The Queensland Water Directorate

One voice for the Queensland urban water industry

Queensland's Urban Potable Water & Sewerage Benchmarking Report

Released December 2019

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Queensland Water Directorate

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1. Introduction

This is the ninth annual Urban Potable Water and Sewerage Benchmarking Report to be produced by the Queensland Water Directorate (***qldwater***) for Queensland. It contains a suite of indicators and benchmarking data for all 72 of Queensland's urban water/sewerage utilities. The data is presented in figures that provide comparative information to enable each service provider to compare its performance against that of similar sized service providers.

The report is divided into two areas: sewerage services and potable water supply, and looks at aspects of capacity and viability, customer service, condition of assets, management and performance.

Queensland (along with NSW) differs from other states and territories in Australia in that its drinking water and wastewater services are primarily the responsibility of local government. In Queensland, urban services are provided by 69 councils, one non-council entity (RTA Weipa), three bulk water suppliers (data not included here) and two council-owned Distribution Retail Entities (DREs), compared to other states and territories that typically have either a single authority or a number of regional statutory authorities.

During 2018/19 Queensland's council-owned service providers spent more than $2.15 billion operating the $40 billion worth of water and sewerage infrastructure under their control.

These water and wastewater services are provided to around 2 million water connections and 1.8 million sewerage connections in Queensland. They are required for public health and essential services, and generally must operate continuously without disruption.

Legislative changes in 2014 resulted in a change to the reporting requirements of service providers in Queensland. In 2014/15 service providers in the state were first required to report via the Key Performance Indicators Framework. This change underscored the importance of achieving good outcomes in compliance and delivering services to communities through rigorous benchmarking. This has brought Queensland in line with several other Australian jurisdictions, and also with the National Performance Framework whereby larger service providers have been required to report annual performance data for some time.

The Queensland Water Directorate strongly supports the use of performance reporting and benchmarking to assist service providers in the continuous improvement of the services they provide to their community. Performance reporting and benchmarking provide valuable comparative data. This data enables each service provider to critically examine its performance by investigating trends in its indicators and by comparing its performance against those of similar service providers, and particularly against high-performing service providers that are in a similar position and implementing the best-practices that are appropriate for their region. The diversity of the Queensland sector means that there is a broad variety of external factors influencing efficiency and effectiveness of service providers so comparisons with those with similar cost drivers will be most useful. The Queensland Government has publicly released the KPI data each year and is expected to shortly report data up to 2017/18 data via a web interface.

1.2. External factors potentially influencing performance

There are a wide range of 'external' factors which can influence a service provider's performance. These factors include things such as:

- Climate – rainfall patterns, evaporation, temperature
- Geography – geology i.e. soil reactivity (shrink-swell), topography (i.e. mountains, flood plain)
- Size – population, number of connections, area served
- Location – e.g. SEQ vs. Western Qld, dense urban vs. rural urban
- Services provided – water treatment vs. treated water imported from another supplier
- Water supply – river vs. dam vs. bore water may require different treatment, distance to supply
- Asset age – old assets may require more maintenance/repairs and be less efficient
- Regulatory requirements – sewage treatment levels

It is important to take these factors into account when comparing performance with other service providers.

One way for service providers to limit the effects of these external factors is to examine trends in their own performance indicators over time. It must be remembered that there may be also changes in the external factors over time as well (e.g. wet vs. dry years).

1.3. Service provider size as a factor in assessing statewide 'benchmark' performance

It is important to note up front that the figures for smaller service providers may be skewed towards relatively higher values for indicators that standardise data by 'per property', 'per connection' or 'per 100 km of mains'. This is due to these smaller service providers having very low populations and relatively short lengths of mains so that even small figures can be magnified when compared with larger organisations. This means that these indicators can result in small organisations comparing poorly with larger ones despite having similar performance profiles. In such cases, benchmarking is only useful against service providers of a similar size.

Throughout this report figures show ranked values of indicators for each service provider that reported in 2018/19 in five groups based on the number of (water) connected properties served. Small SP with less than 1,000 connections (light blue), indigenous SP (dark blue), medium SP with between 1,000 and 9,999 connections (light brown), large SP with between 10,000 and 50,000 connections (dark brown) and extra-large SP with more than 50,000 connections (red).

2. Sewerage Services

2.1. Capacity and viability

The total reported capital expenditure on sewerage infrastructure in Queensland was $562,415,200 for 2018/19. The statewide median capital expenditure was $249 per property. In addition, the total reported operating costs to collect and treat sewage from across the State was $627,205,200 at a median cost of $389 per property.

Capital expenditure

Capital expenditure will vary markedly from year-to-year, particularly when expressed per property for service providers with a small number of sewerage assets. The indicator provides a snapshot of investment across the industry (Figure 1). Review of Figure 1 shows that some service providers have clearly expended significant capital during the 2018/19 period. Most notable is the Wujal Wujal Aboriginal Shire Council, which reportedly spent in excess of $17,000 per property. This capital expenditure looks relatively large on account of the small number of connections within the community.

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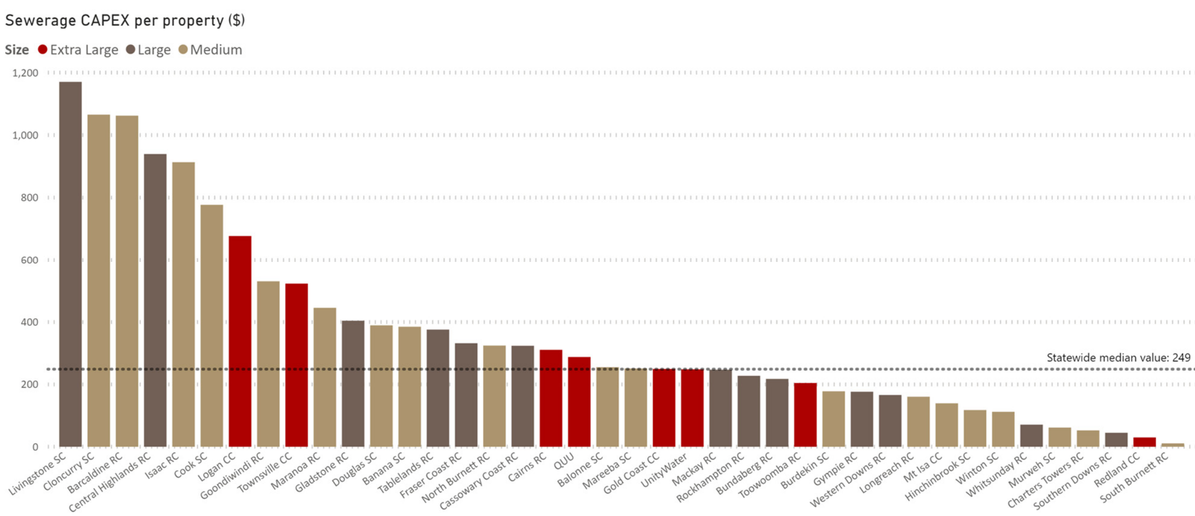

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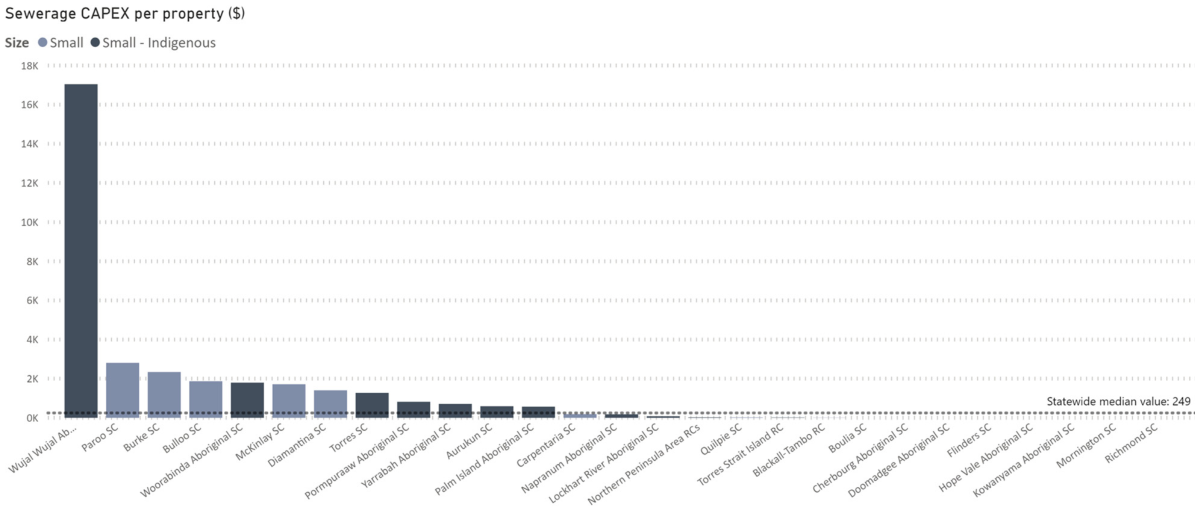


Figure 1: Sewerage capital expenditure per property ($) for (a) service providers with > 1,000 connections and (b) service providers with < 1,000 connections and indigenous councils. The statewide median value for sewerage capital expenditure for 2018/19 was $249 per property. Each bar represents one SP.

Operating costs

The 'sewerage operating cost per property' (Figure 2) is sometimes used an indicator of the operational efficiency of a service provider. The components of operating cost (operation, maintenance and administration) are:

- Charges for bulk treatment/transfer of sewerage
- Salaries and wages
- Overheads on salaries and wages
- Materials/chemicals/energy
- Contracts
- Accommodation
- All other operating costs that would normally be reported
- Items expensed from work in progress (capitalised expense items) and pensioner remission expenses
- Competitive neutrality adjustments, which may include land tax, debits tax, stamp duties and council rates

Topography will also affect operating costs through the amount of pumping needed to move the sewage to the treatment plant. With higher levels of sewage pumping comes an associated increase in asset maintenance and energy costs.

Examination of the distribution of service providers in Figure 2 shows that the rankings are not strongly correlated with the size of the service provider. This suggests that operating costs for sewerage services are strongly influenced by factors that are not directly related to the number of connections.

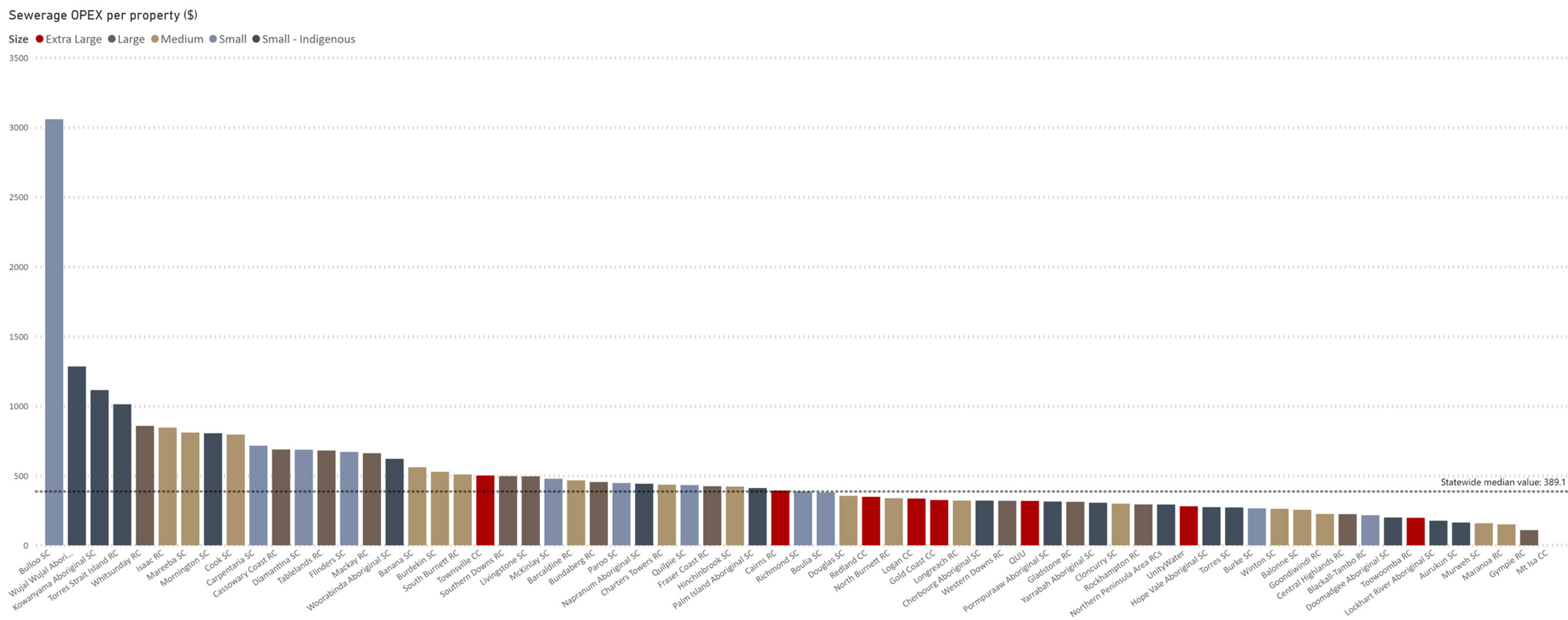


Figure 2: Sewerage operating costs per property ($). The statewide median value for sewerage operating costs per property for 2018/19 was $389 per property. Each bar represents one SP.

Cost drivers for sewerage services

The type of treatment as well as the level of treatment (related to the discharge/ reuse requirements) of sewage will affect the operating costs. With higher levels of sewage treatment come associated increases in other costs, particularly energy and human resources.

Service providers with a number of separate sewerage systems, larger areas of low-density service (i.e. low numbers of properties serviced per km of main) and those with higher numbers of, and smaller, sewage treatment plants will generally need more employees to effectively manage their systems and thus have higher operational costs. Management of biosolids is another costly expense which is greater for large service providers, particularly if they are at a large distance from reuse or disposal sites.

The maintenance costs of sewerage infrastructure are related to several factors, such as the age and condition of the assets and the soil reactivity (shrink-swell of soils damaging pipes).

Typical annual residential bill

The 'typical annual residential bill: sewerage' is the dollar amount of the typical residential sewerage bill for the financial year, including special levies (Figure 3). If the bill is cost-reflective and a service providers' operations are run effectively and efficiently, the typical residential bill should be minimised and indicate the service provider is providing value for the community. However, if bills are lower than costs then a service provider may not be financially sustainable. The aim for a service provider should be to provide agreed levels of service at the lowest, but importantly sustainable, residential bill considering the costs of operations, capital and appropriate financial returns.

This indicator is currently only legislatively required to be reported as separate water and sewerage components by service providers with greater than 10,000 connections. Smaller utilities report the value for combined operations. The median typical annual residential bill for sewerage services by service providers with greater than 10,000 connections was $724, and $623 for all reporting entities.

The median value for the typical annual residential bill for water and sewerage combined is $1,439 and is reported by all service providers with the exception of Barcoo, Croydon, Etheridge and Mapoon Aboriginal Councils because they do not provide sewerage services.

Examination of the chart for the typical annual residential bill: water and sewerage (Figure 4) shows an obvious trend for smaller service provider's bills to be lower than large providers, which is opposite to the trend of decreasing cost with size demonstrated for large utilities nationally., in that the small service providers (<1,000 connections) are predominantly distributed to ranks below the median values, and are dominated by those service providers that are able to source water from the GAB that is not treated. In contrast, the medium sized service providers (1,000 to 9,999 connections) are clustered to the higher end of the rankings.

This in part reflects the lower costs for some small service providers that do not have sewage treatment, and which may have simple or no water treatment because of potable bore water supplies. Note that most aboriginal councils in Queensland do not directly charge residents for water or sewerage services and often report $0 for this indicator.

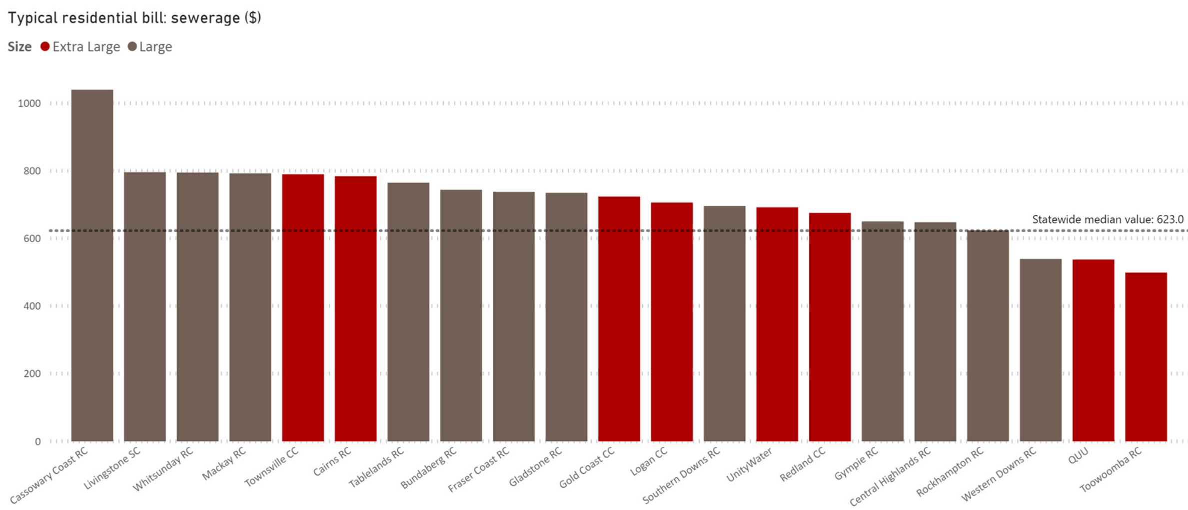


Figure 3: Typical annual residential bill: sewerage ($). The statewide median value for the typical residential bill: sewerage for 2018/19 for the 67 SPs that reported in 2018/19 was $623 per property. Each bar represents one SP.

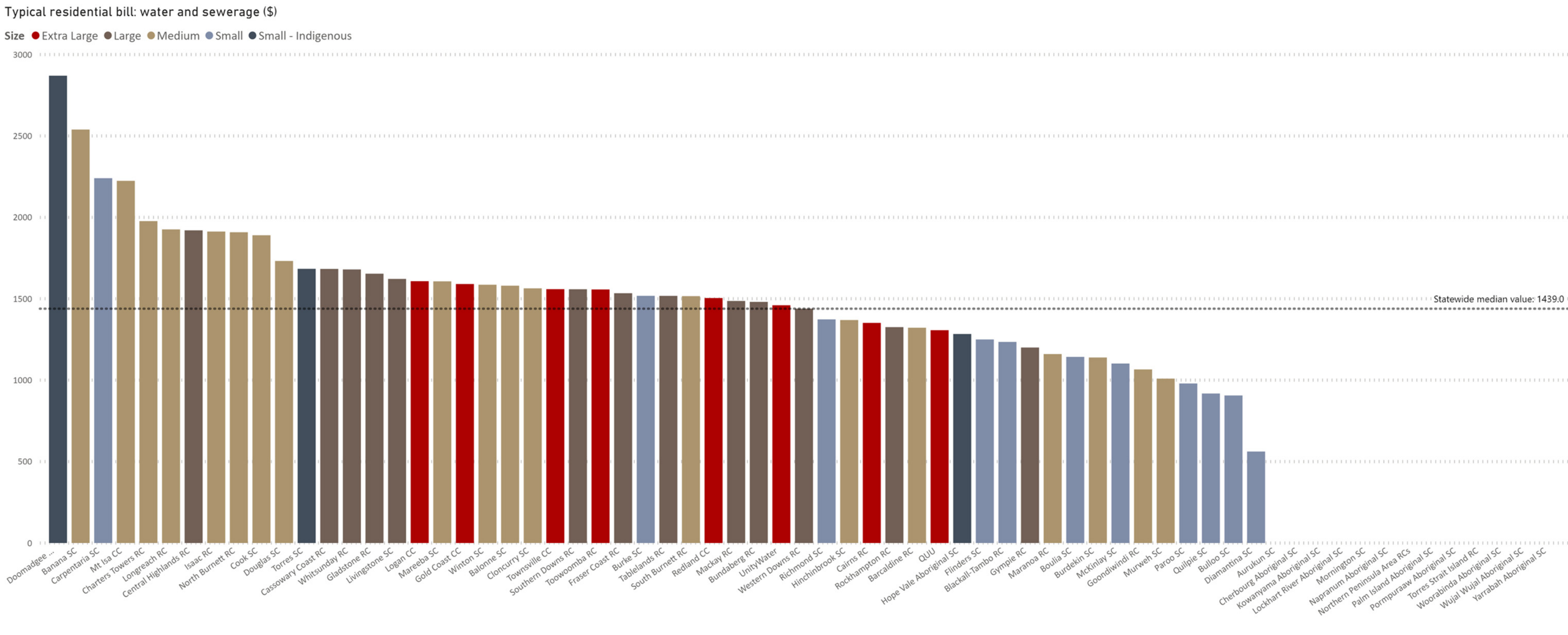


Figure 4: Typical annual residential bill: water and sewerage ($). The statewide median value for typical annual bill for water and sewerage for 2018/19 was $1,439. Each bar represents one SP.

Economic real rate of return

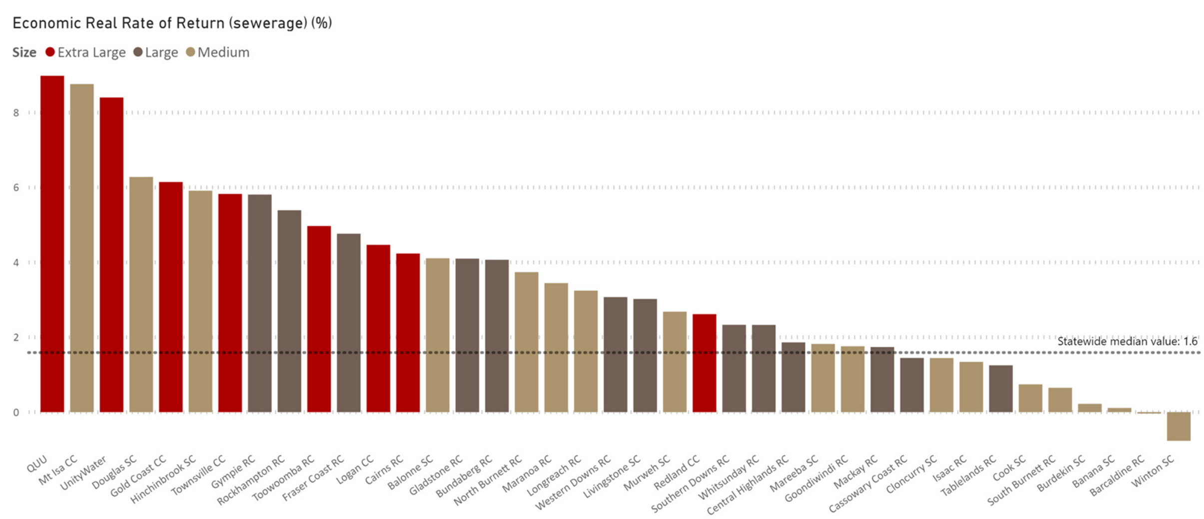
In the case of council-owned service providers, the financial performance of many service providers is intricately linked with that of the owner council. This makes determining the financial performance of the sewerage operations as an individual business unit hard to assess particularly for small service providers.

In addition, an important distinction must be made between the category of (usually large) councils that are financially sustainable and can provide dividends to benefit their communities, and the small and often more remote councils. In the latter, smaller populations and small rates bases can mean that funding assistance and subsidies from other council income is necessary to maintain services and, in some cases, even operating costs may not be recovered.

One comparator of financial performance is the Economic Real Rate of Return (ERRR). The ERRR (sewerage) is the revenue from sewerage business operations, less operating expenses for the sewerage business, divided by written down replacement cost of operational assets. An appropriate value for ERRR is difficult to determine for service providers but should be at least positive, with a margin to allow for return on capital (NWC and WSAA, 2010). OTTER (2011) suggested that an ERRR of around 7% was required for full cost recovery in the pre-amalgamation Tasmanian urban water industry. The Productivity Commission questioned whether the NWC and the NSW Office of Water definition of full cost recovery as an ERRR "greater than or equal to zero" was sufficient (see PC, 2011, p. 386).

ERRR data is now only specifically required under the Queensland KPI framework from service providers with greater than 10,000 water connections, however, it can be calculated from other indicators requested from all service providers. The data provided here (Figure 5) are the calculated values for all service providers to allow for consistent comparison. The statewide median value for ERRR (sewerage) for all service providers that provided data was 1.6%.

(a)



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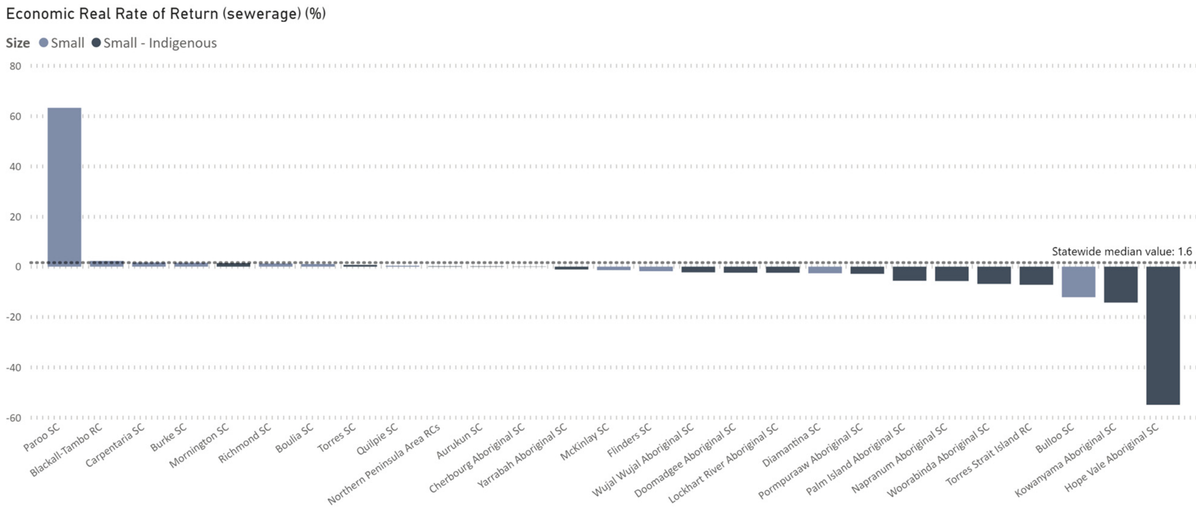


Figure 5: Economic Real Rate of Return (sewerage) (%) for (a) Service providers with > 1,000 connections and (b) Service providers with < 1,000 connections and indigenous councils. The statewide median value for Economic Real Rate of Return (sewerage) 2018/19 was 1.6 %. Each bar represents one SP.

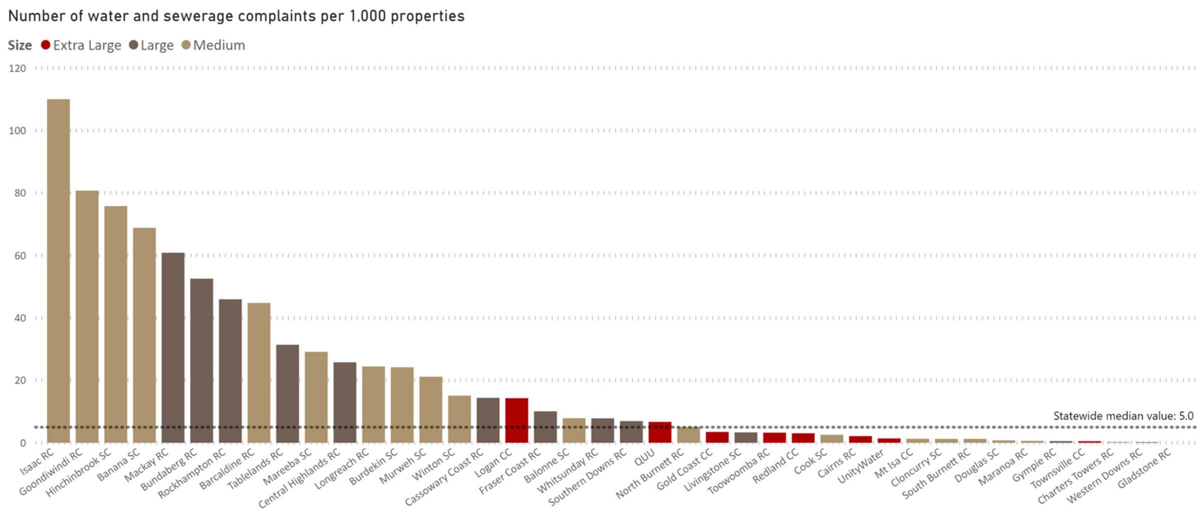
Examination of the ERRR (sewerage) chart in Figure 5 (a) shows that the large and extra-large service providers are almost all greater than zero, and that all but one of the medium sized service providers have calculated ERRR that are greater than zero. Only three service providers satisfy the OTTER (2011) definition for "full cost recovery". In Figure 5 (b) aside from the likely spurious data for Paroo Shire Council, the very low or negative ERRR values for small and indigenous service providers reflect the difficulty in recovering costs from small councils with low rates base and the fact that most Aboriginal councils do not collect water or sewerage fees from their communities.

2.2. Customer service

Water and sewerage complaints

Water and sewerage complaints are no longer required to be reported separately (or broken down into sub-categories like service, billing, etc.). A single figure for all water and sewerage complaints (combined) is reported by all service providers and shown below (Figure 6). Unfortunately, the interpretation of what comprises a 'complaint' varies markedly among utilities and comparisons among service providers are therefore largely inappropriate. During 2018/19 a total of 18,477 water and sewerage related complaints were reported across the State. The statewide median number of water and sewerage complaints per 1,000 properties was 5.0.

(a)



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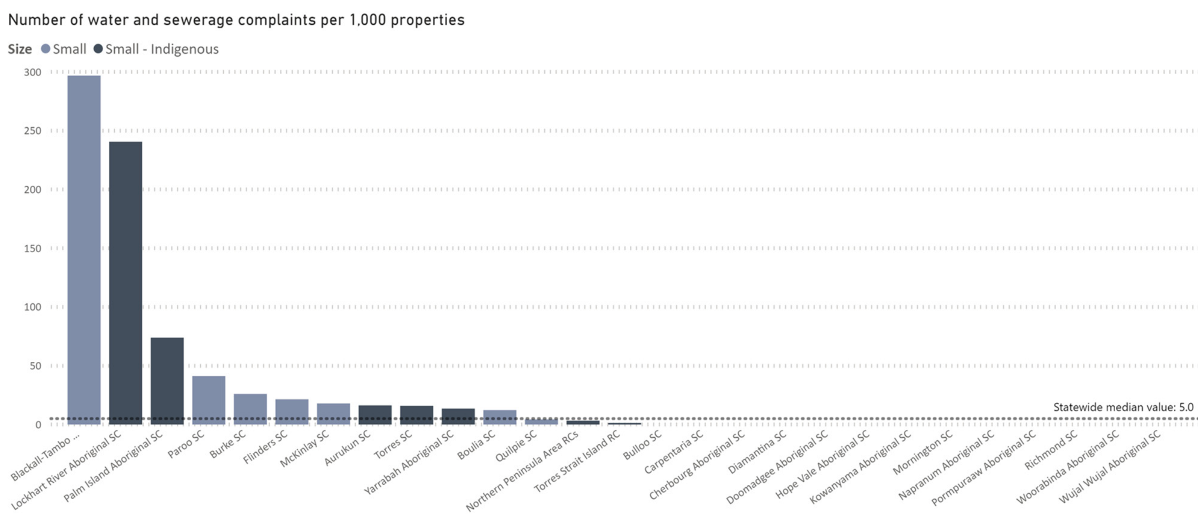


Figure 6: Number of water and sewerage complaints per 1,000 properties for (a) Service providers with > 1,000 connections and (b) Service providers with < 1,000 connections and indigenous councils. The statewide median value for the number of water and sewerage complaints per 1,000 properties was 5 per property. Each bar represents one SP.

Response time to sewerage incidents

Reporting on specific response times for sewerage incidents has limited meaning. SPs often report that there is no ‘ideal’ response time as it varies depending on the type of incident (e.g. emergencies should be treated faster than minor issues) and the distance to the area of concern. Instead it is more appropriate to report on the percentage of customer service standards achieved within target times. This means that the results reported are against the specific Customer Service Standards (CSS) to which service providers have agreed with their customers. As a result, CSS are not the same for every service provider and this fact should be taken into account when comparing data for different service providers. (Figure 7). The statewide median for the percent of CSS response time targets met for sewerage incidents was 100%.

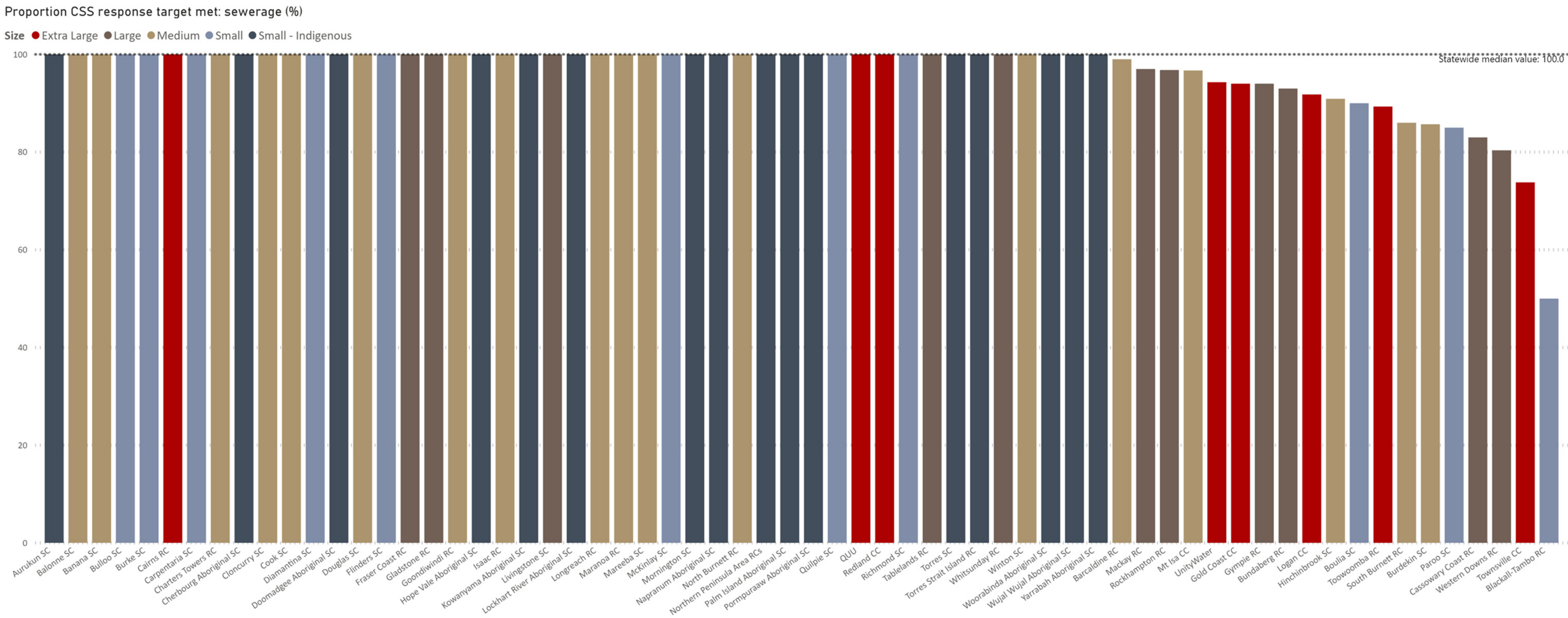


Figure 7: Proportion CSS response time targets met: sewerage (%). The statewide median value for proportion CSS response time targets met: sewerage for 2018/19 was 100%. Each bar represents one SP.

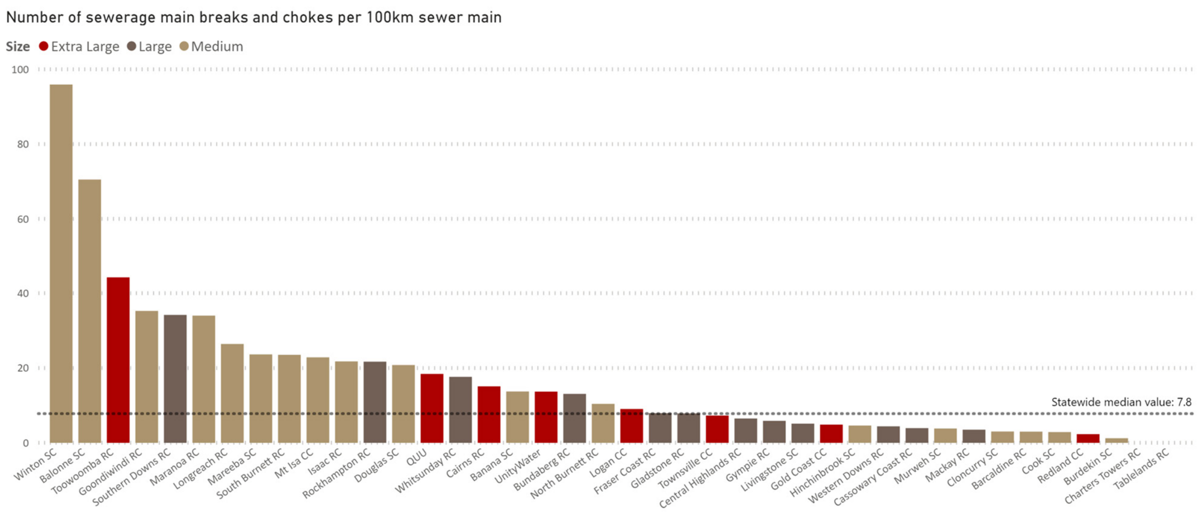
2.3. Condition of assets

Sewerage main breaks and chokes

The statewide median for the number of sewer main breaks and chokes reported per 100 km of sewer mains during 2018/19 was 7.8. This indicator can provide a rough indication of the condition and age of sewerage infrastructure although data may include breaks caused by third parties (e.g. accidental damage from excavation) as well as other anomalies like earth quakes and mining activities (underground blasting) and the impacts of extended dry and wet periods in areas with reactive soils.

The data as presented in Figure 8 must be viewed with caution as those service providers with small populations and small networks may be skewed towards the higher end of the rankings and may not be a robust reflection of the age or condition of the sewerage network.

(a)



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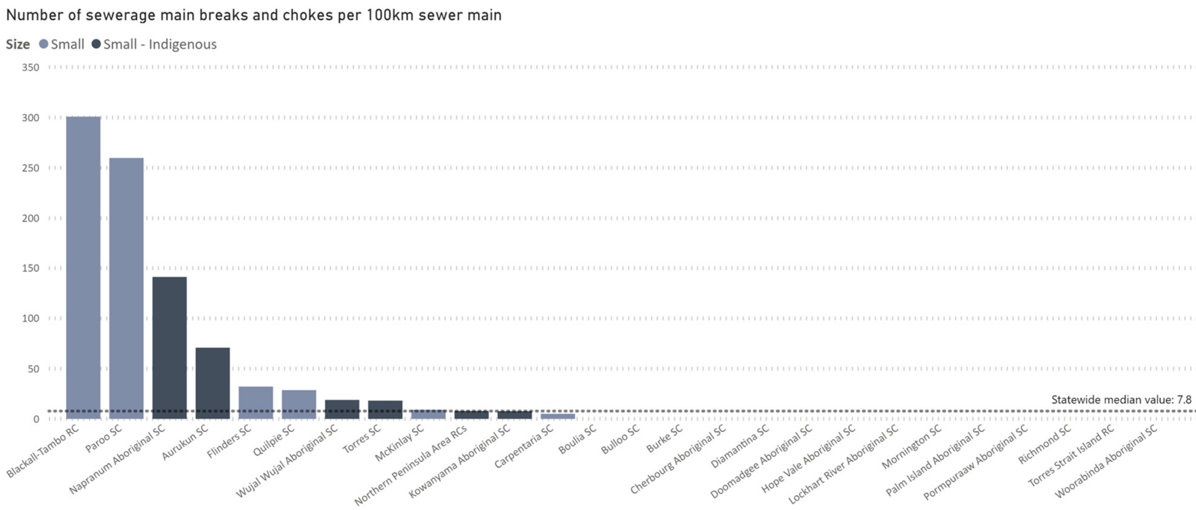


Figure 8: Number of sewerage main breaks and chokes per 100 km sewer main for (a) Service providers with > 1,000 connections and (b) Service providers with < 1,000 connections and indigenous councils. The statewide median value for the sewerage main breaks and chokes per 100 km sewer main was 7.8 per 100 km sewer main. Each bar represents one SP.

3. Potable Water Supply

3.1. Capacity and viability

A total of 643,224 ML of water was sourced across the state in 2018/19 from all sources, including marine (desalination), surface water, groundwater and recycled (sewerage/stormwater) sources. Of this, 577,226 ML of potable water was produced with 356,525 ML supplied to residential customers, 135,643 ML to non-residential customers and 72,637 as non-revenue water. An additional 5,878 ML of raw-partially treated water was also supplied to customers (2,550 ML to residential and 3,328 ML to non-residential). A total of 44,753 ML of recycled water was supplied to customers in 2018/19 and is generally used for irrigation purposes (e.g. golf courses, sporting fields and crops).

The reported total capital expenditure on water supply was $361,738,700 for 2018/19. The statewide median for capital expenditure was $316 per property. In addition, the reported total operating costs to supply water from across the state was $1,526,870,000 at a median cost of $632 per property for the State.

Capital expenditure

Capital expenditure varies markedly from year-to-year, particularly for service providers with a smaller number of water assets, but still provides a snapshot of investment across the industry (Figure 9).

Review of Figure 9 shows that the capital expenditure by service providers on a per property comparison basis is dominated by the service providers with less than 10,000 connections. This may be an artefact of the relatively small number of connections within these communities compared to the cost of a typical water infrastructure capital investment.

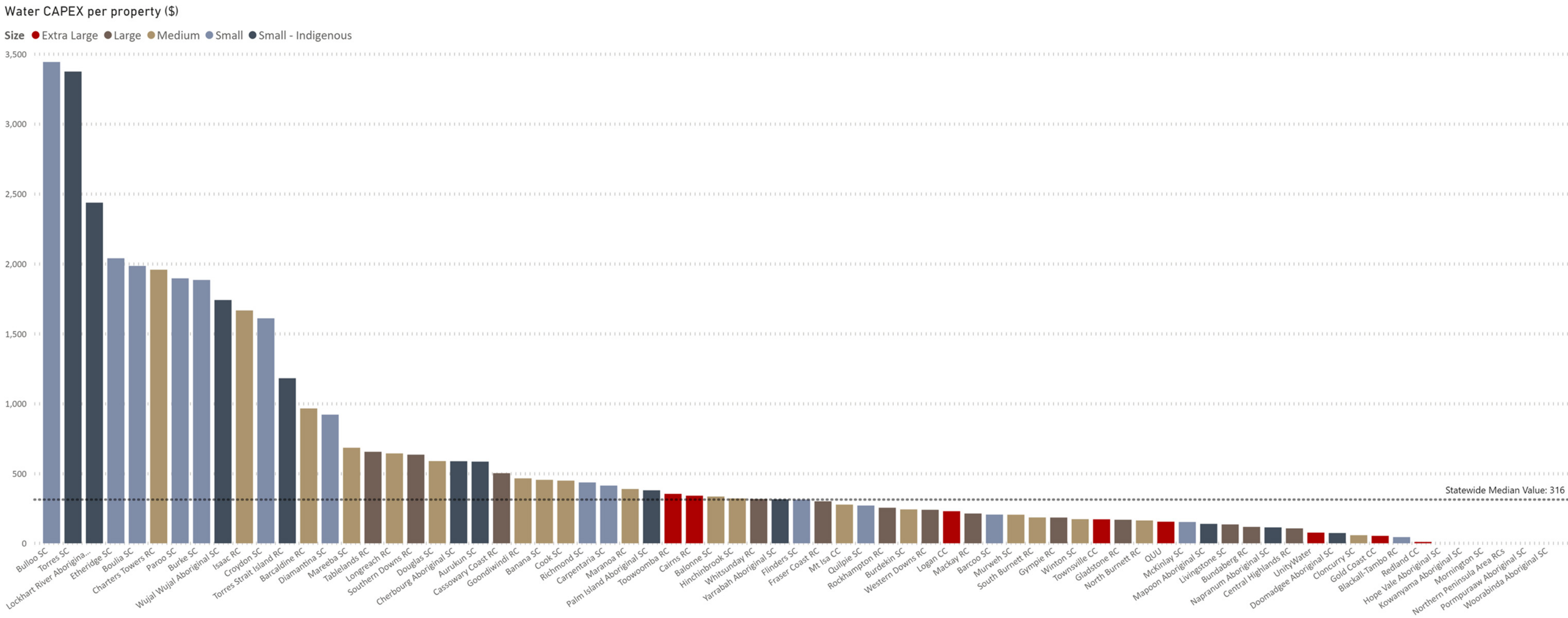


Figure 9: Water supply capital expenditure per property ($).The statewide median value for water supply capital expenditure per property for 2018/19 was $316. Each bar represents one SP.

Operating costs

Service providers with cost reflective pricing and effective and efficient systems will have lower operating costs and thus provide better value for money to their customers. The components of operating cost (operation, maintenance and administration) are:

- Water resource access charge or resource rent tax
- Purchases of raw, treated or recycled water
- Salaries and wages
- Overheads on salaries and wages
- Materials/chemicals/energy
- Contracts
- Accommodation
- All other operating costs that would normally be reported
- Items expensed from work in progress (capitalised expense items) and pensioner remission expenses
- Competitive neutrality adjustments, which may include land tax, debits tax, stamp duties and council rates

Water operating costs per property ($) are shown in Figure 10. It shows that, similar to CAPEX per property, service providers with higher OPEX per property are dominated by the councils with <10,000 connections. For smaller councils, which are also generally the more remote councils, many of the cost components listed above are higher than for their larger, less remote counterparts.

Cost drivers for water supply

External factors beyond the control of individual organisations dramatically affect the cost of providing water services. For example, service providers that maintain major storage dams for their water supply may have larger capital expenditure and operating costs than other service providers.

The amount and type of treatment needed for the water sourced will also affect operating costs. However, larger water treatment plants may have lower costs than smaller plants, through economies of scale. Service providers with a number of separate water supply systems, larger areas of low-density service (i.e. low numbers of properties serviced per km of main) and those with higher numbers of smaller water treatment plants will generally need more employees and other resources to effectively manage their systems and thus have higher costs.

The topography and location of the water supply will also affect operating costs through the amount of pumping needed to move the water to the treatment plant and then on to the customer and will have a relatively greater impact on small providers. High numbers of connections within urban areas provide economies (through density) which will help to reduce this cost, relative to service providers with widely spaced connections.

Maintenance costs of water supply pipe infrastructure is related to several factors, such as the age, type and condition of the assets, the soil reactivity (shrink-swell impacts on buried pipes), corrosive water, water pressures and the density of connected properties.

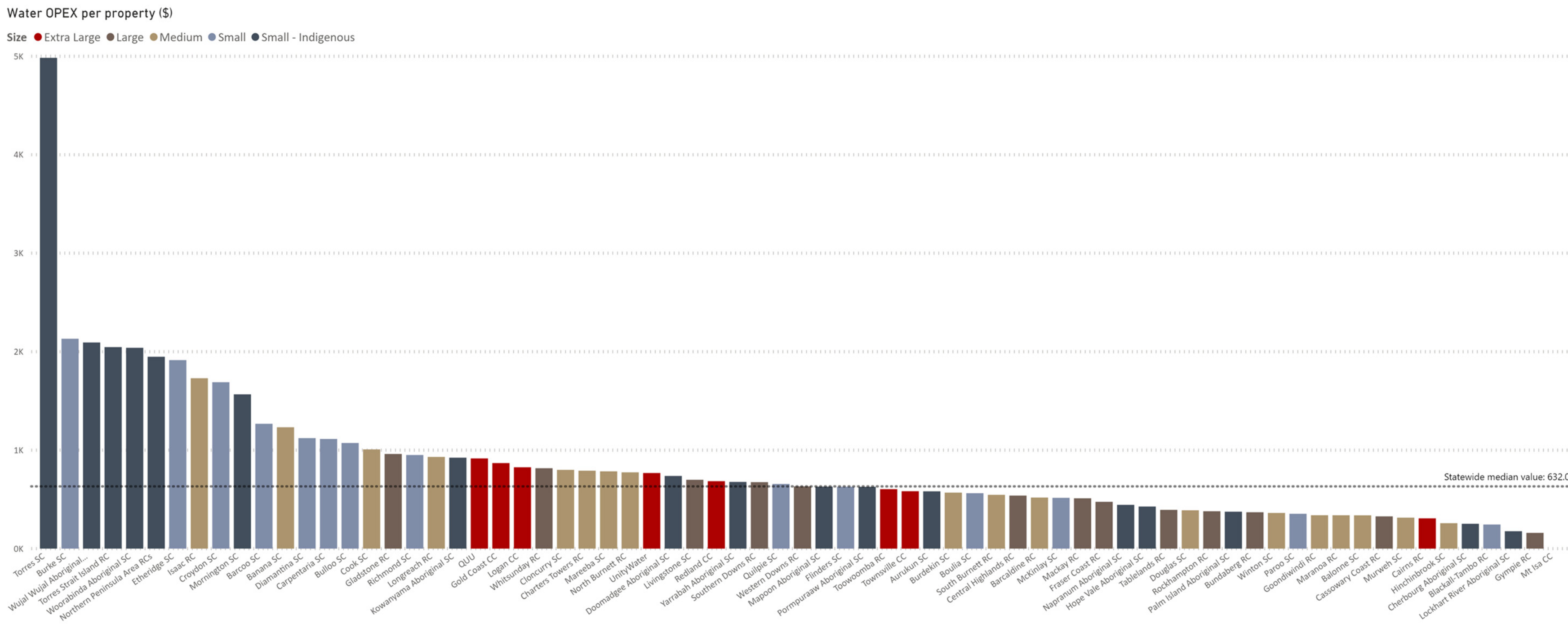


Figure 10: Water operating costs per property ($). The statewide median value for water operting costs per property for 2018/19 was $632. Each bar represents one SP.

Typical annual residential bill

The 'typical annual residential bill – water' is the dollar amount of the typical residential water bill for the financial year, including special levies. If the bill is cost-reflective and a service providers' operations are run as effectively and efficiently as possible, then the typical residential bill should be minimised and the service provider would be providing value for the community. However, if bills are lower than costs then a service provider may not be financially sustainable. The aim for a service provider should be to provide agreed levels of service at the lowest sustainable bill considering all costs and return on capital. Comparison of such indicators and consideration of efficiency is important as there may be incentives to either charge too little (e.g. to impress customers) or to charge too much (e.g. to increase returns).

This indicator is only required to be reported as separate water and sewerage components by service providers with greater than 10,000 connections (Figure 11) though smaller service providers are still encouraged to report both values. The median typical residential bill for water supply by service providers with greater than 10,000 connections was $796, and $737 for all reporting entities. The typical annual residential bill (water and sewerage combined) is reported by all service providers and shown in Figure 4 in the sewerage section above.

Note that most indigenous councils in Queensland do not specifically charge residents water or sewerage fees and often report $0 for this indicator.

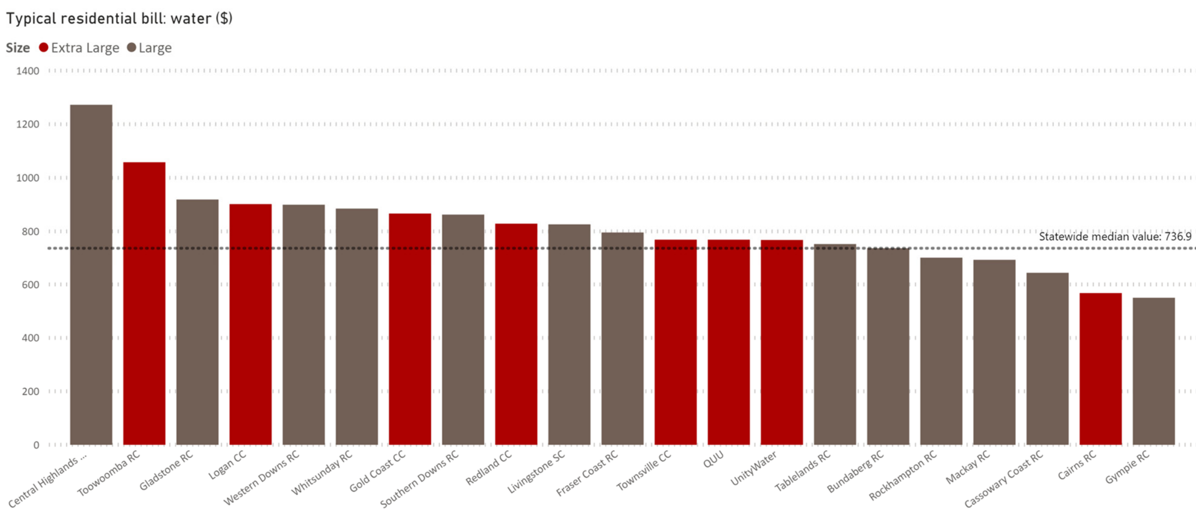


Figure 11: Typical annual residential bill: water ($).The statewide median value for the typical residential bill: water for 2018/19 for the 71 SPs that reported in 2018/19 was $737 per property. Each bar represents one SP.

Economic real rate of return

As for sewerage services, in the case of council-owned service providers the financial performance of most service providers is intricately linked with their owner councils, making it difficult to assess the financial performance of the water supply operations specifically.

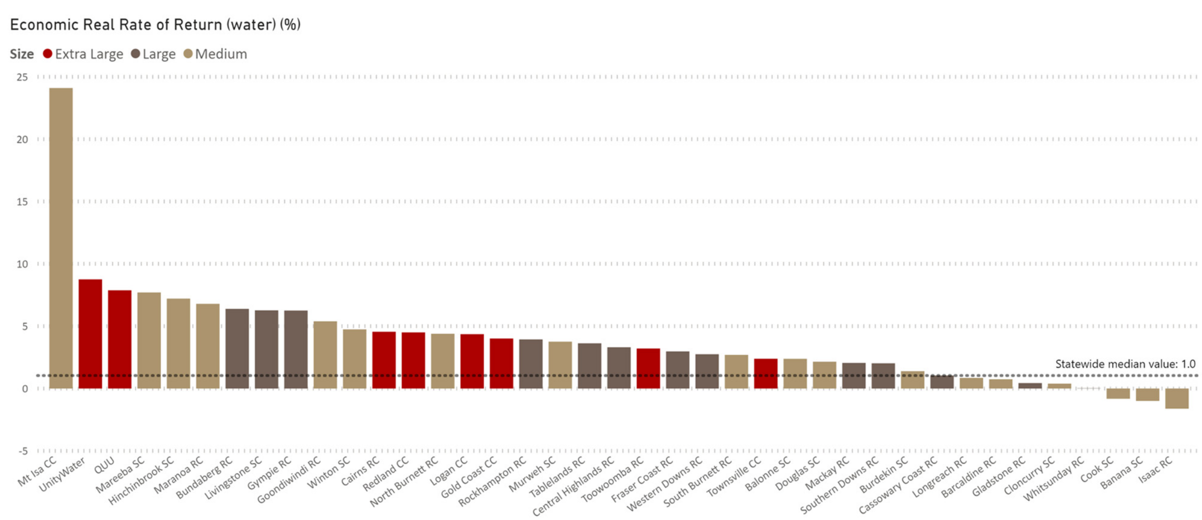
In addition, an important distinction must be made between the category of (usually larger) councils that can be categorised as financially sustainable and can generate dividends (return on capital) to support their communities, and the smaller and often more remote councils. In the latter, smaller populations (and thus rate bases) can mean that capital investment in water infrastructure is difficult and relies on funding assistance and subsidies from other sources of income. In some cases, even operating costs can be difficult to meet.

One comparator of financial performance is the Economic Real Rate of Return (ERRR). The ERRR: water is the revenue from water business operations, less operating expenses for the water business, divided by written down replacement cost of operational water assets. An appropriate value for ERRR is difficult to determine for service providers but should be at least positive with a margin to allow for return on capital (NWC and WSAA, 2010). OTTER (2011) suggested that an ERRR of around 7% was required for full cost recovery in the Tasmanian urban water industry while the Productivity Commission questioned the appropriateness of NWC and NSW Office of Water definitions of full cost recovery as an ERRR "greater than or equal to zero" (see PC, 2011, p. 386).

ERRR data is now only specifically requested from service providers with greater than 10,000 water connections, however, it can be calculated from other indicators requested from all service providers. The data provided in Figure 12 are the calculated values. The statewide median value for ERRR: water for all service providers that provided data was 1.0%.

Examination of Figure 12 shows that by and large the service providers with greater than 10,000 connections (medium, large and extra-large categories as shown in Figure 12 (a)) have positive values for ERRR: water, with a handful of these service providers exceeding the 7% OTTER target for full cost recovery. In contrast, the small and indigenous service providers (Figure 12 (b)) are dominantly negative, suggesting that these providers have difficulty in recovering the cost of the services from their customers.

(a)



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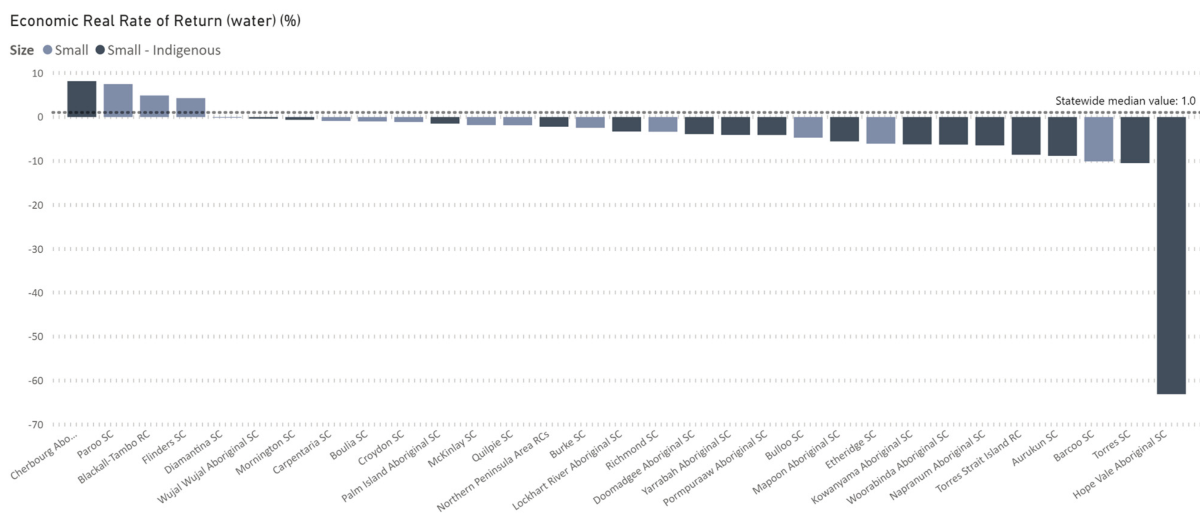


Figure 12: Economic Real Rate of Return (ERRR): water for (a) Service providers with > 1,000 connections and (b) Service providers with < 1,000 connections and indigenous councils. The statewide median value for Economic Real Rate of Return (ERRR): water was 1.0 %. Each bar represents one SP.

3.2. Customer service

Water complaints

As discussed above, water and sewerage complaints are no longer required to be reported separately (or broken down into sub-categories like service, billing, etc.). Water and sewerage complaints (combined) is reported by service providers and is discussed within the sewerage services section of this report (see Figure 6).

Response time to water incidents

Reporting on specific response times for water incidents has no real meaning as there is no 'ideal' response time as it varies depending on the type of incident (e.g. emergencies should be treated faster than minor issues) and the distance to the area of concern. Instead it is more appropriate to report on the percentage of customer service standards achieved within target times. This means that the results reported are against the specific Customer Service Standards (CSS) that service providers have agreed to with their customers. The results reported are independent of the specific response time taken and the associated issues discussed above and allows the results to be compared among service providers. The statewide median for the proportion of CSS response time targets met for water incidents was 100% (Figure 13).

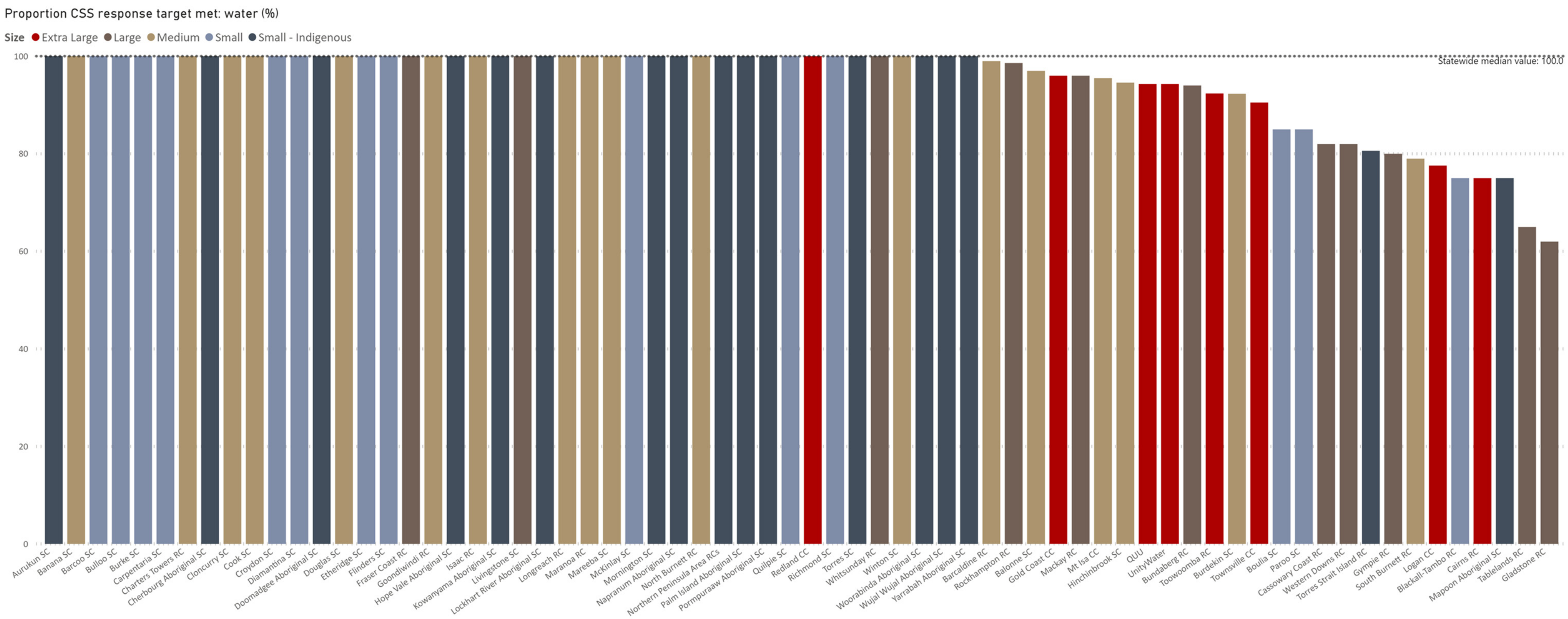


Figure 13: Proportion CSS response time targets met: water (%).The statewide median value for proportion CSS response time targets met: water for 2018/19 was 100%. Each bar represents one SP.

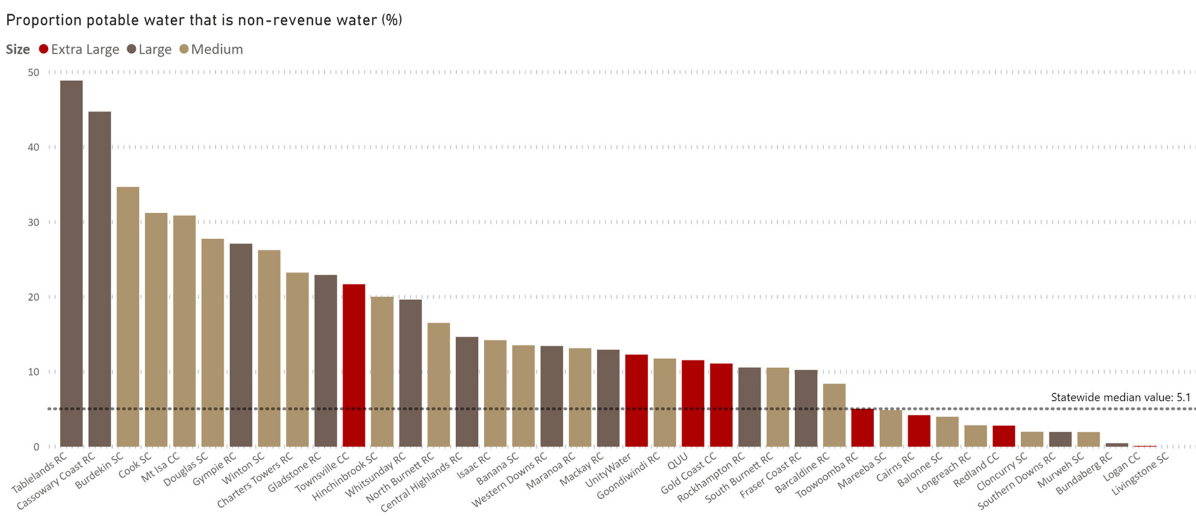
3.3. Condition of water assets

Non-revenue water

Non-revenue water is the amount of potable water produced for which revenue is not received. It is made up of unbilled authorised consumption (e.g. network flushing, firefighting), apparent losses (e.g. theft, meter errors), and real losses (e.g. leaks, bursts and overflows). Some non-revenue water is necessary in potable water production and network management including maintaining public safety. For instance some service providers have advised of excessive non-revenue water due to a requirement to flush their system extensively this year. For some service providers, like potable water losses, this represents an important additional cost to be managed. The statewide median value for the proportion of potable water produced that is non-revenue is 5.9% (Figure 14). Non-revenue water formed 12% of the total volume of water sourced during year.

Figure 14 shows that service providers with a low proportion of potable water that is non-revenue are dominated by the smaller and indigenous service providers. The reason for this is not known, but it is possibly related to the relatively smaller size of the water networks and lower water charges which may reduce occasions for unbilled authorised consumption and losses.

(a)



(b)

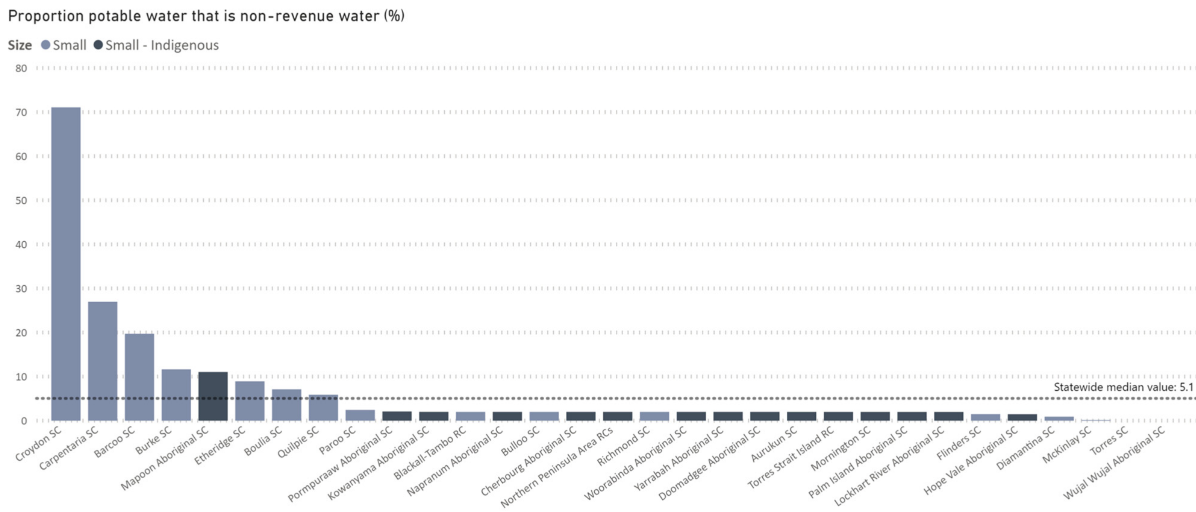
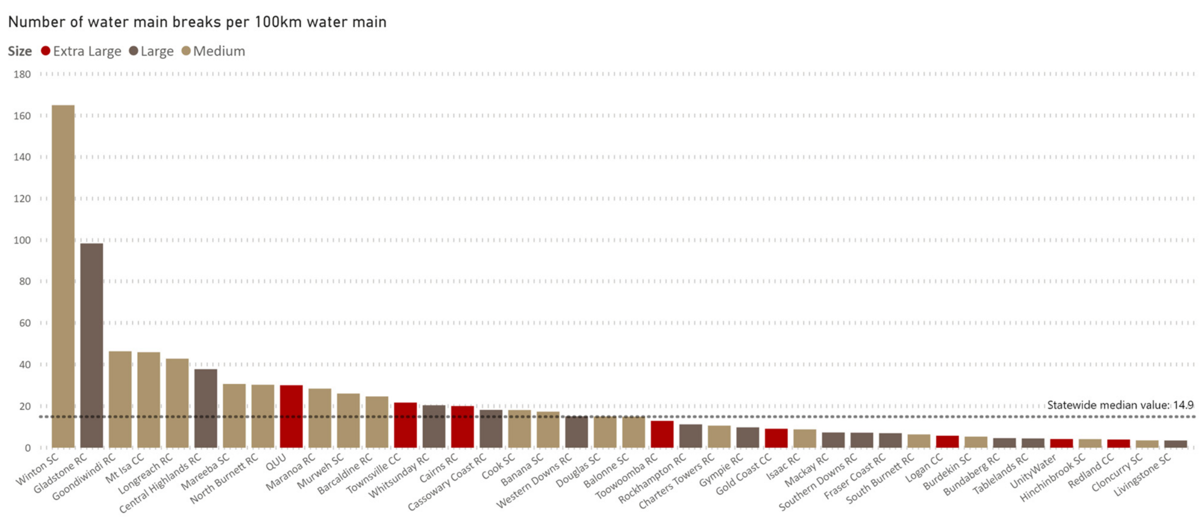


Figure 14: Proporton of potable water that is non-revenue (%) for (a) Service providers with > 1,000 connections and (b) Service providers with < 1,000 connections and indigenous councils. The statewide median value proporton of potable water that is non-revenue was 5.1 %. Each bar represents one SP.

Water main breaks

The statewide median for the number of water main breaks that were recorded per 100 km of main during 2018/19 was 14.9 (Figure 15). This indicator can provide a rough surrogate for the condition and age of water main infrastructure although data may include breaks caused by third parties (e.g. accidental damage during excavation) as well as other anomalies like earth quakes and mining activities (underground blasting).

(a)



(b)

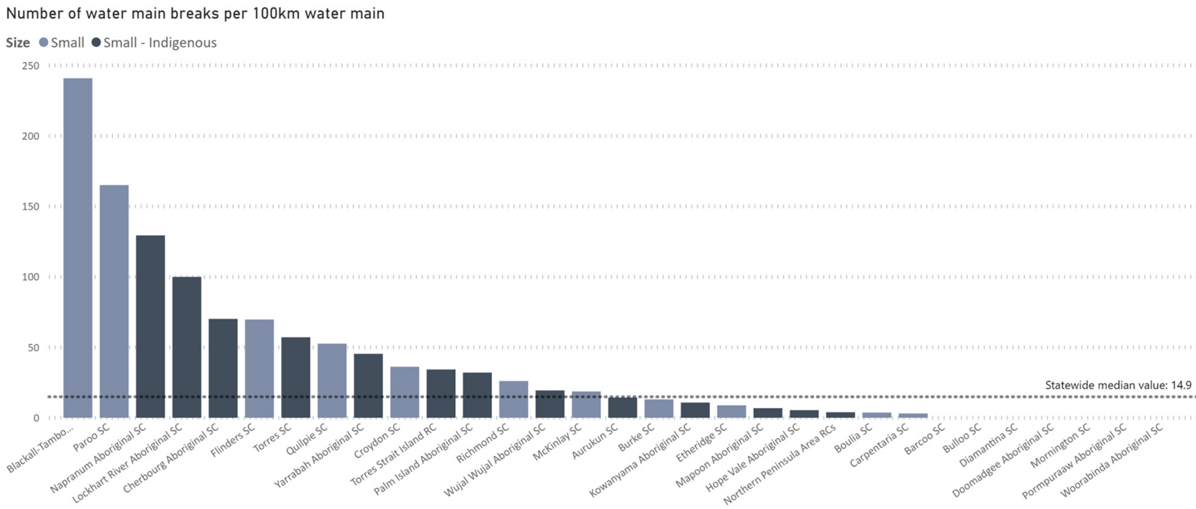


Figure 15: Number of water main breaks per 100 km water main for (a) Service providers with > 1,000 connections and (b) Service providers with < 1,000 connections and indigenous councils. The statewide median value for the water main breaks per 100 km water main was 14.9 per 100 km water main. Each bar represents one SP.

Real water losses

Real water losses are only required to be reported by service providers with greater than 10,000 connections. The statewide median for the amount of reported real water losses for these service providers for 2018/19 was 78.6 litres per service connection per day (Figure 16). This equates to almost 5,000 ML of potable water lost each year by these 20 service providers.

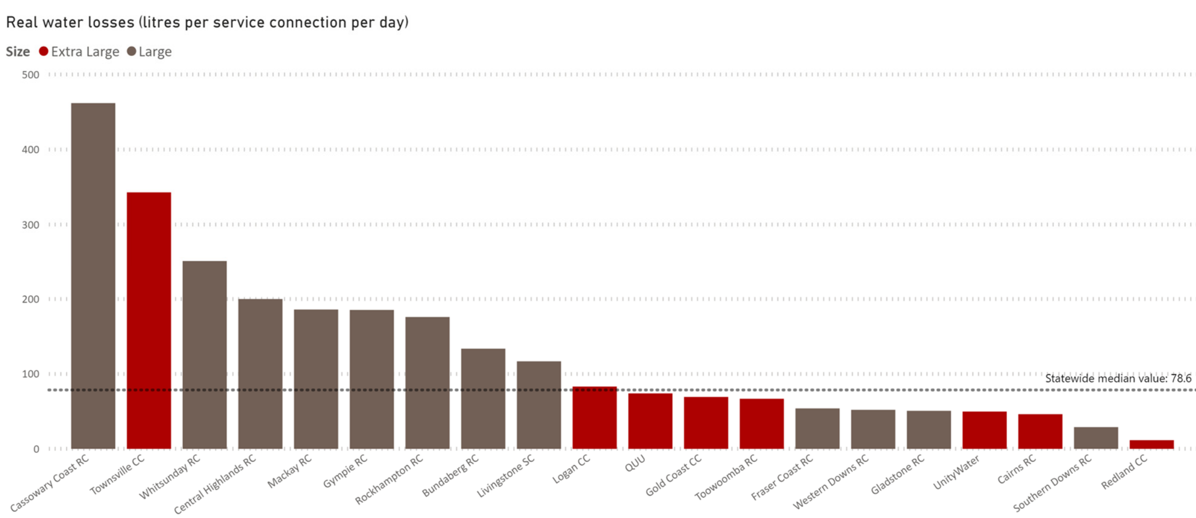


Figure 16: Real water losses (litres per service connection per day). The statewide median value for the real water losses for 2018/19 for the 20 SPs that reported in 2018/19 was 78.6 litres per service connection per day. Each bar represents one SP.

Water consumption

Per capita potable water consumption figures are commonly used by government and the media but are not required to be reported by any service providers. Residential potable water consumption may however be estimated from other reported indicators. In particular, the potable water supplied per connection per annum (reported by all but indigenous service providers), can be used as a proxy for per capita consumption as shown in Figure 17.

The median of reported values for average potable supply per property for the state was 555 kL in 2018/19, which continued to be similar to previous years (refer Table 1).

Table 1: Annual potable water supplied per connection per year since 2012/13.

Year	Annual potable water supplied per connection per year
2018-2019	555 kL
2017-2018	585 kL
2016-2017	515 kL
2015-2016	502 kL
2014-2015	519 kL
2013-2014	474 kL
2012-2013	509 kL

The potable water supplied per connection per annum, in kL per annum when divided by 365 provides a value for potable water supplied per connection per day. When this number is divided by an average number of persons per household, it yields an estimate of per capita daily consumption. The average number of persons per household in Queensland is 2.7. The relationship for this average holds most closely for higher density urban areas, and there are a number of other factors which should be considered for other locations.

As an example, the median of all reported values for the potable water supplied per connection per annum was 555 kL per connection per annum, which can be converted as described above to 563 L per person per day. Note that this method considers only potable water supplied, and some locations may have alternative/ additional sources.

There are many reasons for higher consumption including water security (e.g. the primary source might be the Great Artesian Basin) and climatic factors. Outdoor water use is typically the highest contributor to high consumption.

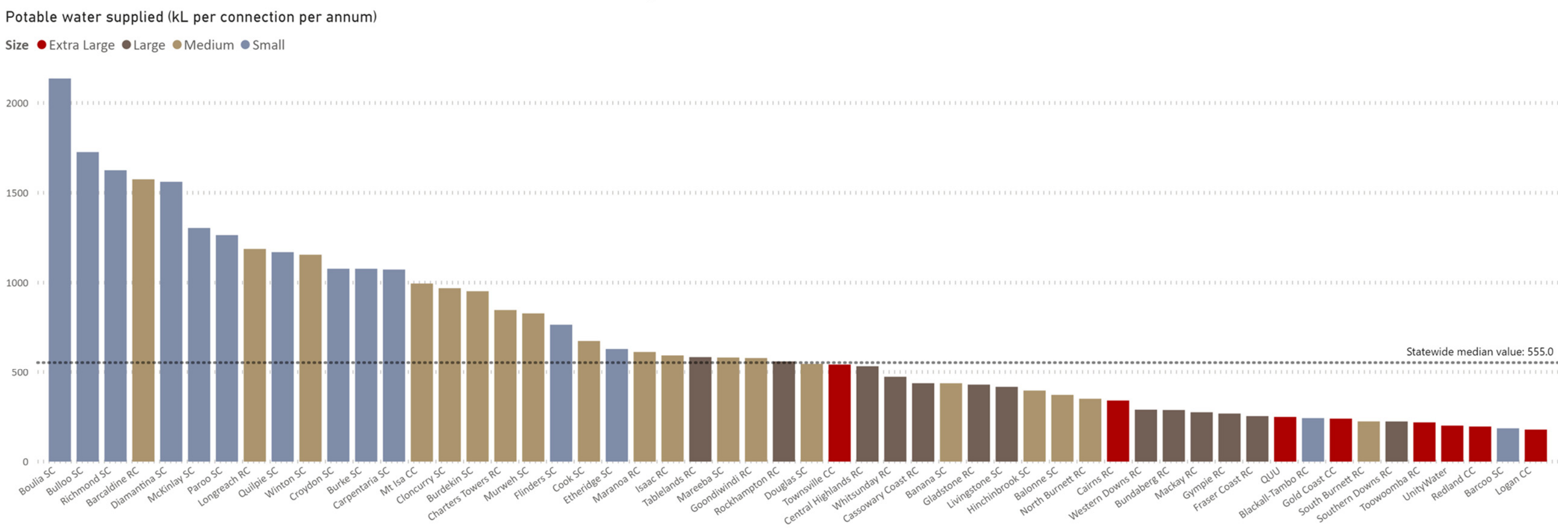


Figure 17: Potable water supplied (kilolitres per connection per annum). The statewide median value for potable water supplied for 2018/19 was 555 kilolitres per connection per annum. Each bar represents one SP.

3.4. References

NWC and WSAA (National Water Commission and Water Services Association of Australia). 2010. National Performance Report 2009-10: Urban Water Utilities, NWC, Canberra.

OTTER (Office of the Tasmanian Economic Regulator). 2011. Tasmanian Water and Sewerage State of the Industry Report 2009-10. Tasmanian Government, Hobart.

PC (Productivity Commission). 2011. Australia's Urban Water Sector, Report No. 55, Final Inquiry Report, Volume 1, Canberra.