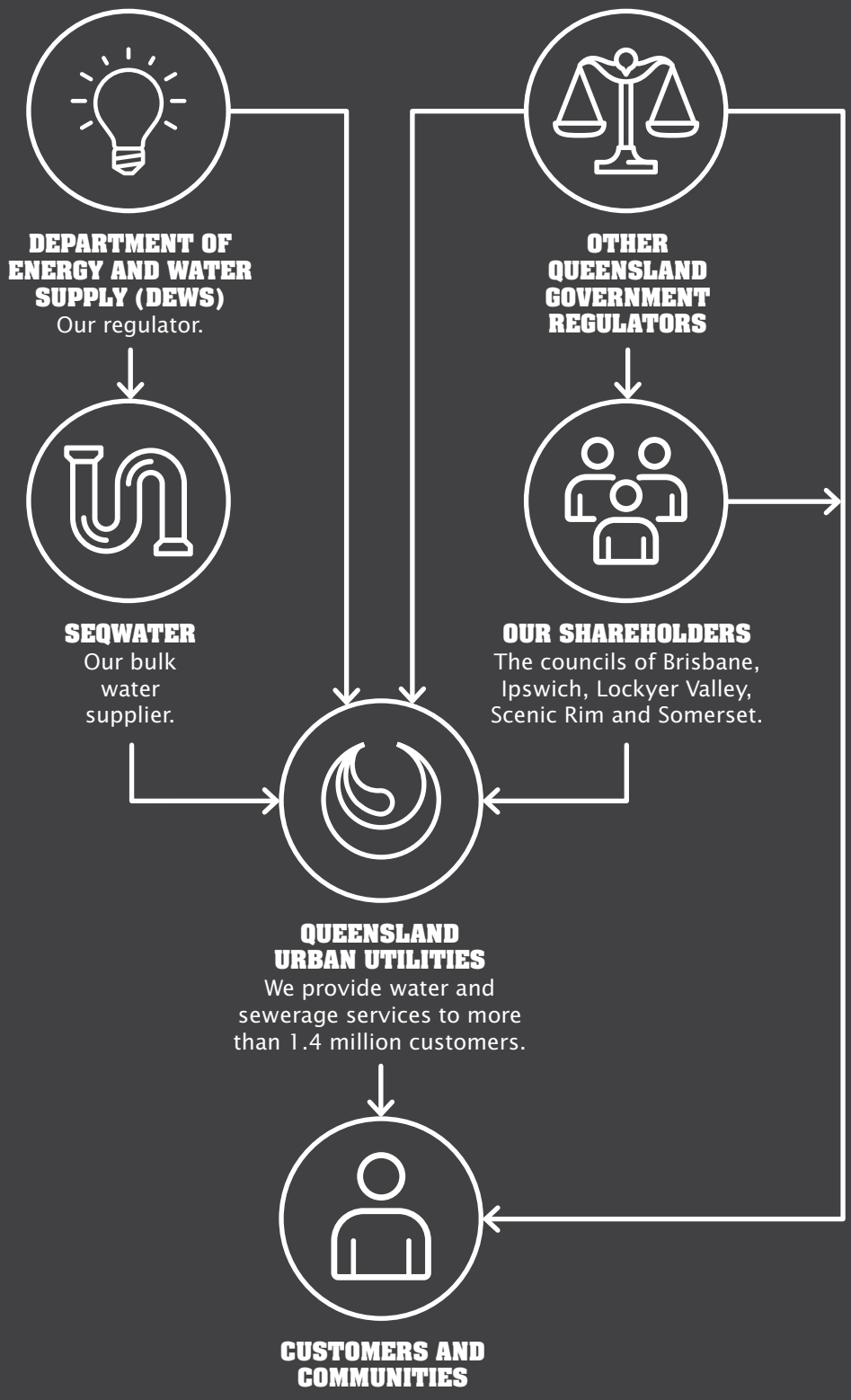


Figure 1: Our key partners.

CHAPTER 2: DELIVERING WATER TO OUR CUSTOMERS

Figure 2: Queensland Urban Utilities' water supply schemes.

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.

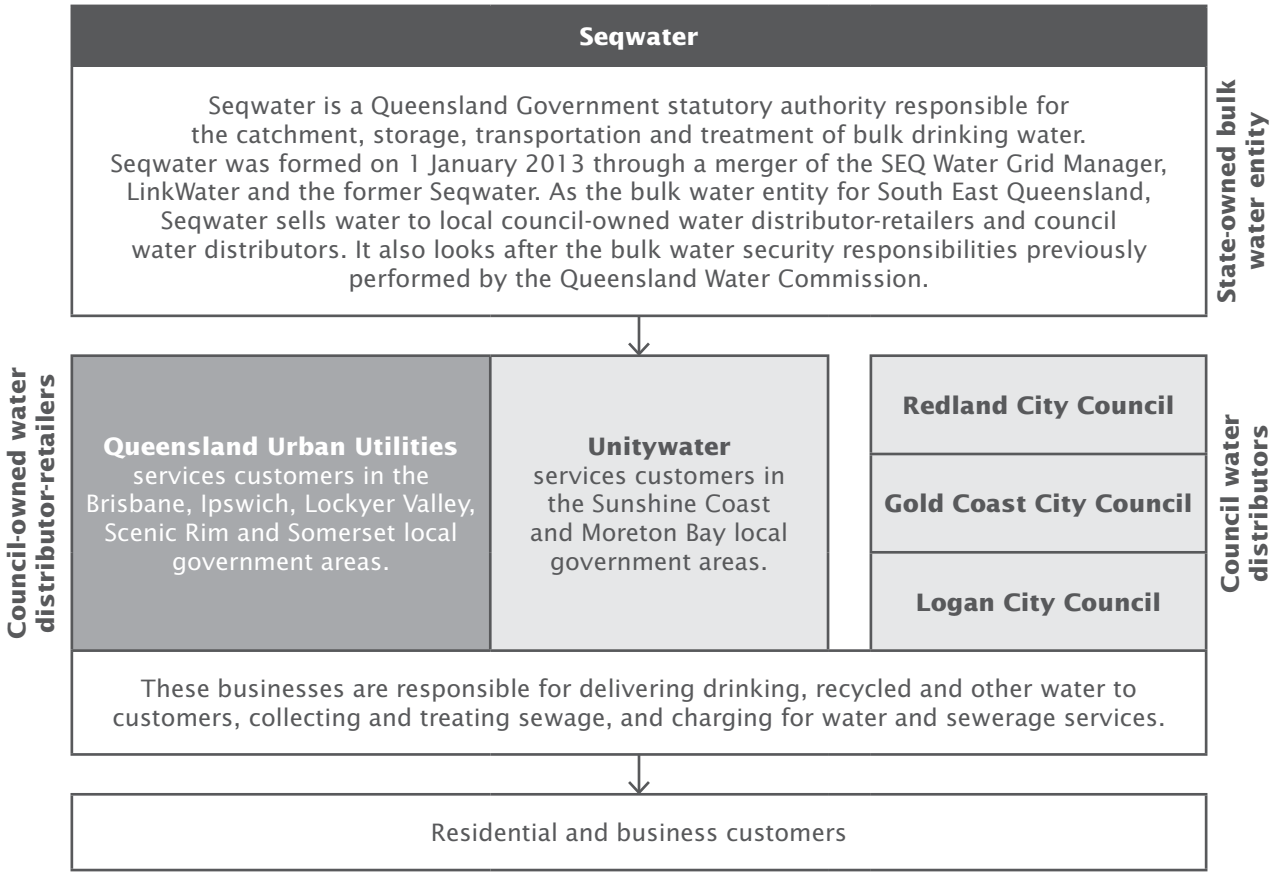


Figure 3: Queensland Urban Utilities' relationship with Seqwater.

Delivering drinking water

Queensland Urban Utilities provides drinking water services to 1.4 million people residing within its 14,384km^2 geographic area, 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 (in alphabetical order):

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 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 (page 11) 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

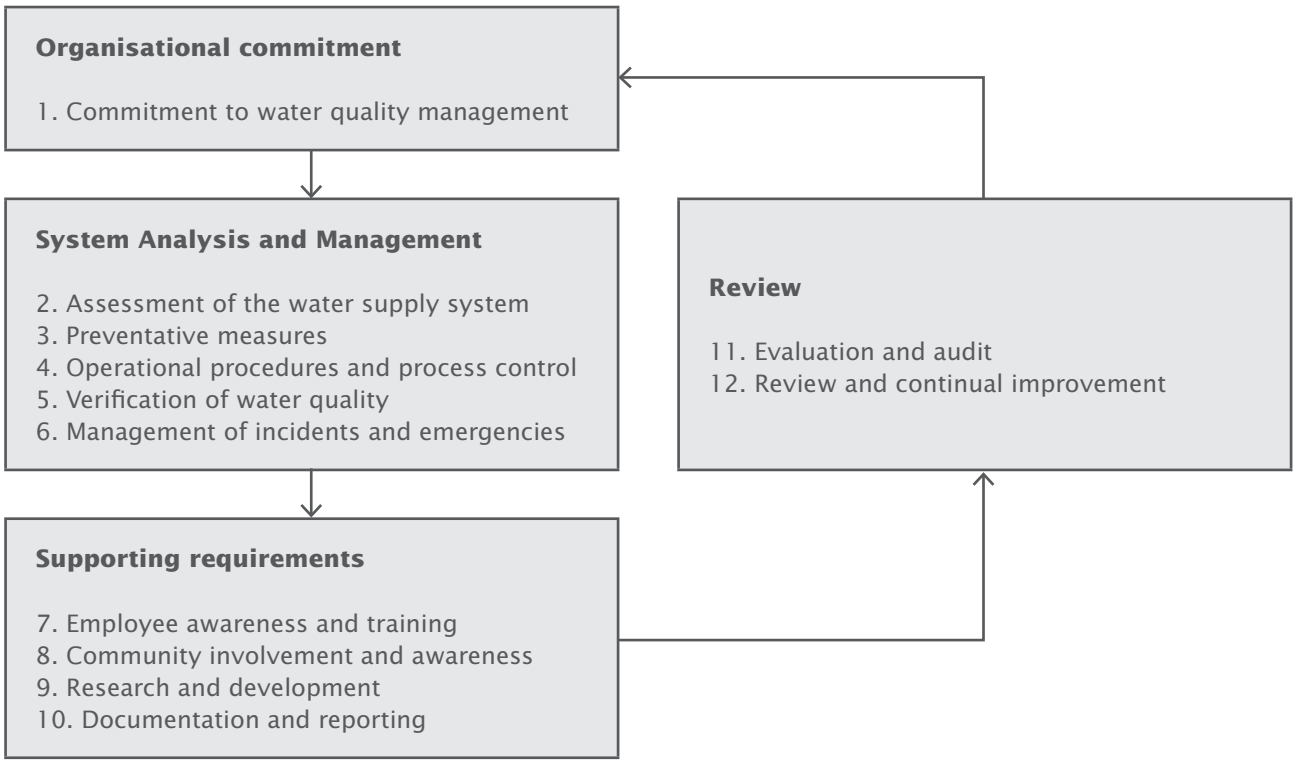
The supply of safe and reliable drinking water in Queensland is regulated by state legislation, including the W*ater Supply (Safety and Reliability) Act 2008*, the *South-East Queensland Water (Distribution and Retail Restructuring) Act 2009*, and the *Public Health Act 2005*.

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).

Under the *Public Health Act 2005*, Queensland Health (QHealth) has regulated 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:



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.

Verification monitoring program

To ensure safe drinking water Queensland Urban Utilities monitors the quality of the water through a comprehensive testing program, the 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. The VMP verifies the quality of drinking water supplied to our customers, as well as collecting data to complement future operational monitoring programs.

In 2016/17, Queensland Urban Utilities collected over 9,000 drinking water samples from over 300 dedicated drinking water sampling points throughout our distribution networks. Our Scientific Analytical Services Laboratory produced 114,000 analytical tests to verify the quality of the drinking water supplied to our customers. Each of these water quality parameters is compared to the ADWG and prescribed requirements of our legislation.

As part of our commitment to continuous improvement, we have implemented a rolling sample point replacement program to improve the quality of infrastructure used in monitoring drinking water.

In 2015/16, monthly external auditing of compliance for the drinking water quality monitoring program was initiated and continued through 2016/17, demonstrating ongoing excellence in the management of drinking water quality monitoring.

In early 2017/18, we will be reviewing and challenging our current drinking water quality risk assessment using information gained from the VMP, changes in Seqwater treatment plants and network configurations. The revised risk assessment will drive refinement of the VMP to ensure we continue to efficiently monitor the drinking water, assess potential risks and protect public health.

Escherichia coli (E. coli)

We achieved excellent health performance in 2016/17 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 compliance details for each drinking water supply scheme are provided in Appendix A, including the month-by-month performance.

Health-related chemical assessment

We use a risk management approach to determine how we monitor drinking water quality. During the risk assessment process, we identify substances, over and above regulatory requirements, to be monitored that may pose a risk to public health or influence optimal water quality characteristics. The VMP checks and analyses these substances, which are routinely trended and assessed against ADWG health-related limits and operational control triggers.

We are pleased to report all drinking water supply schemes complied with the health-related limits described in the ADWG, using the 95th percentile (95th-%ile) calculation.

Health-related chemical assessment compliance details are provided in Appendix B.

CHAPTER 3: MANAGING SAFE DRINKING WATER

Aesthetic assessment

Our routine VMP underpins our ability to verify the supply of safe drinking water to our customers. We take advantage of the program to also assess non-health related parameters which contribute to the way the water tastes, smells and appears. We understand these physical aspects of drinking water are important in enriching the quality of life. In 2016/17, all 12 drinking water supply schemes performed within the ADWG aesthetic guideline values.

The aesthetic assessment details are provided in Appendix C.

Overall assessment

For 2016/17, Queensland Urban Utilities met the prescribed health-related and aesthetic standards for all 12 drinking water schemes.

Table 1 summarises how our drinking water schemes performed against the legislative requirements between 1 July 2016 to 30 June 2017.

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 2016 – 30 June 2017.

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 health criteria as specified in the ADWG.

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

During 2016/17, Queensland Urban Utilities had cause to notify the Regulator on 11 occasions, as shown in Figure 5. Ten of these reported notifications involved the detection of *E. coli* in a water sample. In all cases, the follow-up samples indicated no continued presence of *E. coli*. The remaining notification was related to the detection of Manganese in the Ipswich region. For details on how we managed these incidents refer to *Chapter 7 – Water quality performance by region*.

Notifications to the Regulator

E. coli (10)

Manganese (1)

Local government area	*E. coli*	Chemical
Brisbane	5	-
Ipswich	2	1
Lockyer Valley	3	-
Scenic Rim	-	-
Somerset	-	-
TOTAL	**10**	**1**

Figure 5: Queensland Urban Utilities' notifications to the Regulator 2016/17.

The number of water quality incidents recorded for 2016/17 is the lowest number recorded in a financial year since Queensland Urban Utilities formed on 1 July 2010. Over the last three years, we have realised a 42% decrease in notifications to the Regulator (see Figure 6).

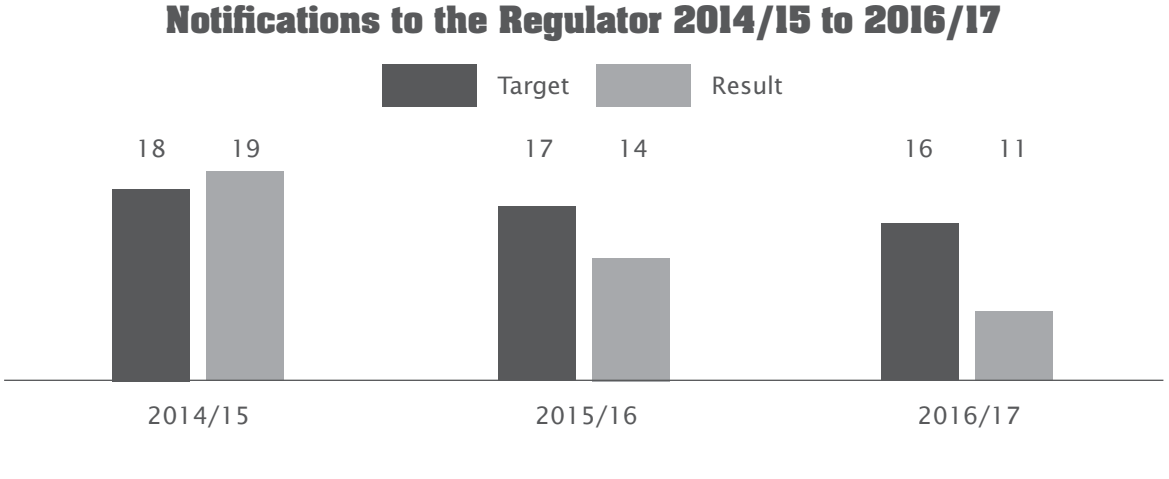


Figure 6: Queensland Urban Utilities' notifications to the Regulator 2014/15 to 2016/17.

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

During 2016/17, Queensland Urban Utilities completed a water quality hazard identification assessment of all in-service reservoirs. This assessment was based on guiding principles that targeted key risks (external and internal) for reservoirs, such as stormwater roof run-off, or pest and vermin entry. The assessment also incorporated historical water quality operational data and network water age from previous water quality modelling studies.

From this, a targeted water safety improvements strategy was developed for reservoir roofs. In 2016/17, Queensland Urban Utilities completed 10 high priority reservoir inspections and established a rolling program for continuous improvement. An outcome based, 'water tightness' approach was implemented to ensure all reservoir roof-related improvement works were completed to ensure the safety of the stored water. This approach incorporated an innovative roof flood testing procedure which captured performance before and after works were completed.

The roof flood testing of our reservoirs has been so effective, that Queensland Urban Utilities has also adopted this methodology as part of our enhanced asset condition assessment program for reservoirs.

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 2016/17, this program of works included the rehabilitation of 11 reservoirs, including installation of new reservoir roofs, and repairs to floor and wall joints. New reservoirs were also installed at Kooralbyn, Rathdowney and Mt Coot-tha, with the old reservoir assets at these sites removed.

Our capital program also included the renewal of 26 kilometres of water mains in 2016/17. 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 the continued water quality.

Water quality performance monitoring improvement

Queensland Urban Utilities has installed a fleet of devices at key locations throughout our water supply system to continuously monitor our water quality disinfection. These devices are battery powered and connect via mobile phone technology to provide instant information on the quality of our disinfection. This allows us to respond quickly to any changes in our disinfection quality and initiate remedial actions. We can also easily relocate the field devices or deploy additional units as required in order to investigate any reduced performance areas and formulate optimal solutions to improve the water quality disinfection.

Improved reservoir disinfection reliability

During 2016/17, Queensland Urban Utilities implemented improvements to the consistency, reliability and quality of our disinfection through the installation of tablet chlorination at identified regional isolated water supply reservoirs. These disinfection units, together with the field water quality devices installed at these remote locations, allows us to consistently provide safe drinking water in our most remote water supply schemes.

Disinfection by-product monitoring program

Disinfection by-products can form when disinfectants, such as chlorine, react with naturally present organic matter in the water. The ADWG limits the amount of disinfection by-products allowed in the drinking water supply as they are a risk to human health at elevated levels. Queensland Urban Utilities is committed to ensuring our drinking water supply minimises any formation of disinfection by-products to well below the health limits specified in the ADWG. This is achieved through a management framework of increased sampling and monitoring, flushing programs and reservoir aeration at key locations during the summer season.

Collaborating to optimise the South East Queensland water supply system

In 2016/17, we continued to collaborate with other South East Queensland water supply system operators to participate in the Regional Secondary Disinfection Optimisation Project (RSDOP) to optimise whole-of-system secondary disinfection. In 2016/17, the project developed the South East Queensland regional water quality model, which will be used in 2017/18 to validate options proposed in the *South East Queensland Water Supply Disinfection Improvement Plan*.

During 2016/17, the *SEQ Partnership Drinking Water Quality Management Plan* was also developed and endorsed. This plan outlines a catchment-to-tap based water quality leading-practice approach to provide cross organisational risk management across the entire South East Queensland Water Supply System. The plan also provides improved understanding, and establishes an agreed position on the public health performance targets

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 and sewerage 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 problems and trends and to assist in determining priorities for improving drinking water quality,
- undertaking sampling and chemical analysis for new potential contaminants of concern,
- 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), Water Environment Research Foundation (WERF) and American Water Works Association Research Foundation (AWWARF).

Other initiatives

- Prepared a design specification for water storage reservoirs that addresses water quality issues.
- Developed an internal audit program to check the integrity of storage reservoirs, which includes water quality security.
- Incorporated re-chloramination capabilities into the design of a new storage tank at Rochedale South. When completed we will have the capacity to develop efficient methods to re-chloraminate the water in the South East Queensland water supply system.
- Continued to improve protective security across our water supply assets, including development of a new protective security policy, preparing a protective security master plan and expanding security risk assessments across reservoir assets.
- Continued to incorporate water quality and water age modelling in the master plan process for Kuraby, Mt Crosby South, Beaudesert and Lowood water supply zones.

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 transformation into an innovative and customer focused 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 networks.

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.

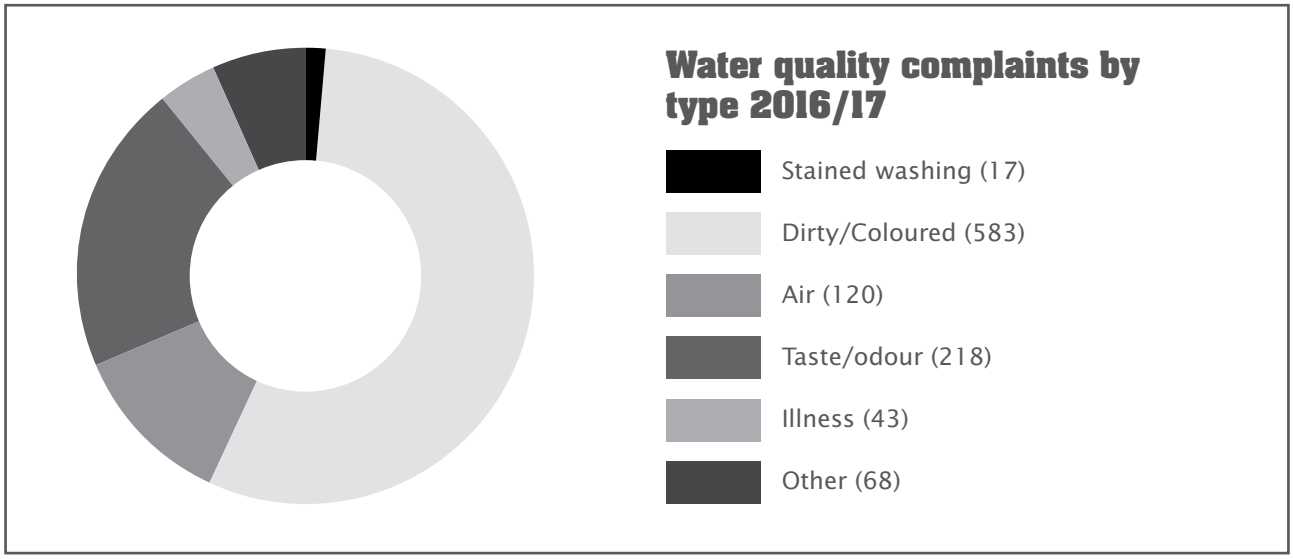
In 2016/17, Queensland Urban Utilities received 1,049 water quality complaints.

The majority of complaints (55%) 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.

This year, taste and odour complaints accounted for 21% of complaints received. These complaints can vary widely based on the customer's perception. The most common complaint descriptions included chlorine, metallic and chemical tastes. 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, by testing the customer's tap. During 2016/17, 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.



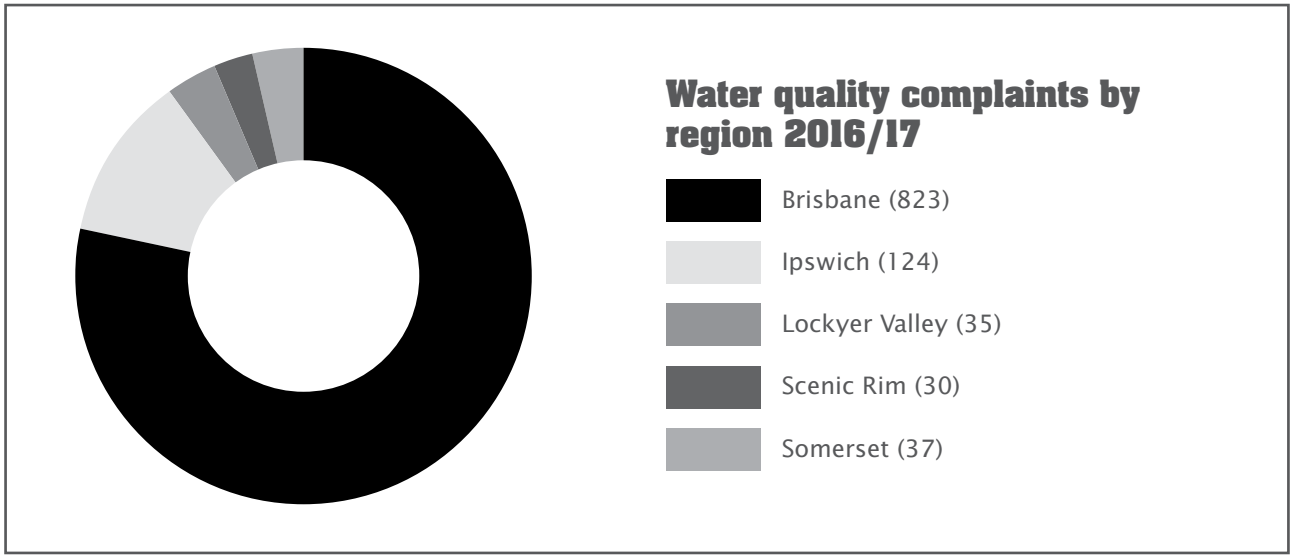


Figure 7: Water quality complaints by type and region – 2016/17.

CHAPTER 6: CUSTOMER SATISFACTION

Figure 8 shows Queensland Urban Utilities' performance against its Customer Service Standard (CSS), and a comparison with comparable water service providers across Australia with similar complexities and risks relating to the supply of drinking water.

Our CSS outlines commitments, responsibilities and standards that our customers can expect from us in relation to the water we provide. In 2016/17, our service standard for water quality was less than or equal to eight water quality complaints per 1,000 properties per year. We remained well under the customer service standard for 2016/17.

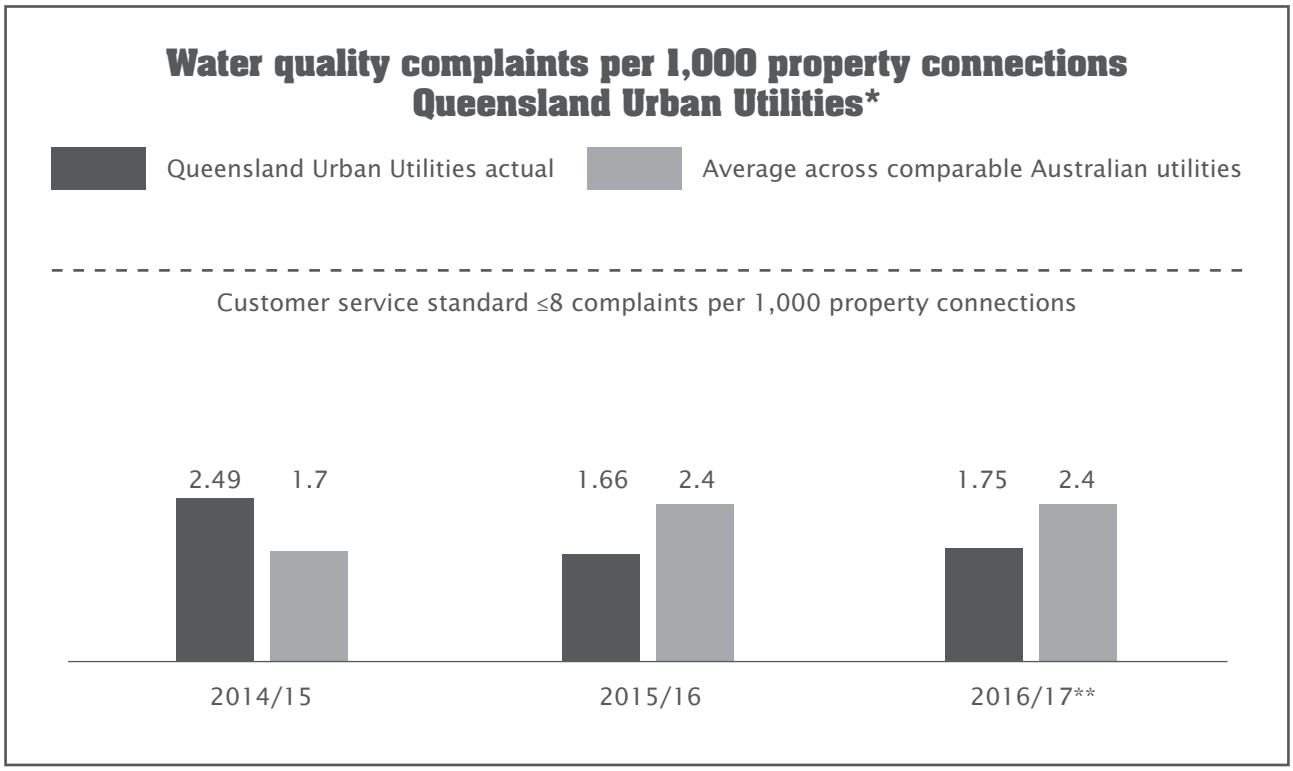


Figure 8: Water quality complaints per 1,000 property connections 1 July 2014 to 30 June 2017.

*The value for comparable Australian Utilities is sourced from the Bureau of Meteorology's *National performance report (NPR) 2015-16: urban water utilities PART A*, Table A10: C9 – Water quality complaints, by utility size group (100,000+ customers).

** NPR data for 2016/17 is not yet available as a result the NPR result for 2015/16 has been used.

CHAPTER 7: WATER QUALITY PERFORMANCE BY REGION

Brisbane region

The South East Queensland Water Supply Scheme supplies drinking water to our customers in Brisbane[1]. 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 2016/17, five 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 three years.

Date	Type	Location	Description	Preventative and corrective actions
4/1/17	*E. coli*	Grovely	The first non-compliance was a detection of *E. coli* from a routine sample taken on 4/1/17 at SP264. 6MPN *E. coli* organisms per 100mL was detected. Follow up samples indicated no continued presence of *E. coli*.	Grovely 2 reservoir required major roof works. Once complete, the roof was flood tested to stress test works before acceptance. Vermin proofing enhancements and gutter improvement have been applied. Grovely 2 reservoir is now equipped with online chlorine monitoring.
26/1/17	*E. coli*	Chapel Hill	The non-compliance was a detection of *E. coli* from a routine sample taken on 25/1/17 at SP225. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples indicated no continued presence of *E. coli*.	Chapel Hill reservoir required minor works to rectify rainwater ingress points. Chapel Hill reservoir is now equipped with online chlorine monitoring. Future works are planned to install reflux valves on site to optimise site disinfection concentrations.
1/2/17	*E. coli*	Mitchelton	The non-compliance was a detection of *E. coli* from a routine sample taken on 1/2/17 at SP231. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples indicated no continued presence of *E. coli*.	Mitchelton reservoir was flood tested to identify rainwater ingress points. Ingress points have been sealed and additional precautionary works conducted. Continuous online monitoring has been installed on the reservoir outlet. Further network improvements will be investigated.
13/4/17	*E. coli*	Chapel Hill	The non-compliance was a detection of *E. coli* from a routine sample taken on 12/4/17 at SP226. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples indicated no continued presence of *E. coli*.	In collaboration with our bulk water supplier, Seqwater, we are undertaking further development of site specific, disinfection targets and corrective actions to detect disinfection levels, and alert when levels are outside normal operational parameters.
21/4/17	*E. coli*	Grovely	The non-compliance was a detection of *E. coli* from a routine sample taken on 20/4/17 at SP264. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples indicated no continued presence of *E. coli*.	In collaboration with our bulk water supplier, Seqwater, we are undertaking further development of site specific, disinfection targets and corrective actions to detect disinfection levels, and alert when levels are outside normal operational parameters.

Table 2: Notifications to the Regulator – Brisbane: 1 July 2016 to 30 June 2017.

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

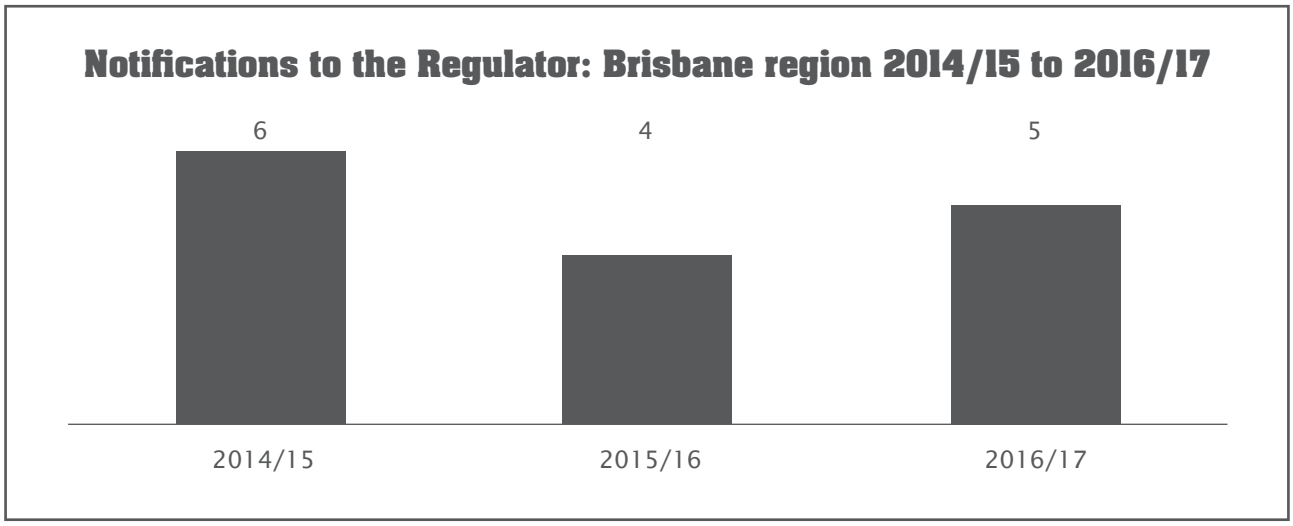


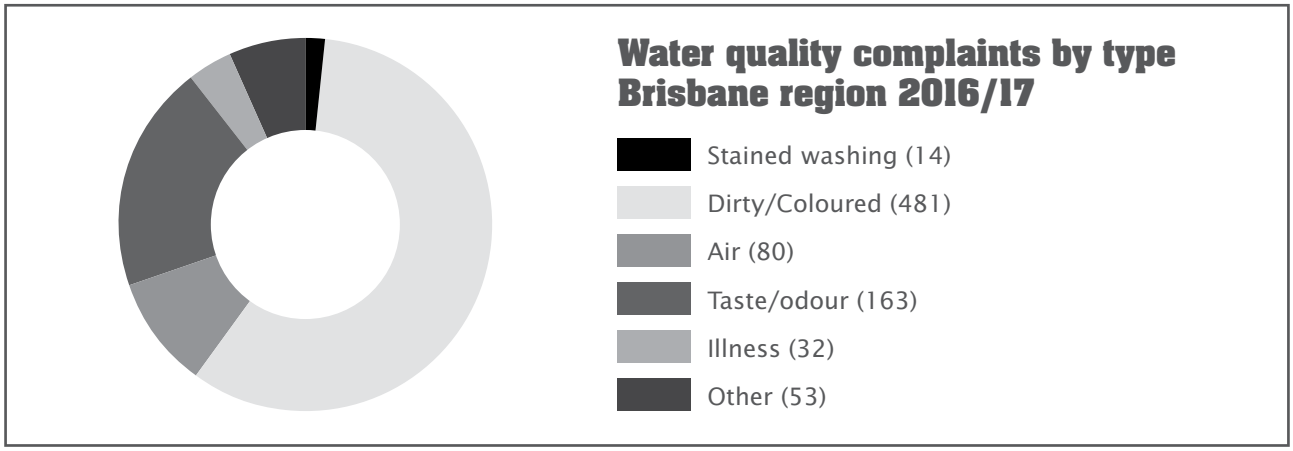
Figure 9: Notifications to the Regulator – Brisbane: 1 July 2014 to 30 June 2017.

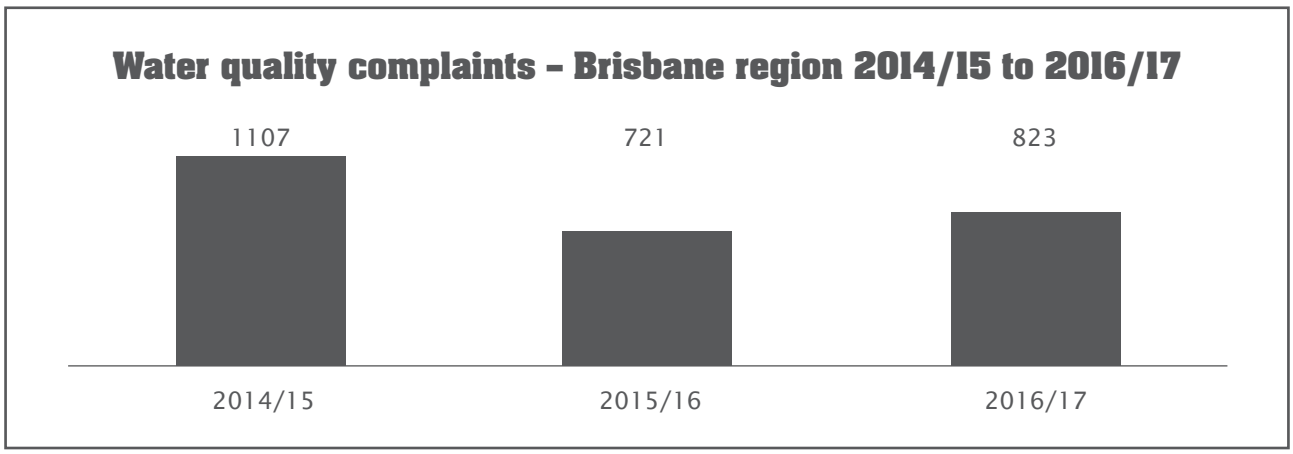
CHAPTER 7: WATER QUALITY PERFORMANCE BY REGION

Brisbane region (continued)

Customer satisfaction

In 2016/17, Queensland Urban Utilities investigated 823 water quality complaints in the Brisbane region. This result is a 14% increase (102 complaints) on the number of water quality complaints received in 2015/16. The majority of these complaints can be attributed to adverse weather conditions experienced in 2017. Despite this increase in water quality complaints, Queensland Urban Utilities remained well under the customer service standard of ≤8 complaints per 1,000 property connections.





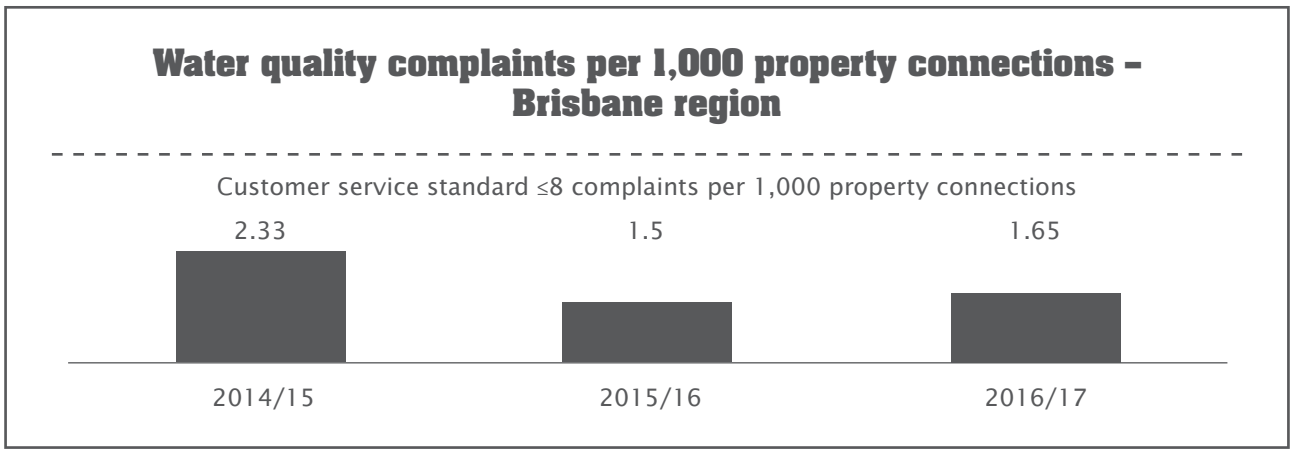


Figure 10: Customer satisfaction – Brisbane region.

CHAPTER 7: WATER QUALITY PERFORMANCE BY 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 2016/17, three incidents occurred in the Ipswich region, which required advice to the Regulator. Table 3 summarises these notifications and how we responded to the event.

Date	Type	Location	Description	Preventative and corrective actions
16/12/16	*E. coli*	Blackstone	The non-compliance was a detection of *E. coli* from a routine sample taken on 16/12/16 at SP829. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples indicated no continued presence of *E. coli*.	Online disinfection monitoring has been installed. We will use the data to inform disinfection improvement opportunities.
17/1/17	*E. coli*	Ashwell	The non-compliance was a detection of *E. coli* from a routine sample taken on 17/1/17 at SP404. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples indicated no continued presence of *E. coli*.	To improve disinfection concentrations a schedule of flushing at the end of this water main has been implemented.
15/5/17	Chemical	Riverview	The non-compliance was a detection of Manganese from a routine sample taken on 5/5/17 at SP420. 0.59mg/L Manganese was detected.	Likely cause is localised event without reported customer impact. Further sampling showed event had passed.

Table 3: Notifications to the Regulator – Ipswich: 1 July 2016 to 30 June 2017

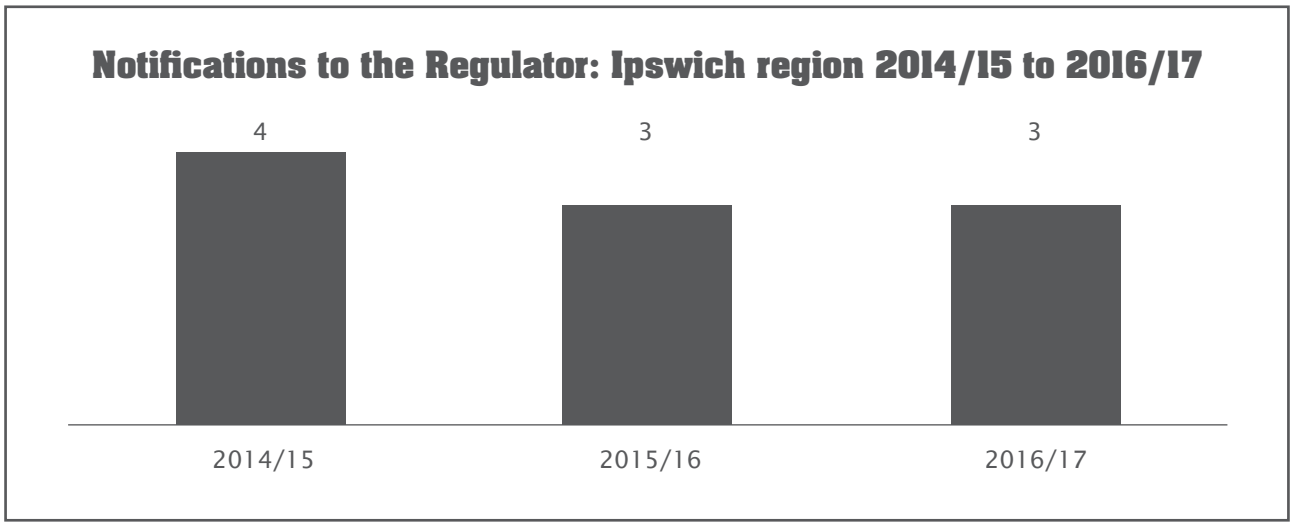
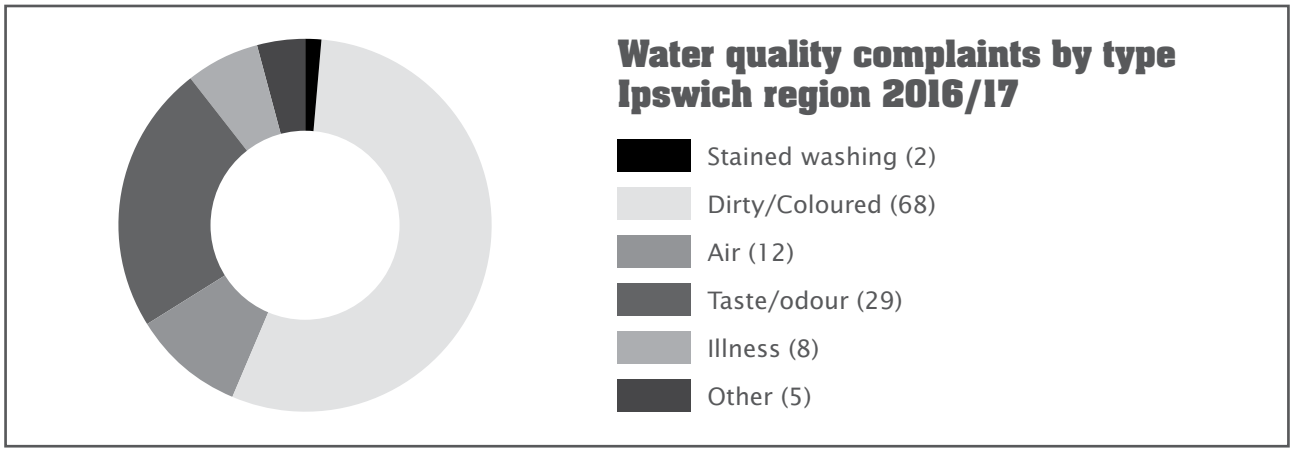


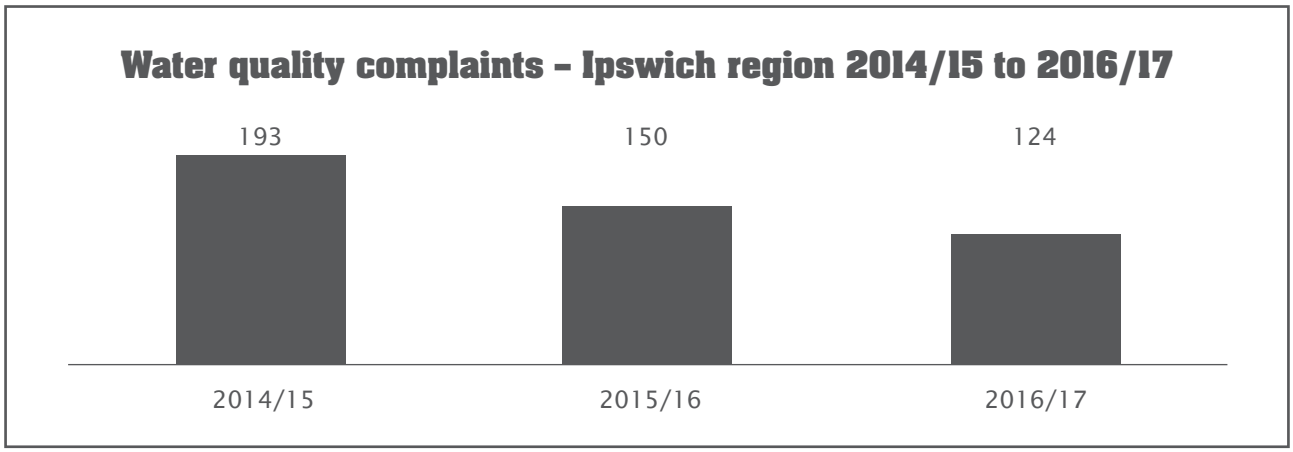
Figure 11: Notifications to the Regulator – Ipswich region: 1 July 2014 to 30 June 2017.

[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.

Customer satisfaction

In 2016/17, Queensland Urban Utilities investigated 124 water quality complaints in the Ipswich region. This is a 17% decrease on the number of water quality complaints received in 2015/16, and the lowest recorded in the last three years. We also continued to see improvement in performance against the customer service standard of ≤8 complaints per 1,000 property connections.





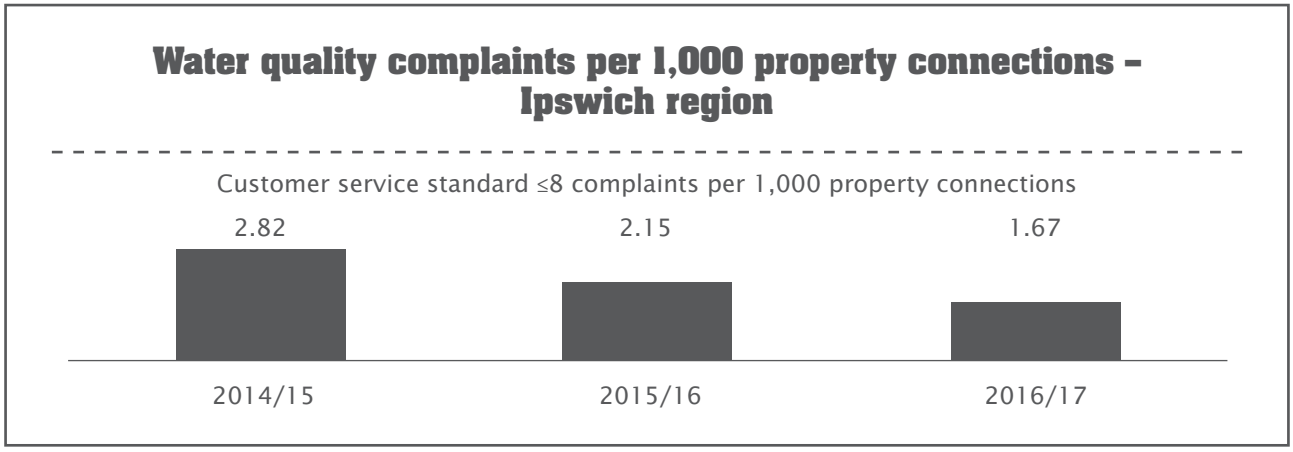


Figure 12: Customer satisfaction – Ipswich region.

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 2016/17, three incidents occurred in the Lockyer Valley region, which required advice to the Regulator. Table 4 summarises these notifications and how we responded to the event.

Date	Type	Location	Description	Preventative and corrective actions
18/11/16	*E. coli*	Grantham	The non-compliance was a detection of *E. coli* from a routine sample taken on 18/11/16 at SP697. 1MPN *E. coli* organisms per 100mL was detected. Follow up samples indicated no continued presence of *E. coli*.	Grantham reservoir required minor roof works to prevent rainwater ingress. Vermin protection was installed on the overflow. Grantham reservoir now has active re-chlorination and online chlorine monitoring.
16/12/16	*E. coli*	Forest Hill	The non-compliance was a detection of *E. coli* from a routine sample taken on 16/12/16 at SP683. 2MPN E. coli organisms per 100mL was detected. Follow up samples indicated no continued presence of *E. coli*.	Forest Hill reservoir hatch was replaced to address suspected rainwater ingress points. Active re-chlorination and field-based chlorine monitoring has been installed at Forest Hill reservoir.
28/3/17	*E. coli*	Forest Hill	The non-compliance was a detection of *E. coli* from a routine sample taken on 28/3/17 at SP683. 3MPN *E. coli* organisms per 100mL was detected. Follow up samples indicated no continued presence of *E. coli*.	Flood testing of the roof identified points of ingress not detected during the December 2016 incident. Parallel to the flood testing, opportunities for structural improvements were identified. The reservoir has been taken offline until water proofing and the additional improvements have been completed.

Table 4: Notifications to the Regulator – Lockyer Valley: 1 July 2016 to 30 June 2017.

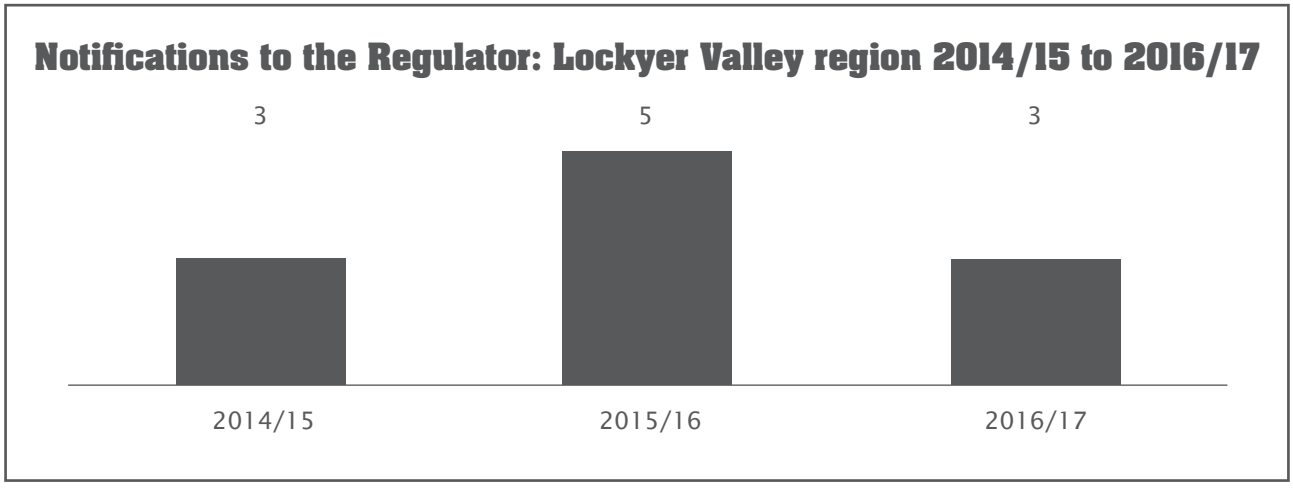
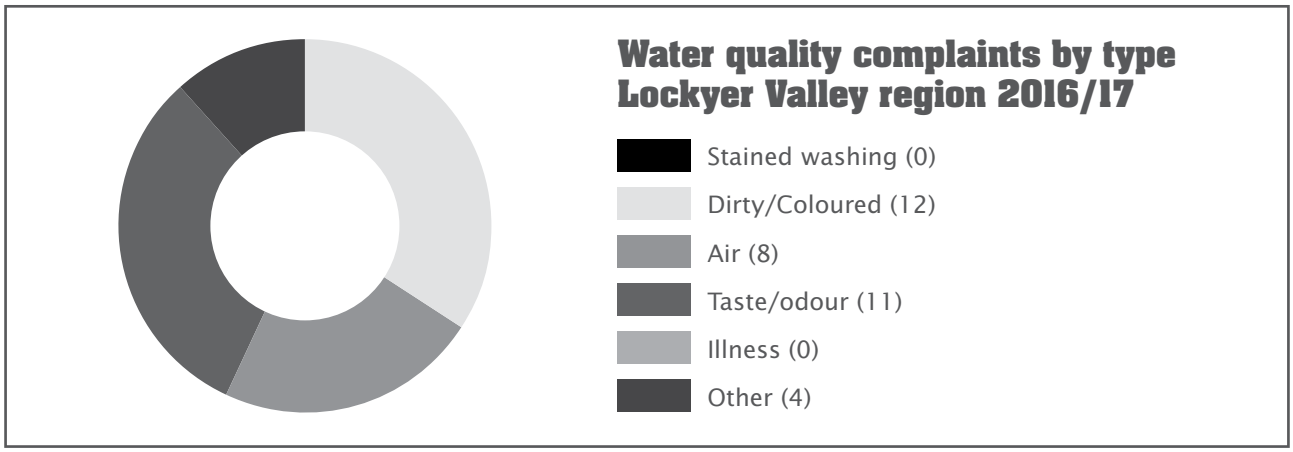
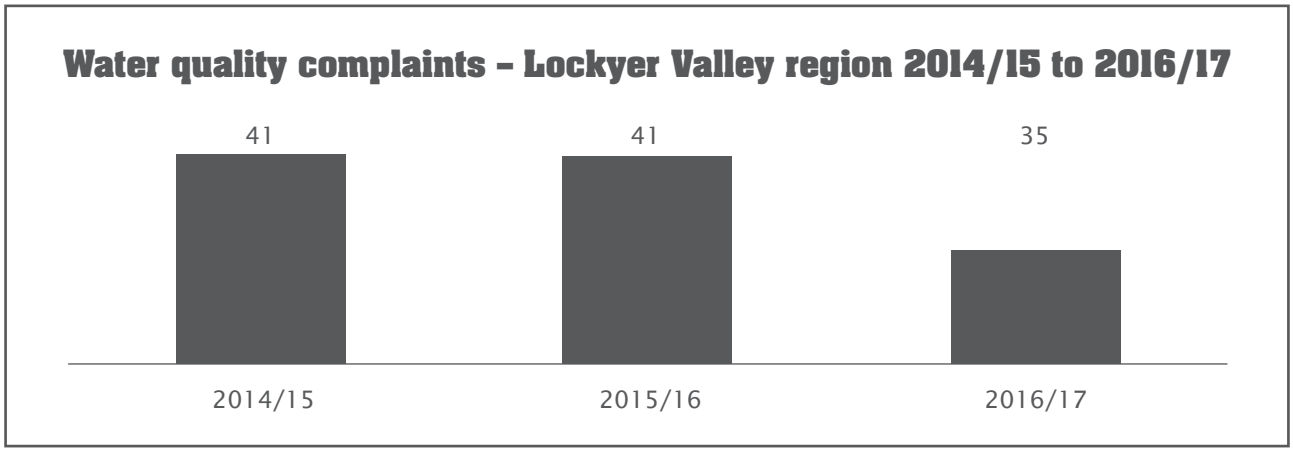


Figure 13: Notifications to the Regulator – Lockyer Valley region: 1 July 2014 to 30 June 2017.

Customer satisfaction

In 2016/17, Queensland Urban Utilities investigated 35 water quality complaints in the Lockyer Valley region. This is a 15% decrease on the number of water quality complaints received in 2015/16, and the lowest recorded in the last three years. We also saw improvement in performance against the customer service standard of ≤8 complaints per 1,000 property connections.





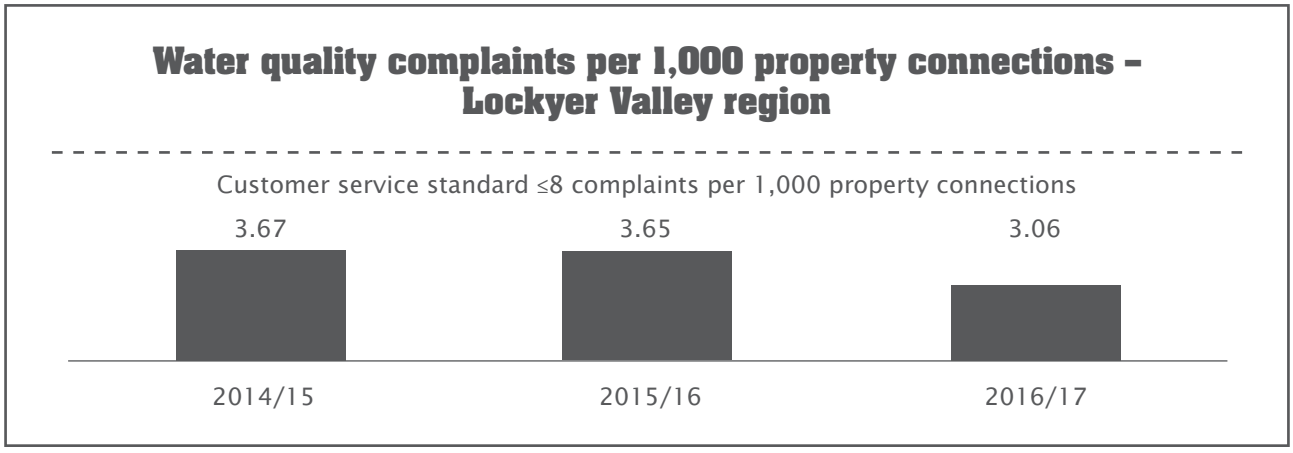


Figure 14: Customer satisfaction – Lockyer Valley region.

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 2016/17, there were no incidents in the Scenic rim region that required advice to the Regulator. This is the first time in three years Queensland Urban Utilities has achieved this outcome.

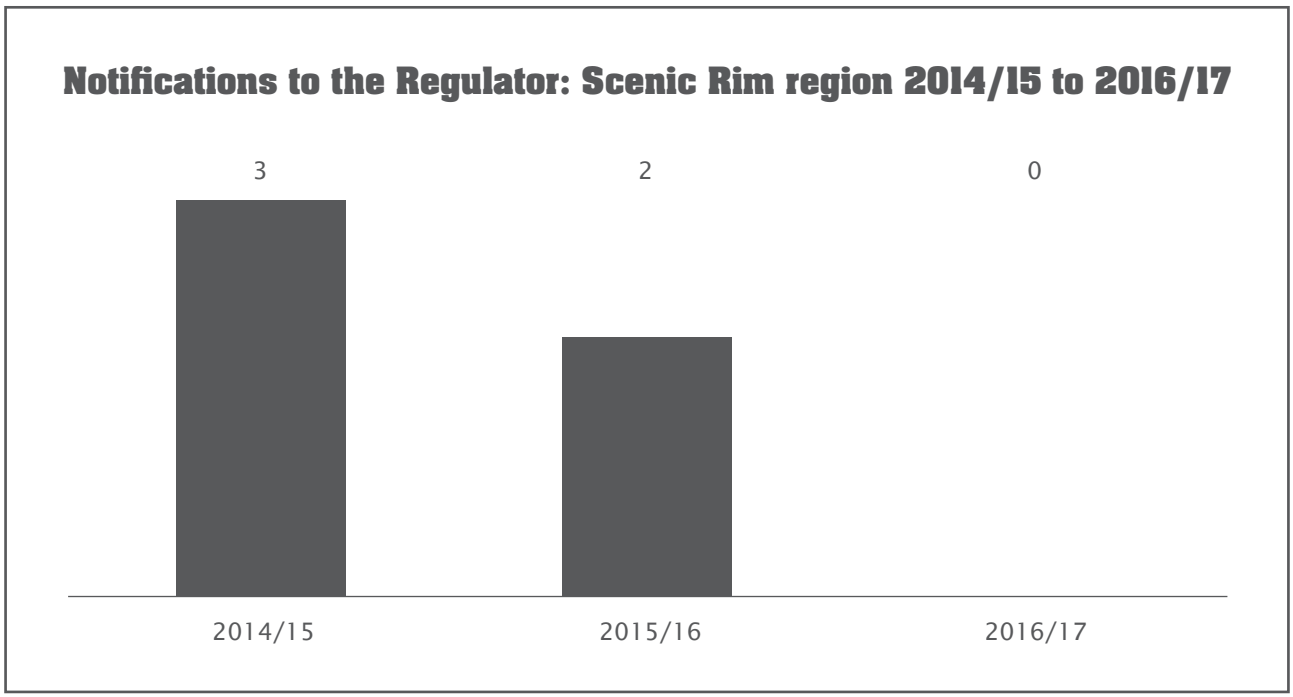
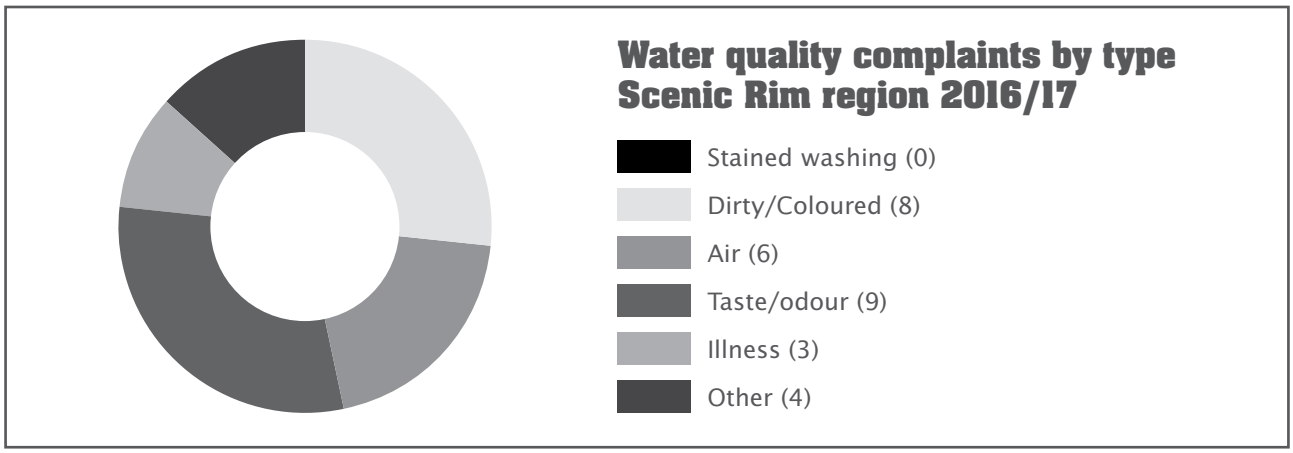
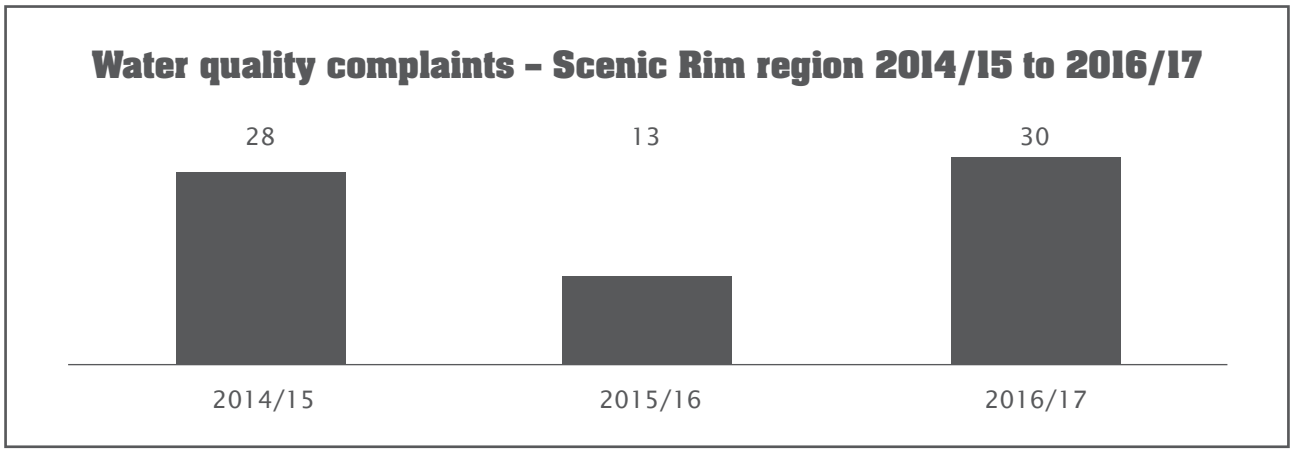


Figure 15: Notifications to the Regulator – Scenic Rim region: 1 July 2014 to 30 June 2017.

Customer satisfaction

In 2016/17, Queensland Urban Utilities investigated 30 water quality complaints in the Scenic Rim region. This is an increase of 17 complaints on the number of water quality complaints received in 2015/16, which can be attributed to the adverse weather conditions experienced in 2017. Despite the increase in water quality complaints in the Scenic Rim region in 2016/17, Queensland Urban Utilities remained well under the customer service standard of ≤8 complaints per 1,000 property connections.





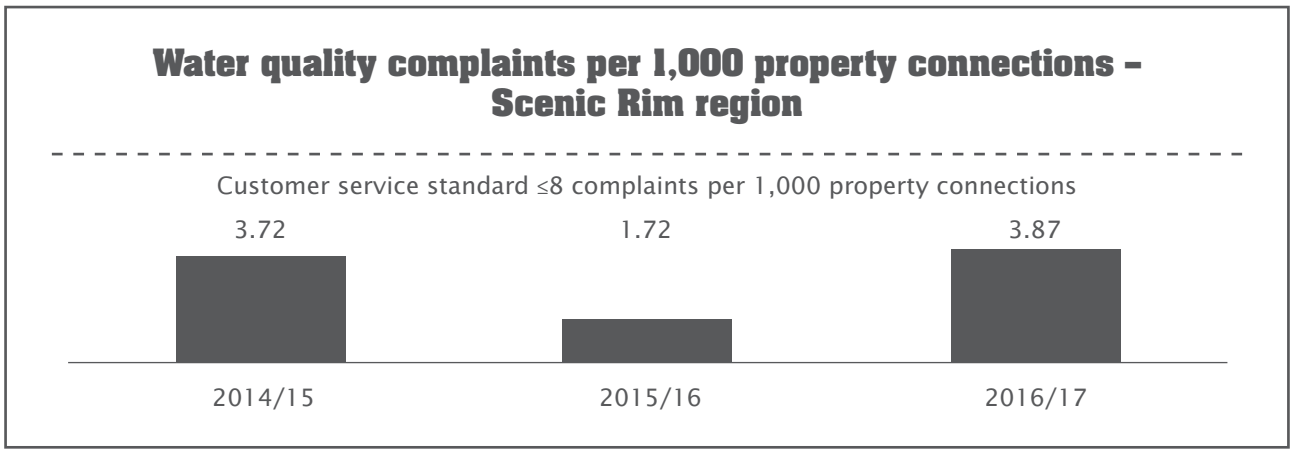


Figure 16: Customer satisfaction – Scenic Rim region.

CHAPTER 7: WATER QUALITY PERFORMANCE BY 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 2016/17, there were no incidents in the Somerset region that required advice to the Regulator. This is the second consecutive year Queensland Urban Utilities has achieved this result.

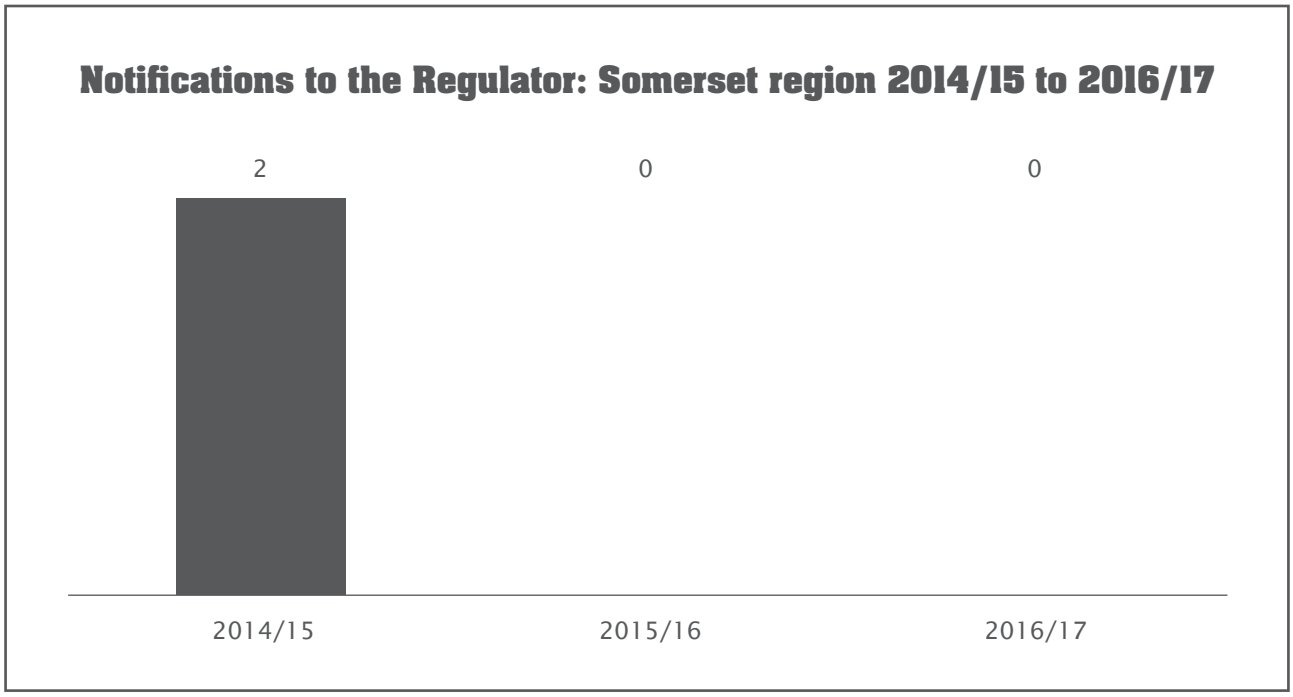
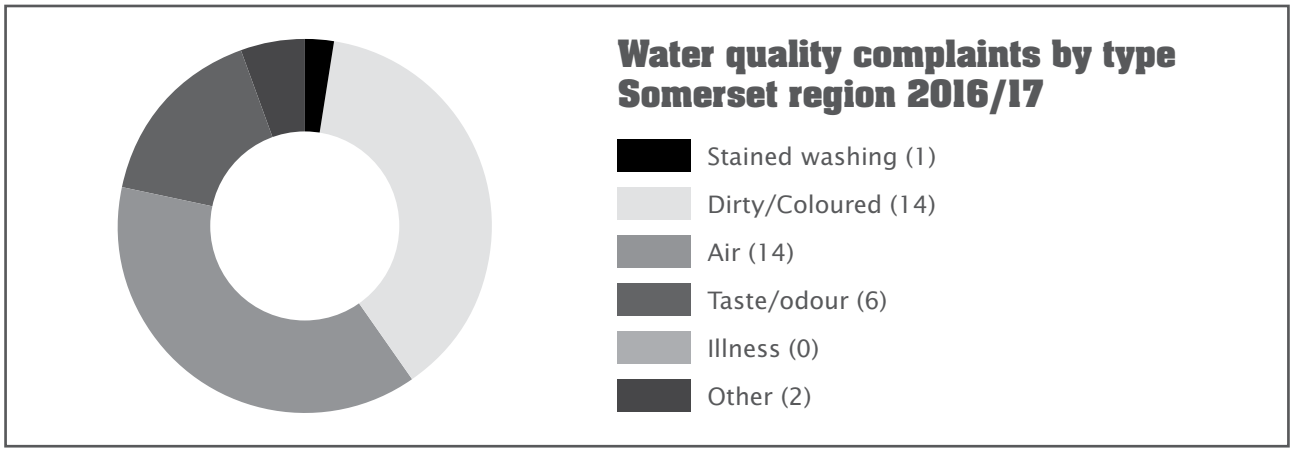
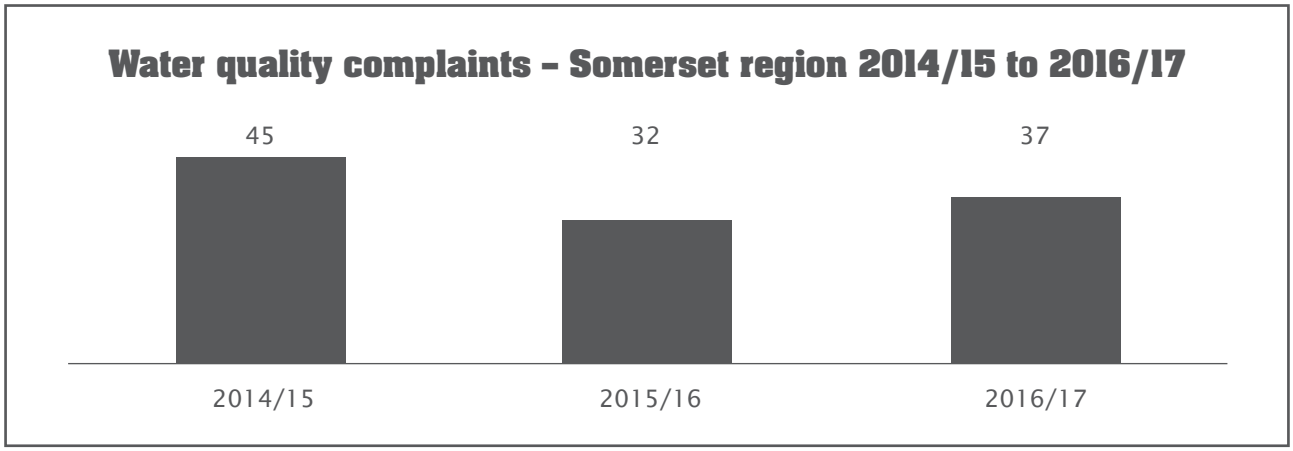


Figure 17: Notifications to the Regulator – Scenic Rim region: 1 July 2014 to 30 June 2017.

Customer satisfaction

In 2016/17, Queensland Urban Utilities investigated 37 water quality complaints in the Scenic Rim region. The small increase can be attributed to dirty water caused by maintenance activity on our water distribution network. Despite this small increase, we remained under the customer service standard of ≤8 complaints per 1,000 property connections.





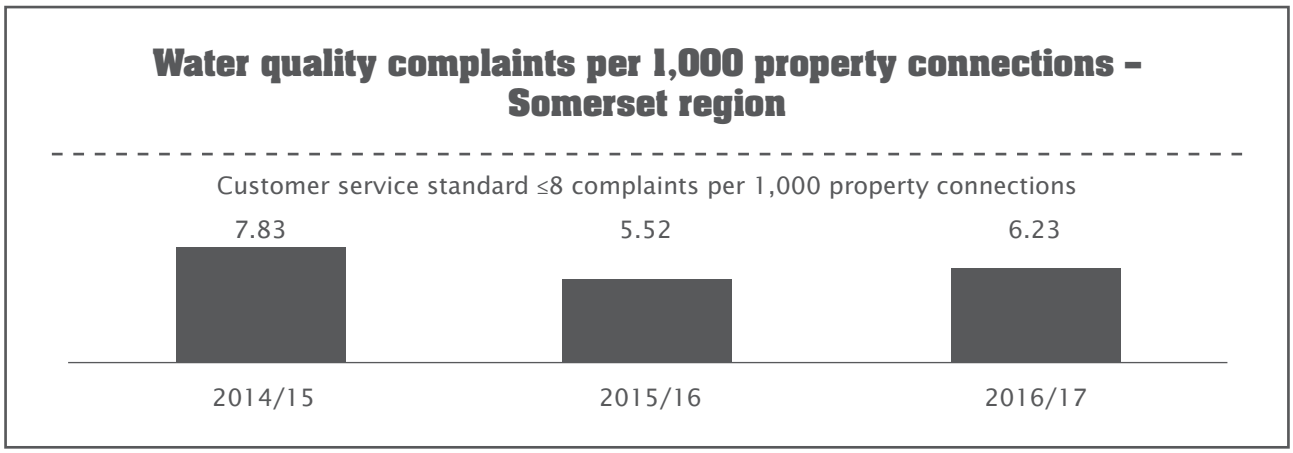


Figure 16: Customer satisfaction – Scenic Rim region.

CHAPTER 8: AUDIT AND REVIEW OF THE DRINKING WATER QUALITY MANAGEMENT PLAN

DWQMP regular audit

In accordance with section 11.1 of the *Information Notice* for approval of Queensland Urban Utilities' DWQMP (2013), an audit (Regular Audit) of the DWQMP is required every four years from the date of approval, with the first Regular Audit to be completed by 19 January 2017. The first Regular Audit was completed by the due date.

The purpose of the regular DWQMP report audit is to:

- verify the accuracy of the monitoring and performance data provided to the Regulator under the plan,
- assess the service provider's compliance with the plan, and
- assess the relevance of the plan in relation to the provider's drinking water service.

Audit outcome

Viridis Consultants Pty Ltd (Viridis) was engaged by Queensland Urban Utilities to undertake the first regular audit of the DWQMP.

Against the 11 areas for assessment, nine were assessed as compliant, two areas of improvement were noted and no major non-conformances were identified.

The two areas of improvement related to the implementation of operational and maintenance procedures for checking chemical deliveries and undertaking reservoir inspections.

In response, Queensland Urban Utilities has:

- implemented a process to check the quality and suitability of drinking water chemicals, including a process for receipting chemicals, and
- introduced measures to ensure that where parts of a site cannot be accessed, the inspection process ensures hazards are identified and reported.

The audit concluded that Queensland Urban Utilities has demonstrated a very high level of compliance with its DWQMP. The audit also found that Queensland Urban Utilities is implementing its DWQMP effectively and managing risks to drinking water quality and public health.

DWQMP regular review

In line with section 11.1 of the *Amendment Information Notice* for approval of Queensland Urban Utilities' DWQMP (2015), Queensland Urban Utilities was required to complete a review of its DWQMP by 16 January 2017. This review was completed by the due date.

The purpose of the review is to ensure the plan remains relevant, having regard for the current circumstances and operation of the water service. Specifically, the review is to:

- ensure the plan is relevant, accurate and current in terms of the operating environment and implementation,
- identify any improvements required to ensure the drinking water remains protective of public health and meets the water quality criteria, and
- fulfil the statutory requirement for undertaking the regular review.

It is also a requirement for water service providers to include the outcomes of their DWQMP review, and how they addressed any matters raised in the review, in their annual report for the financial year of the review.

Review outcome

The review concluded that the DWQMP framework is being implemented, and the commitment to continuous improvement is visible. Queensland Urban Utilities has complied with the DWQMP water quality criteria, indicating the delivery of safe, quality water to customers.

The improvement actions identified in the approved DWQMP are being implemented. The management of incidents has been effective, with lessons learned being used to improve processes, and the monitoring program has been revised to ensure it remains relevant and representative.

The review concluded that the DWQMP is largely current with very minor edits required.

However, based on Queensland Urban Utilities' review of its VMP and DWQMP risk assessment, we will submit the revised DWQMP to the Regulator for re-approval in November 2017.

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	370	0	98	100	☑
Boonah-Kalbar	52	357	0	98	100	☑
Canungra	52	106	0	98	100	☑
Esk-Toogoolawah	52	104	0	98	100	☑
Jimna	12	52	0	98	100	☑
Kilcoy	52	104	0	98	100	☑
Kooralbyn	52	212	0	98	100	☑
Linville	12	52	0	98	100	☑
Lowood	124	1560	3	98	99.8	☑
Rathdowney	12	53	0	98	100	☑
Somerset	12	52	0	98	100	☑
SEQ Water Supply Scheme	1728	8204	7	98	99.7	☑

Beaudesert *E.coli*						
Scheme	**Number of samples required**	**Actual number of samples**	**Number of samples *E. coli* detected**	**Required performance %**	**Actual performance %**	***E. coli* Compliant**
July	5	35	0	98	100	☑
August	6	28	0	98	100	☑
September	5	35	0	98	100	☑
October	5	34	0	98	100	☑
November	6	21	0	98	100	☑
December	5	35	0	98	100	☑
January	6	28	0	98	100	☑
February	5	35	0	98	100	☑
March	5	28	0	98	100	☑
April	5	28	0	98	100	☑
May	6	28	0	98	100	☑
June	5	35	0	98	100	☑

Boonah-Kalbar *E.coli*						
Scheme	**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	4	28	0	98	100	☑
November	5	35	0	98	100	☑
December	4	28	0	98	100	☑
January	5	28	0	98	100	☑
February	4	28	0	98	100	☑
March	4	28	0	98	100	☑
April	4	28	0	98	100	☑
May	5	28	0	98	100	☑
June	4	35	0	98	100	☑

Canungra *E.coli*						
Scheme	**Number of samples required**	**Actual number of samples**	**Number of samples *E. coli* detected**	**Required performance %**	**Actual performance %**	***E. coli* Compliant**
July	4	10	0	98	100	☑
August	5	8	0	98	100	☑
September	4	10	0	98	100	☑
October	4	10	0	98	100	☑
November	5	6	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	8	0	98	100	☑
June	4	10	0	98	100	☑

APPENDICES

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

Esk-Toogoolawah *E.coli*						
Scheme	**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	4	8	0	98	100	☑
November	5	10	0	98	100	☑
December	4	8	0	98	100	☑
January	5	10	0	98	100	☑
February	4	6	0	98	100	☑
March	4	10	0	98	100	☑
April	4	8	0	98	100	☑
May	5	10	0	98	100	☑
June	4	8	0	98	100	☑

Jimna *E.coli*						
Scheme	**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	5	0	98	100	☑
December	1	4	0	98	100	☑
January	1	5	0	98	100	☑
February	1	3	0	98	100	☑
March	1	5	0	98	100	☑
April	1	4	0	98	100	☑
May	1	5	0	98	100	☑
June	1	4	0	98	100	☑

Kilcoy *E.coli*						
Scheme	**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	4	8	0	98	100	☑
November	5	10	0	98	100	☑
December	4	8	0	98	100	☑
January	5	10	0	98	100	☑
February	4	6	0	98	100	☑
March	4	10	0	98	100	☑
April	4	8	0	98	100	☑
May	5	10	0	98	100	☑
June	4	8	0	98	100	☑

Kooralbyn *E.coli*						
Scheme	**Number of samples required**	**Actual number of samples**	**Number of samples *E. coli* detected**	**Required performance %**	**Actual performance %**	***E. coli* Compliant**
July	4	20	0	98	99.5	☑
August	5	16	0	98	99.5	☑
September	4	20	0	98	99.5	☑
October	4	20	0	98	99.5	☑
November	5	12	0	98	100	☑
December	4	20	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	16	0	98	100	☑
June	4	20	0	98	100	☑

APPENDICES

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

Linville *E.coli*						
Scheme	**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	5	0	98	100	☑
December	1	4	0	98	100	☑
January	1	5	0	98	100	☑
February	1	3	0	98	100	☑
March	1	5	0	98	100	☑
April	1	4	0	98	100	☑
May	1	5	0	98	100	☑
June	1	4	0	98	100	☑

Lowood *E.coli*						
Scheme	**Number of samples required**	**Actual number of samples**	**Number of samples *E. coli* detected**	**Required performance %**	**Actual performance %**	***E. coli* Compliant**
July	10	124	0	98	99.8	☑
August	11	137	0	98	99.8	☑
September	10	134	0	98	99.8	☑
October	10	134	0	98	99.9	☑
November	11	131	1	98	99.9	☑
December	10	132	1	98	99.8	☑
January	11	131	0	98	99.8	☑
February	10	130	0	98	99.8	☑
March	10	123	1	98	99.7	☑
April	10	121	0	98	99.8	☑
May	11	143	0	98	99.8	☑
June	10	128	0	98	99.8	☑

Rathdowney *E.coli*						
Scheme	**Number of samples required**	**Actual number of samples**	**Number of samples *E.coli* detected**	**Required performance %**	**Actual performance %**	***E.coli* Compliant**
July	1	5	0	98	100	☑
August	1	4	0	98	100	☑
September	1	5	0	98	100	☑
October	1	5	0	98	100	☑
November	1	3	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	4	0	98	100	☑
June	1	5	0	98	100	☑

Somerset *E.coli*						
Scheme	**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	5	0	98	100	☑
December	1	4	0	98	100	☑
January	1	5	0	98	100	☑
February	1	3	0	98	100	☑
March	1	5	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*

South East Queensland Water Supply (Brisbane and Ipswich) *E.coli*						
Scheme	**Number of samples required**	**Actual number of samples**	**Number of samples *E.coli* detected**	**Required performance %**	**Actual performance %**	***E.coli* Compliant**
July	142	641	0	98	99.9	☑
August	148	665	0	98	99.9	☑
September	142	730	0	98	99.9	☑
October	142	666	0	98	99.9	☑
November	148	703	0	98	99.9	☑
December	142	699	1	98	99.9	☑
January	148	703	4	98	99.8	☑
February	142	603	0	98	99.8	☑
March	142	739	0	98	99.9	☑
April	142	631	2	98	99.9	☑
May	148	742	0	98	99.9	☑
June	142	682	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	14	0	<0.001	<0.001	☑
Barium	mg/L	2	14	0	0.060	0.054	☑
Cadmium	mg/L	0.002	14	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	404	0	2.5	1.6	☑
Chlorine (Total)	mg/L	5	404	0	2.8	1.9	☑
Chromium	mg/L	0.05	14	0	<0.001	<0.001	☑
Copper	mg/L	2	14	0	0.007	0.006	☑
Fluoride	mg/L	1.5	14	0	1.0	0.98	☑
Lead	mg/L	0.01	14	0	0.001	0.001	☑
Manganese	mg/L	0.5	106	0	0.002	<0.001	☑
Nickel	mg/L	0.02	14	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	90	0	240	220	☑

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	0.025	0.024	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	357	0	3.3	1.8	☑
Chlorine (Total)	mg/L	5	357	0	3.5	2.1	☑
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	1	1.0	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	204	0	0.013	0.001	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	33	0	220	190	☑

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Appendix B: Water quality compliance – health assessment

Canungra Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	14	0	<0.001	<0.001	☑
Barium	mg/L	2	14	0	0.017	0.012	☑
Cadmium	mg/L	0.002	14	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	106	0	2.6	2.4	☑
Chlorine (Total)	mg/L	5	106	0	3.0	2.5	☑
Chromium	mg/L	0.05	14	0	<0.001	<0.001	☑
Copper	mg/L	2	14	0	0.004	0.003	☑
Fluoride	mg/L	1.5	14	0	1.1	0.81	☑
Lead	mg/L	0.01	14	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	53	0	0.004	0.002	☑
Nickel	mg/L	0.02	14	0	0.003	0.001	☑
Trihalomethanes (Total)	ug/L	250	14	0	98	97	☑

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	0.028	0.027	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	104	0	2.2	1.7	☑
Chlorine (Total)	mg/L	5	104	0	2.2	1.8	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.007	0.004	☑
Fluoride	mg/L	1.5	13	0	1.1	1.0	☑
Lead	mg/L	0.01	13	0	0.0016	<0.001	☑
Manganese	mg/L	0.5	104	0	0.009	0.003	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	13	0	170	170	☑

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	0.016	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	52	0	2.6	2.3	☑
Chlorine (Total)	mg/L	5	52	0	2.7	2.4	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.006	0.006	☑
Fluoride	mg/L	1.5	13	0	0.81	0.38	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	52	0	0.037	0.006	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	13	0	160	160	☑

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	0.02	0.02	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	104	0	1.6	1.2	☑
Chlorine (Total)	mg/L	5	104	0	1.7	1.4	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.005	0.005	☑
Fluoride	mg/L	1.5	13	0	0.99	0.94	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	52	0	0.25	0.021	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	13	0	180	140	☑

APPENDICES

Appendix B: Water quality compliance – health assessment

Kooralbyn Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	14	0	<0.001	<0.001	☑
Barium	mg/L	2	14	0	0.039	0.038	☑
Cadmium	mg/L	0.002	14	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	212	0	2.1	1.6	☑
Chlorine (Total)	mg/L	5	212	0	2.4	1.8	☑
Chromium	mg/L	0.05	14	0	<0.001	<0.001	☑
Copper	mg/L	2	14	0	0.003	0.002	☑
Fluoride	mg/L	1.5	14	0	1.0	0.98	☑
Lead	mg/L	0.01	14	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	53	0	0.045	0.003	☑
Nickel	mg/L	0.02	14	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	63	0	170	160	☑

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	0.020	0.019	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	52	0	4.0	3.2	☑
Chlorine (Total)	mg/L	5	52	0	4.4	3.4	☑
Chromium	mg/L	0.05	13	0	<0.001	<0.001	☑
Copper	mg/L	2	13	0	0.005	0.004	☑
Fluoride	mg/L	1.5	13	0	1.0	1.0	☑
Lead	mg/L	0.01	13	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	52	0	0.051	<0.001	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	13	0	110	110	☑

Lowood Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	103	0	<0.001	<0.001	☑
Barium	mg/L	2	103	0	0.035	0.032	☑
Cadmium	mg/L	0.002	103	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	1568	0	3.4	1.9	☑
Chlorine (Total)	mg/L	5	1568	0	3.6	2.2	☑
Chromium	mg/L	0.05	103	0	<0.001	<0.001	☑
Copper	mg/L	2	103	0	0.027	0.011	☑
Fluoride	mg/L	1.5	103	0	1.2	1.1	☑
Lead	mg/L	0.01	103	0	0.004	0.001	☑
Manganese	mg/L	0.5	592	0	0.040	0.005	☑
Nickel	mg/L	0.02	103	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	143	0	230	180	☑

Rathdowney Health Assessment							
Parameter	**Units**	**ADWG Health Guideline**	**Number of tests**	**Exceedance Count**	**Maximum Result**	**95th %-ile**	**Meets ADWG**
Arsenic	mg/L	0.01	14	0	<0.001	<0.001	☑
Barium	mg/L	2	14	0	0.074	0.074	☑
Cadmium	mg/L	0.002	14	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	53	0	1.8	1.2	☑
Chlorine (Total)	mg/L	5	53	0	2.0	1.6	☑
Chromium	mg/L	0.05	14	0	<0.001	<0.001	☑
Copper	mg/L	2	14	0	0.004	0.004	☑
Fluoride	mg/L	1.5	14	0	0.35	0.28	☑
Lead	mg/L	0.01	14	0	<0.001	<0.001	☑
Manganese	mg/L	0.5	53	0	0.017	0.007	☑
Nickel	mg/L	0.02	14	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	21	0	200	200	☑

APPENDICES

Appendix B: Water quality compliance – health assessment

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	0.021	0.021	☑
Cadmium	mg/L	0.002	13	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	52	0	1.9	1.6	☑
Chlorine (Total)	mg/L	5	52	0	2.0	1.8	☑
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	0.14	0.12	☑
Lead	mg/L	0.01	13	0	0.001	0.001	☑
Manganese	mg/L	0.5	52	0	0.020	0.014	☑
Nickel	mg/L	0.02	13	0	<0.001	<0.001	☑
Trihalomethanes (Total)	ug/L	250	20	0	210	170	☑

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	158	0	<0.001	<0.001	☑
Barium	mg/L	2	158	0	0.035	0.028	☑
Cadmium	mg/L	0.002	158	0	<0.001	<0.001	☑
Chlorine (Free)	mg/L	5	1034	0	4.4	1.0	☑
Chlorine (Total)	mg/L	5	8204	0	4.8	2.2	☑
Chromium	mg/L	0.05	158	0	<0.001	<0.001	☑
Copper	mg/L	2	158	0	0.026	0.020	☑
Dichloroacetic Acid	ug/L	100	244	0	21	14	☑
Fluoride	mg/L	1.5	158	0	1.1	0.98	☑
Lead	mg/L	0.01	158	0	0.002	<0.001	☑
Manganese	mg/L	0.5	2687	1	0.59	0.013	☑
Monochloroacetic Acid	ug/L	150	244	0	13	<10	☑
Nickel	mg/L	0.02	158	0	0.012	<0.001	☑
Nitrate	mg/L	50	2687	0	1.1	0.63	☑
Nitrite	mg/L	3	2687	0	0.65	0.23	☑
Trichloroacetic Acid	ug/L	100	244	0	15	<10	☑
Trihalomethanes (Total)	ug/L	250	364	0	200	150	☑

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	Somerset Township	SEQ Water Supply (Brisbane and Ipswich
2-Methyl isoborneol	ng/L	-	<2	<2	<2	<2	<2	<2	<2	<2	2.6	<2	4.1	2.7
Aluminium	mg/L	0.2	0.013	0.029	0.018	0.053	0.021	0.031	0.021	0.024	0.026	0.014	0.042	0.043
Ammonia (Total, as N)	mg/L	0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.05
Chloride	mg/L	250	87	54	25	66	33	37	78	38	65	110	42	64
Colour (True)	PCU	15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8
Conductivity	uS/cm	-	560	430	220	420	430	300	530	310	430	560	280	450
Geosmin	ng/L	-	<2	3.2	<2	<2	<2	<2	<2	<2	<2	<2	2.1	<2
Iron	mg/L	0.3	0.004	0.006	0.006	0.008	0.004	0.017	0.006	0.008	0.009	0.008	0.032	0.012
Langelier Index	-	-	0.22	-0.58	-0.41	-0.25	-0.94	-0.73	0.36	-0.76	-0.36	0.26	-0.85	-0.18
pH	pH Unit	6.5 - 8.5	8.0	7.4	7.8	7.4	7.4	7.6	8.2	7.7	7.5	8.0	7.8	7.7
Silica	mg/L	80	26	10	26	4.1	11	3.3	23	2.5	6.1	18	2.1	5.9
Sodium	mg/L	180	51	48	14	39	67	31	51	32	36	58	28	40
Sulphate (as SO4)	mg/L	250	9.6	48	1.7	26	83	35	51	36	29	13	27	26
Temperature	deg C	-	24	24	23	25	22	24	24	23	24	23	25	24
Total Dissolved Solids	mg/L	600	360	270	140	270	280	190	340	200	270	360	180	290
Total Hardness	mg/L	200	140	100	72	110	50	66	140	66	120	130	59	120
Turbidity	NTU	5	<0.1	<0.1	0.11	0.11	<0.1	0.11	0.12	0.12	0.11	<0.1	0.2	0.19
Zinc	mg/L	3	0.004	<0.001	0.003	0.002	0.006	0.005	0.003	0.004	0.003	0.009	0.005	0.003
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. 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 Energy and Water Supply (DEWS)	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 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. The measurement of turbidity is a key test of water quality.
Nitrate (NO3)	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. 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 Energy and Water Supply (DEWS).
Total dissolved solids (TDS)	A measure of inorganic salts 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.

For more information visit
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