2014 Water, Sewerage and Irrigation Performance Report

February 2015

Economic Regulation Authority
WESTERN AUSTRALIA

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Summary of Key Findings

Overview

The 2014 Water, Sewerage and Irrigation Performance Report is the latest in a series of annual reports[1] published by the Economic Regulation Authority (**ERA**) that examines the potable (drinking) water, sewerage and irrigation schemes in the State.

The report covers the 32 drinking water schemes and 22 sewerage schemes that supply more than 1,000 connected properties. The report also examines the performance of the State's two largest irrigators. The ERA separately publishes on its website the performance of the smaller service providers in the form of a set of data tables.[2]

Drinking Water Supply

Sources of Water

The drying climate has seen a shift away from surface water as a source of drinking water; in Perth desalination now supplies 38% of drinking water…

Drinking water is sourced from surface water (rivers and dams), groundwater, desalination, recycled water and bulk (purchased)[3] water suppliers. Between 2013 and 2014, the state-wide total volume of water sourced increased by 2.0% (from 383GL to 391GL), comprising a 1.8% rise in water sourced for Perth (from 291.5GL to 296.8GL), and a 2.4% rise in water sourced for regional towns (from 91.7GL to 93.9GL).

The total volume of sourced water is always higher than the total volume of water supplied to customers. The difference is because of "banked"[4] surplus water, and water losses (leaks in the distribution networks and metering inaccuracies). Between 2013 and 2014, the total volume of water supplied in Perth increased by 4.6% (to 260GL) and water supplied in regional towns increased by 2.1% (to 90GL).

In Perth, between 2013 and 2014, the proportion of water sourced from groundwater fell from 47.9% to 42.1% (from 139.6GL to 124.9GL) of the total. Water sourced from desalination increased from 32.9% to 38.1% (from 95.8GL to 113.1GL), the result of the Water Corporation's Binningup desalination plant going into full production in 2014.[5] The increasing use of desalination in Perth is a key outcome of the State Government's climate-independent water security strategy.

In regional towns, almost 90% of the water sourced to supply drinking water came from groundwater (58.6%) and bulk water (29.6%) in 2014. The remaining water was sourced from surface water (6.8%) and recycled water (5.0%).

The drying climate has seen a progressive shift away from surface water as a source of drinking water in regional towns. In 2013, for the first time, water sourced from bulk water suppliers overtook surface water as the second largest source of drinking water

[1] Each report covers the year ending 30 June.

[2] http://www.erawa.com.au/licensing/water-licensing/licence-statistics

[3] Bulk water means carted water purchased outside of the utility's area boundaries.

[4] Surplus water sourced from desalination is stored in dams until it is needed.

[5] Perth's two desalination plants are Kwinana (50GL maximum production capacity) and Binningup (100GL maximum production capacity).

in regional towns, and this trend has continued into 2014. Between 2009 and 2014, the volume of surface water has fallen from 20GL to 6.4GL, while bulk water supplies have increased from 16GL to almost 28GL.

Water Consumption

The long-term downward trend in the average water consumption per property in Perth was reversed in 2014...

Water consumption per property varies widely across the State, reflecting the variation in climate. Northern towns with high temperatures have higher consumption levels than towns in the cooler south-west of the State.

Between 2013 and 2014, average annual consumption in Perth increased by 2.0% (from 249kL to 254kL), whereas consumption in the regional towns fell, on average, by 0.6% (from 310kL to 308kL). Since 2009, average annual water consumption per property has fallen by 9% in Perth and by 13% in the regional towns.

In 2014, Port Hedland overtook Newman as the town with the highest average annual residential water consumption (511kL per property), an increase of 0.4% compared to 2013. Denmark continued to have the lowest average annual residential water consumption (161kL), despite consumption increasing by 9.5% since 2013.

Water Network Growth

Connections

Growth in water connections results in network expansion; state-wide connections grew by 3.2%…

Between 2013 and 2014, the total number of properties connected to water mains in the State grew by 3.2%, to reach 997,000 properties. The number of connections in Perth and regional towns grew by 3.0% (to 787,000 properties) and 4.0% (to 210,000 properties), respectively. Since 2009, the average annual growth in the number of connections in Perth and in regional towns has been 2.2% and 1.0% respectively.

Water Mains

Between 2013 and 2014, the length of water mains in Perth increased by 1.4% (to 13,859km), which is close to the six year average growth. The length of mains in Perth has increased from 12,861km to 13,859km between 2009 and 2014.

In 2014, there was an increase of 2.3% in the total length of water mains (to 5,584km) and a return to reported growth in the total length of water mains in regional towns. The net length of regional town water mains was reduced by 6.2% in 2013 following the Water Corporation's reclassification of pipe categories, and a review of the boundaries for each scheme.

Water Main Breaks

Frequency of water main breaks depends on local factors…

The level of water main breaks varies year by year as the number of breaks is often driven by local conditions, such as soil types, tree root intrusion or third party damage rather than the standard of maintenance. In 2014, Perth customers experienced an

average of 13.0 water main breaks per 100 km of water main, which is close to the six year average of 13.4 per 100 km of main.

In regional towns, the average level of main breaks climbed up by 10.2% (from 19.6 to 21.6) compared to 2013; the increase was, in part, driven by triple-digit percentage increases in four regional towns.[6] However, the average level of mains breaks (21.6) in regional towns remained close to the six year average (19.6 per 100 km of main).

Quality of Service

Water service complaints and water quality complaints reach new record low…

In 2014 in Perth, complaints relating to the quality of water and complaints relating to the reliability of supply (water service) remained at last year's record low levels, 0.1 and 0.3 per 1,000 properties, respectively.

In regional towns, the average level of complaints addressing water quality and water service both dropped to new record low levels. Water quality complaints dropped from 0.9 to 0.1 per 1,000 properties and water service complaints dropped from 0.8 to 0.1 per 1,000 properties. According to the three water utilities involved, Aqwest, Busselton Water and Water Corporation, the reductions in both complaints types are driven by changes in the method used to separate customer enquiries from complaints.[7]

2014 was the first year that Water Corporation reported against the new reporting framework for the frequency of water supply interruptions…

An unplanned interruption means that the customer's water supply is interrupted without at least a 24 hours' notice. In 2014, the average duration of unplanned interruptions in Perth was 117 minutes, down 9.8% on the 129.7 minutes reported in 2013, while in regional towns the average unplanned interruption lasted 88.4 minutes, up 3.4% on the 86.9 minutes reported in 2013.

The average frequency of unplanned interruptions is a measure of the number of customers who have experienced a loss of water supply due to an unplanned interruption during the year.

Since the reporting year 2012/13, water utilities have been required to also count customer connection interruptions (breaks occurring between the water main and the customer's meter) in addition to mains interruptions, when they calculate the average frequency, and duration, of interruptions.[8] Due to this change in the indicator definition, the average frequency of unplanned interruptions appears markedly higher in 2014.

Drinking water met all applicable quality standards…

All of the State's 61 supply zones continued to achieve 100% compliance with the drinking water quality standards; an ongoing achievement since 2009.

[6] Derby, Dunsborough/Yallingup, Jurien and Kununurra.
[7] The ERA will examine the complaints handling process in the next operational audit of each utility's licence.
[8] Due to an oversight, Water Corporation only commenced reporting on customer connection breaks in 2013/14 instead of 2012/13.

Sewerage Schemes

Sewage Collected and Recycled

Volumes of wastewater collected per property show a modest increase in 2014…

In 2014, the average property in Perth produced 190kL of sewage (up from 187kL in 2013), while the average property in regional towns produced 188kL of sewage (up from 185kL in 2013). Between 2013 and 2014, the state-wide total volume of sewage collected increased by 3.6% (up from 156GL to 162GL). Approximately 80% of the total volume of sewage was collected in Perth, with the remaining 20% being collected in regional towns.

Regional towns recycled more than half of their sewage effluent in 2014…

Most of the State's towns recycle at least some proportion of their treated sewage effluent (wastewater). Wastewater can be used, for example, to irrigate the town's parks and ovals; or for agricultural, industrial or commercial uses. The use of treated wastewater saves water that has been treated to a standard suitable for drinking.

In 2014, the regional towns recycled, on average, 54.5% of sewage effluent (up from 54.1% in 2013). There were six regional towns that recycled 100% of their effluent in 2014.[9] Perth was one of five centres that recycled less than 10% of their effluent in 2014;[10] in Perth, 7.4% of effluent was recycled (down from 7.9% in 2013).

Only modest growth in total volume of recycled wastewater supplied since 2011…

Total recycled water supplied is the sum of all treated effluent that is used for purposes other than to supply drinking water, either by the water utility itself, or supplied to another business. The volume of recycled water supplied can be considered to be an indirect measure of the volume of drinking water or non-potable water saved.[11]

Between 2009 and 2014, the total volume of recycled water supplied has grown from 10.6GL to 11.9GL in regional towns and from 7.6GL to 10GL in Perth. However, the growth mainly occurred between 2007 and 2011. The state-wide total volume of wastewater supplied for further use has only grown by 1GL between 2011 and 2014.

In 2014, the commercial, municipal and industrial sector (52.8%) was the largest user of recycled water, followed by agricultural sector (23.4%) and onsite reuse (12.6%).

Sewerage Network Growth

Connections and Sewer Mains

Customer growth leads to network expansion and increased sewer connections…

Since 2009, the average annual growth of sewerage connections has been 1.7% in Perth and 1.0% in the regional towns. In 2014, the total length of sewer mains and channels grew by 1.7% (to 11,637 km) in Perth and by 3.9% (to 3,467km) in regional towns.[12] Between 2009 and 2014, just over 1,000 km of new sewer mains have been

[9] Albany, Australind/Eaton, Broome, Dunsborough, Kununurra and Merredin.

[10] Bunbury, Collie, Jurien, Mandurah and Perth.

[11] That might have been supplied had recycled water not been available.

[12] Last year's reported reduction in the length of mains in regional towns was the result of a review of town boundaries, which removed some mains from the total count.

constructed in the State, an increase of 7.4%. In 2014, the number of connected sewerage properties grew by 2.1% (to 713,000) in Perth, and by 4.7% (to 156,000) in regional towns.[13]

Between 2009 and 2014, the spatial density of properties - the number of property connections per km of sewer main – has grown from 59 to 61 in Perth and from 43 to 44 in regional towns.

The number of sewer main breaks and chokes remains unchanged…

Sewer main breaks and chokes (partial or total blockages) can indicate the standard of maintenance of the network. However, chokes often occur due to customer actions (e.g. non-soluble objects flushed down the toilet).

In 2014, the level of breaks and chokes in Perth rose by 5.6% (to 17.0 per 100 km of main), but remained below the five year average of 18.6 per 100 km of main. On average, the level of breaks and chokes in regional towns is approximately 35% higher than in Perth. The level of breaks and chokes in regional towns fell by 1.6% (to 24.2 per 100km of main) in 2014, below the five year average of 25.3 per 100 km of main.

Quality of Service

Sewerage service complaints fall to a record low…

The levels of sewerage service complaints in Perth and in the regional towns, on average, have continued the long-term downward trend. Between 2009 and 2014, the level of sewerage service complaints in Perth has fallen from 6.2 to 0.1 per 1,000 properties, while in regional towns complaints have fallen from 7.5 to 0.3 (per 1,000 properties).

All except one of the State's 22 sewerage schemes are operated by Water Corporation. The reasons for the reduction in the level of complaints recorded by Water Corporation are discussed under water quality and water service complaints.

The frequency of sewer overflows fluctuates in accordance with weather events…

The number of sewer overflows that have been reported to the environmental regulator each year varies widely. The variation appears to be mostly driven by adverse weather events (such as storms or flooding), and local conditions rather than sewer infrastructure maintenance issues.

In Perth, the level of sewer overflows remained low in 2014 (0.2 per 100 km of sewer main), which is below the six year average of 0.3 per 100km of sewer main. In 2014, the number of sewer overflows in regional downs fell sharply, down from 16.2 to 4.5 per 100 km of sewer main, a six year low.

Environmental Compliance

The majority of sewage treatment plants achieved full compliance with their environmental licence standards…

[13] There are less sewerage connected properties than there are water connected properties in the State. The difference between the two is because not all properties are connected to sewer mains, instead the property is served by an on-site septic tank.

In 2014, 31 of the 38 monitored sewerage treatment plants were compliant with their environmental licence conditions at all times throughout the year.[14] Seven towns did not achieve full compliance because they failed to meet the standards prescribed in the relevant licence. Three of the five non-compliant towns (Australind/Eaton, Kalgoorlie-Boulder and Karratha) have not achieved full compliance for three years.

Combined Water and Wastewater Performance

In some towns the water and sewerage services are provided by separate utilities, but in 35 towns the same utility is responsible for both services. This section of the report covers the performance indicators applicable to the combined water and sewerage service.

Quality of Service

The level of complaints remained low…

In those towns where the water and sewerage service is provided by the same utility, the water and sewerage complaints are combined to provide an overall picture of customer satisfaction with the service provided by the utility. The earlier discussion[15] regarding water complaints and sewerage complaints has disclosed the substantial fall in the level of complaints received in Perth and regional towns in 2014. The reductions in the separated water and sewerage complaints have fed through to similar reductions in the combined complaints data.

In Perth, the level of complaints has plunged from 38.0 per 1,000 connected properties in 2009 to 1.0 per 1,000 connected properties in 2014. In regional towns, the reduction has been from 25.9 in 2009 to 0.9 in 2014.

The percentage of calls answered within 30 seconds by a Water Corporation operator fell to a seven-year low in 2014…

Water Corporation is the only water service provider in Western Australia that operates a state-wide customer call centre, covering both water and sewerage enquiries.

In 2014, 72.6% of telephone calls to the Water Corporation call centre were answered within 30 seconds, down from 73.1% in 2013. The percentage of calls that are answered within 30 seconds has decreased during past six years: in 2009, 82.4% of calls were answered within 30 seconds.

Irrigation

This section of the report details the performance of the State's two largest irrigators: Harvey Water,[16] who operate three irrigation networks in areas around Harvey in the south west, and Ord Irrigation Cooperative, who supply customers in the area to the south of Kununurra in the far north.

[14] The exceptions were Australind/Eaton, Kalgoorlie-Boulder, Collie, Karratha, Manjimup, Northam and South Hedland. Some towns have more than one sewage treatment plant, which explains why the total number of sewage treatment plants exceeds the number of towns.

[15] Refer to the *Quality of Service* on pages iii and v of this Summary of Key Findings.

[16] Harvey Water is the trading name of the South West Irrigation Management Cooperative (SWIMCO).

Water Supply

Mixed results for the State's two largest irrigators in 2014…

The total volume of water supplied by Harvey Water grew by 34.7% (from 41.8GL to 56.3GL) in 2014, the first annual increase in water supplied since 2010. The fall in supply in previous years was the result of reduced water allocations and contraction in the local dairy industry.

The volume of water supplied by Ord Irrigation fell by 4.8% (from 100.6GL to 95.8GL) in 2014, which was a six-year low. The volume of water supplied by Ord Irrigation has progressively declined over the past seven years due to a fall in demand from customers, the result of changes in land use.[17]

Customers and Quality of Service

The size of the customer base almost unchanged; customers are satisfied with the irrigators…

Between 2013, and 2014, the number of customer service points on the Harvey Water networks grew from 1,751 to 1,759 (or 0.5%), while customer service points on the Ord Irrigation networks fell from 271 to 269 (or -0.7%). Customer complaint numbers have traditionally been low or non-existent for both irrigators; this was unchanged in 2014.

[17] There has been an increase in the amount of land used for silviculture in recent years. The decline in water demand for silviculture has fallen as plantations mature.

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Purpose of the Report

The purpose of this report is to bring transparency and accountability to the performance of the providers of water, sewerage and irrigation services in Western Australia.

This is the latest in a series of annual reports that examine the performance of water, sewerage and irrigation service providers in Western Australia that has been published by the ERA.[18]

This report focuses on water service supply schemes (towns) with greater than 1,000 connected properties (see Parts A and B for details of these schemes). Data for water service schemes with less than 1,000 connected properties can be found on the Authority's website.[19]

The Economic Regulation Authority (**ERA**) is the independent economic regulator for Western Australia.

The ERA licenses providers of gas, electricity and water services and monitors compliance with licensing conditions and other related regulatory obligations. The ERA also assesses the terms and conditions, including prices, offered by owners of monopoly infrastructure to third parties in the gas, electricity and rail industries.

In addition, the ERA has a range of responsibilities in gas retailing and surveillance of the State's wholesale electricity market.

The objectives of this report are to:

- report on the performance of water, sewerage and irrigation supply schemes operated by Western Australian water service providers that are licensed by the ERA;
- highlight comparative performance outcomes for the different towns covered by the report; and
- examine service performance over time.

Throughout the report, the term 'all towns' refers to all of the towns that are captured by the indicator in question, including Perth. The term 'regional towns' means all of the towns and cities that are captured by the indicator in question, excluding Perth.

Reference to a year in the report should be read as the 12-month period ending 30 June in that year.

[18] The ERA commenced publishing reports in their current form in 2007. Prior to that the ERA published a report in 2005, but the content and format was significantly different from the later reports.

[19] http://www.erawa.com.au/licensing/water-licensing/licence-statistics

Background

Water Services Licences

There are four classes of water service that require a licence:

- water supply services (covers both potable and non-potable services)
- sewerage services
- irrigation services, and
- drainage services.

A licence may be granted for more than one class of service, e.g. a sewerage and water supply licence may be granted to a sewerage service provider to enable them to supply recycled effluent.

The licence specifies the area(s) of the State in which the service is to be provided. Where a licence covers more than one service it is possible for the operating area for each service to be different.

Prior to 17 November 2013, the *Water Services Licensing Act 1995* (**1995 Act**) was the legislation regulating the water services licensing scheme. From 18 November 2013, the *Water Services Act 2012* (**2012 Act**) repealed and replaced the licensing provisions in the 1995 Act.

Part 2 of the 2012 Act requires service providers to obtain a licence to provide a water service, and outlines the duties of licensees. The latter includes the obligation to provide services in accordance with the licence.

Part 2 of the 2012 Act also sets the requirement for regular independent audits of the licensee's compliance with the licence, and the effectiveness of the system used to manage the assets covered by the licence.

Section 12(s) of the 2012 Act makes provision for licences to include conditions requiring licensees to give information to the ERA relevant to the ERA's functions under the Act. Water supply, sewerage, irrigation and drainage licences include conditions requiring the licensee to provide to the ERA non-financial performance data on an annual basis.

The data to be provided by licensees was previously specified in the ERA's *Water Compliance Reporting Manual* (**Reporting Manual**). From April 2014, the specification of non-financial performance reporting data was moved to the *Water, Sewerage and Irrigation Performance Reporting Handbook* (**Reporting Handbook**).

Current Structure of Water Services Industry in WA

There are 33 licensed water service providers in the State:

- Aquasol Pty Ltd: W, S
- Bunbury Water Corporation (trading as **Aqwest**): W
- Busselton Water Corporation (trading as **Busselton Water**): W
- Hamersley Iron: W, S
- Moama Lifestyle Villages Pty Ltd: W (non-potable), S
- Peel Water: W
- Rottnest Island Authority (RIA): W, S, D
- Shire of Denmark: W (non-potable)
- Water Corporation: W, S, I, D
- 19 local government authorities: W (non-potable), S
- Gascoyne Water Cooperative (Gascoyne Water) W (non-potable), I
- South West Irrigation Management Cooperative (Harvey Water) W (non-potable), I
- Ord Irrigation Cooperative (Ord Irrigation) W (non-potable), I
- Preston Valley Irrigation Cooperative (Preston Valley): W (non-potable), I.

Key:
W = Water supply services
S = Sewerage services
I = Irrigation services
D = Drainage services

The four largest water services providers in the State are Aqwest (in Bunbury), Busselton Water, City of Kalgoorlie-Boulder and Water Corporation.

Water Corporation was established by the *Water Corporation Act 1995* and it is owned by the Western Australian Government. They are the State's largest water service provider, servicing over 1 million connected properties or over 2 million people, and managing more than $15.9 billion of water supply, sewerage, drainage and bulk water (for irrigation) assets.[20]

Aqwest and Busselton Water both became corporations in November 2013.[21] They service approximately 16,500 and 11,600 connected properties, and manage infrastructure of approximately $89.1 million and $64 million, respectively.[22]

The City of Kalgoorlie-Boulder provides sewerage services to the town of Kalgoorlie-Boulder. The City services approximately 14,000 connected properties and manages approximately $24 million in sewerage and water infrastructure.[23]

Performance Reporting Obligations

National Water Initiative Agreement

In April 2006, Western Australia became a signatory of the National Water Initiative Agreement (NWI Agreement), joining the Commonwealth and the other States and Territories.

Under the NWI Agreement, the signatories agreed to report independently, publicly and on an annual basis, benchmarking data on the pricing and service quality of urban and rural

[20] Water Corporation Annual Report 2014, accessed on 2 December 2014.

[21] Until November 2013, Aqwest and Busselton Water were government statutory authorities operating under the *Water Boards Act 1904* (1904 Act). Following amendments to the 1904 Act, both Aqwest and Busselton Water became corporations, although they continue to trade under the same names.

[22] Aqwest Annual Report 2013 and Busselton Water Annual Report 2013, accessed on 2 December 2014; Busselton Water Annual Report 2014 was not available at the time of writing of this report.

[23] The City of Kalgoorlie-Boulder Annual Report 2013, accessed 2 December 2013. The Annual Report 2014 was not available at the time of writing of this report.

water delivery agencies. The signatories to the NWI Agreement have developed performance reporting frameworks for urban utilities (**Urban Framework**) and for rural water delivery agencies (**Rural Framework**).

The States and Territories are represented in the NWI by the agencies that are responsible for regulating water supply services in that jurisdiction. The ERA performs the roles of both the Data Coordinator and Audit Coordinator for Western Australia.

The original signatory representing the Commonwealth in the NWI was the National Water Commission (**NWC**). In September 2014, the Australian Government made a decision to introduce the *National Water Commission (Abolition) Bill 2014* to the Senate, but the bill did not pass. Nevertheless, the responsibility to administer the Urban Framework was transferred solely to the Bureau of Meteorology (**BOM**). Concurrently, the parties to the NWI Agreement decided to discontinue reporting against the Rural Framework because of the limited ability to compare the performance of the rural water service providers covered by the Framework.

The Urban Framework comprises a handbook with performance indicators and definitions, which are revised and published annually. Further information on the NWI Agreement and the Urban Framework can be found on the NWC's website.[24]

The Urban Framework captures all urban utilities that service 10,000 or more connected properties. In Western Australia there are four licensees that are captured by the Urban Framework: Aqwest (water only), Busselton Water (water only), City of Kalgoorlie-Boulder (sewerage only) and the Water Corporation (water and sewerage).[25]

The licences of the service providers that are captured by the NWI Urban Framework include a condition requiring these licensees to provide the ERA with annual performance data in accordance with the Framework.

Water Performance Reporting Handbook

The Reporting Handbook that was current during the 2014 reporting period was published by the ERA in June 2013. The Reporting Handbook sets out standard performance reporting obligations for each type of supply service: potable water, non-potable water, sewerage and irrigation.[26]

In the case of service providers, who are captured by the Urban Framework, the reporting requirements are aligned with the Framework. The ERA has also published MS Excel workbooks to collect data from the service providers.

[24] http://nwc.gov.au/

[25] The Water Corporation services eight towns that are captured by the Urban Framework: Albany, Australind/Eaton (water only), Bunbury (sewerage only), Busselton (sewerage only) Geraldton, Kalgoorlie-Boulder (water only), Mandurah and Perth.

[26] Drainage licences include service and performance standards in relation to drainage services, however, licensees are not required to include these in their annual licence performance report.

PART A: WATER PERFORMANCE INFORMATION

Covered Water Supply Schemes

Water supply schemes with greater than 1,000 connected properties in Western Australia are:

Albany Scheme	**Denmark**	**Kalgoorlie-Boulder**	**Narrogin**
Australind-Eaton	**Derby**	**Karratha**	**Newman**
Bridgetown-Hester	**Dongara -Denison**	**Katanning**	**Northam**
Broome	**Dunsborough**	**Kununurra**	**Perth**
Bunbury	**Esperance**	**Mandurah Scheme**	**Pinjarra**
Busselton	**Geraldton**	**Manjimup**	**Port Hedland**
Carnarvon	**Harvey-Wokalup**	**Margaret River Scheme**	**South Hedland**
Collie	**Jurien**	**Merredin**	**York**

With the exception of Bunbury and Busselton, which are supplied by Aqwest and Busselton Water respectively, the abovementioned town water supply schemes are supplied by the Water Corporation.

Water is supplied from a number of different sources, which comprise the following:

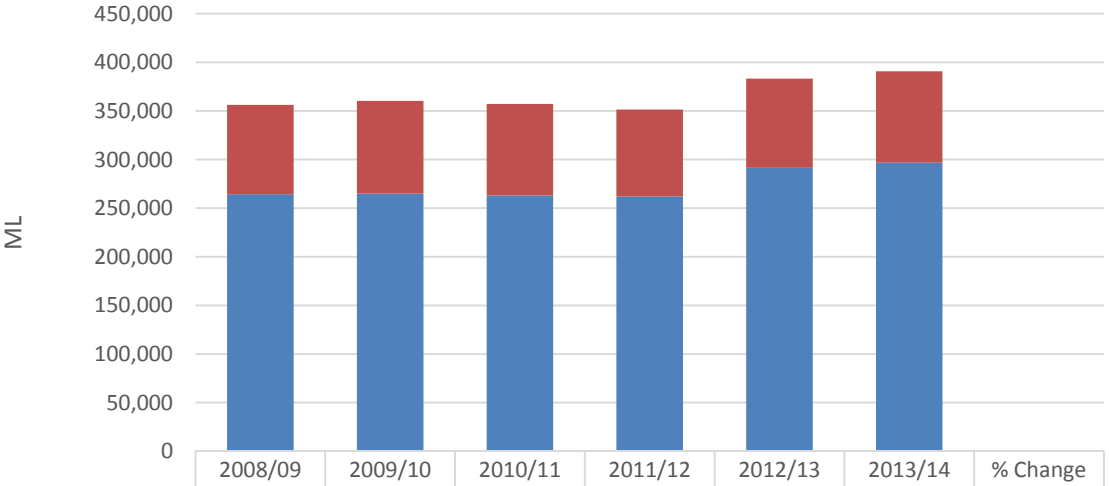
- **Groundwater** - potable and non-potable water abstracted from aquifers and other 'below ground' water sources. This excludes volumes sourced from groundwater supplies that have been artificially recharged using sources of water that have been counted elsewhere i.e., from rivers, desalination plants or sewage plants (recycling).
- **Surface water** - potable and non-potable water abstracted from surface water sources such as dams, rivers or irrigation channels.
- **Desalination** - potable and non-potable water sourced from desalination plants.
- **Bulk supplier** - potable and non-potable water purchased from another utility or entity outside a utility's geographic area of responsibility. The volume of water may include water which is subsequently exported (sold) to another utility.
- **Recycling** - treated effluent that is used by either the water utility itself, a business supplied by the water utility or supplied through a third party pipe system for urban reuse.

Sources of Water

Total sourced water includes water abstracted from water sources that include surface water, groundwater, desalination, recycled water and water received from a bulk supplier. The difference between sourced and supplied water is caused by the water loss due to water main breaks and leaks in the network, as well as metering inaccuracies.

Figure 1 shows that, compared to 2013, total water sourced for all towns in 2014 increased by 2.0% (from 383,171ML to 390,724ML), comprising a 1.8% rise in water sourced for Perth, and a 2.4% rise in water sourced for other towns.

Figure 1: Total volume of water sourced from all sources



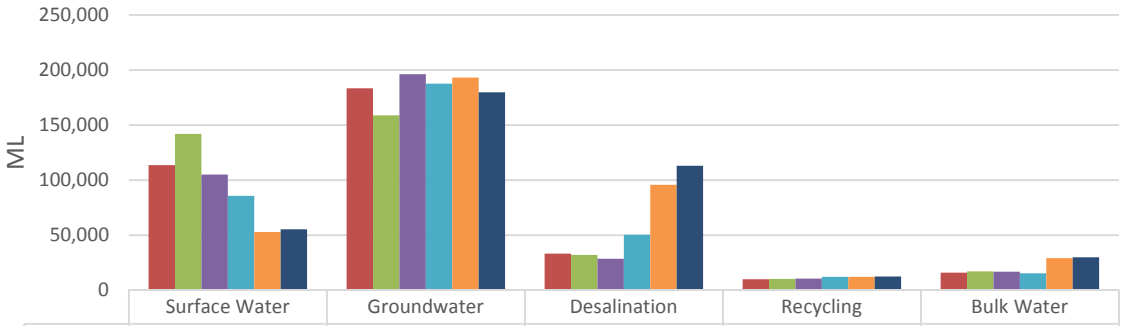
	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	% Change
Regional Towns	91,875	95,265	94,175	89,264	91,698	93,900	2.4%
Perth	264,352	264,995	263,039	262,134	291,473	296,824	1.8%

Figure 2 and **Figure 3** detail the sources of water for all towns.

Figure 2 shows that the volume of water sourced from surface water increased from 52.9GL to 55.4GL between 2013 and 2014. However, the total volume of surface water has dropped by 58.3GL (from 113.6GL) since 2009. The volume of water sourced from groundwater also decreased by 13.3GL between 2013 and 2014.

2014 was the third consecutive year where water sourced from desalination increased markedly (up by 18.1% in 2014). The increased volume of water sourced from desalination was largely offset by a drop in the volumes of water sourced from groundwater and surface water.

Figure 2: Sources of water by volume (all towns)

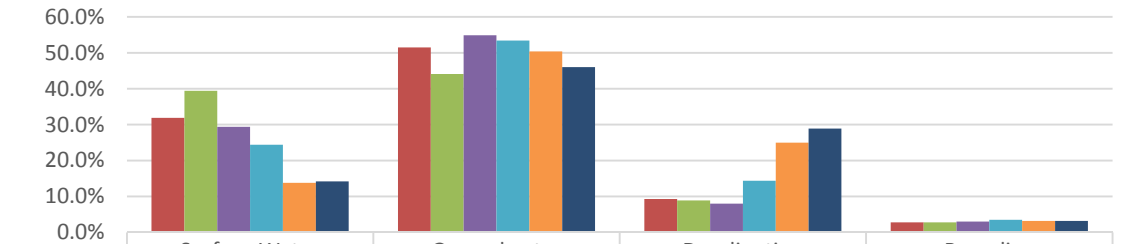


	Surface Water	Groundwater	Desalination	Recycling	Bulk Water
2008/09	113,634	183,510	33,160	10,005	15,918
2009/10	142,065	158,863	32,034	10,232	17,066
2010/11	105,090	196,208	28,541	10,608	16,767
2011/12	85,749	187,691	50,458	12,185	15,315
2012/13	52,885	193,191	95,770	12,119	29,206
2013/14	55,382	179,857	113,060	12,488	29,937

Figure 3 shows that, in 2014, desalinated water accounted for almost one third of the water sourced (28.9%), which is up from 25% in 2013. The increase in water sourced from desalination is the result of the Water Corporation's Binningup desalination plant going into full production. The aggregate capacity of Water Corporation's desalination plants at Binningup and Kwinana is 150GL per annum, which is equivalent to 40% of total sourced water in 2014.

The proportion of water sourced from groundwater fell in 2014, reaching levels not seen since 2010. The proportion of the drinking water sourced from surface water increased slightly in 2014, arresting the long term downward trend in sourcing drinking water from dams.

Figure 3: Sources of water by percentage (all towns)



	Surface Water	Groundwater	Desalination	Recycling
2008/09	31.9%	51.5%	9.3%	2.8%
2009/10	39.4%	44.1%	8.9%	2.8%
2010/11	29.4%	54.9%	8.0%	3.0%
2011/12	24.4%	53.4%	14.4%	3.5%
2012/13	13.8%	50.4%	25.0%	3.2%
2013/14	14.2%	46.0%	28.9%	3.2%

An examination of **Figure 3** shows that groundwater continues to be the dominant source of drinking water; over the past seven years, groundwater has supplied on average just over half of the total annual water sourced.[27] Desalination has overtaken surface water as the

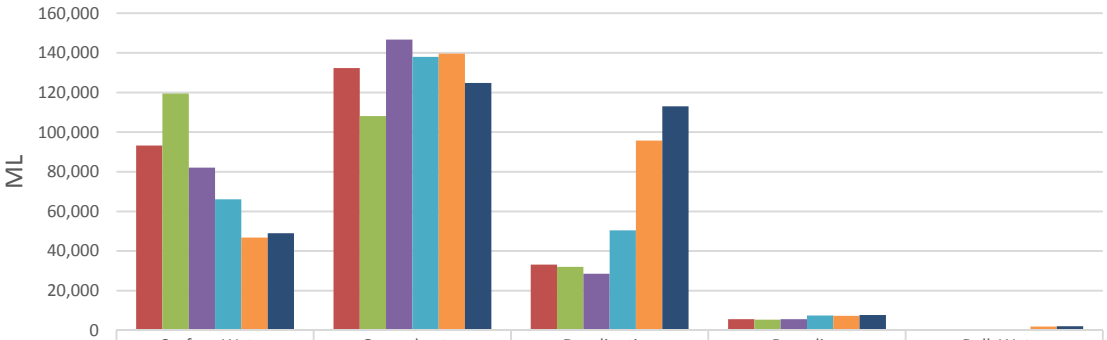
[27] The proportion of water sourced from groundwater in 2008 was 51.7%

second largest source of the State's drinking water. Water sourced from desalination is exclusively used to supply Perth's drinking water.

Figure 4 and **Figure 5** focus on the sources of drinking water for Perth. Groundwater continues to be the dominant source of water for Perth's drinking water supply. While in 2013 groundwater supplied close to half (47.9%) of Perth's drinking water, by 2014 this had fallen to 42.1% of the total. Water sourced from desalination is now established as the second largest source of Perth's drinking water, water sourced from desalination increased by 18.1% in 2014, and now accounts for 38.1% of the total.[28]

The shift away from surface water towards desalination as a source of drinking water is the result of the Government's water security strategy designed to tackle the effects of the State's drying climate.

Figure 4: Sources of water by volume (Perth only)



	Surface Water	Groundwater	Desalination	Recycling	Bulk Water
2008/09	93,266	132,298	33,160	5,628	0
2009/10	119,469	108,104	32,034	5,388	0
2010/11	82,117	146,745	28,541	5,636	0
2011/12	66,156	138,030	50,458	7,490	0
2012/13	46,786	139,622	95,770	7,356	1,939
2013/14	49,025	124,850	113,060	7,767	2,121

Recycling is another important climate independent source of water. Examination of **Figure 5** shows that the percentage of Perth's water sourced from recycling has remained rather steady for the last three years, with an increase of 5.5% between 2013 and 2014.

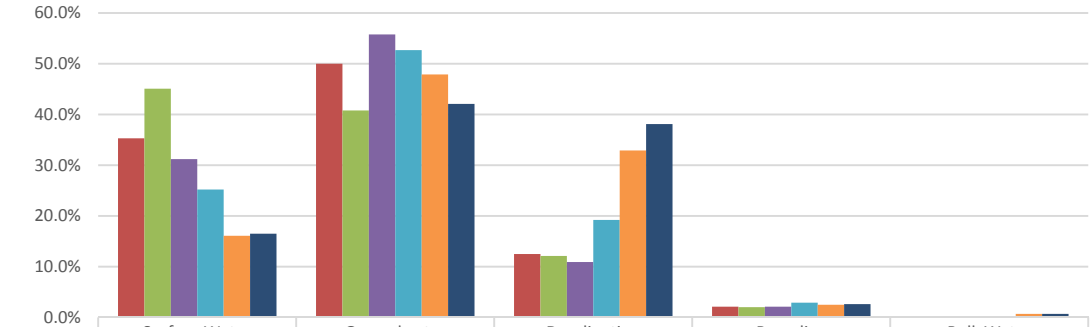
The volume of water sourced from recycled water is expected to rise when the Water Corporation brings its new groundwater replenishment plant into service in 2016. Stage 1 of the project will be capable of recharging up to 7GL of water into underground aquifers, with the potential to quadruple the output from now to 28GL in future years.[29] The State Government has recently acknowledged the potential for recycled water to supply up to 20% of Perth's drinking water by 2060.[30]

[28] Water Corporation informed the Authority in 2013 that the use of groundwater, desalinated and surface water has not changed drastically, but there has been a change how it is measured. If groundwater or desalinated water was not sent directly to customers, it was "banked", i.e. stored in the dams. When the water was used from the dams, it was reported as surface water, not groundwater or desalinated water. This led to an under reporting of the usage of groundwater and desalinated water and an over reporting of surface water. Water Corporation's new methodology identifies the different sources of water.

[29] Water Corporation website, Groundwater Replenishment Scheme – Stage 1, accessed on 14 April 2014.

[30] Government of Western Australia website, Media Statement on 22 October 2014: *Works start on advanced water recycling plant*; accessed on 5 November 2014.

Figure 5: Sources of water by percentage (Perth only)

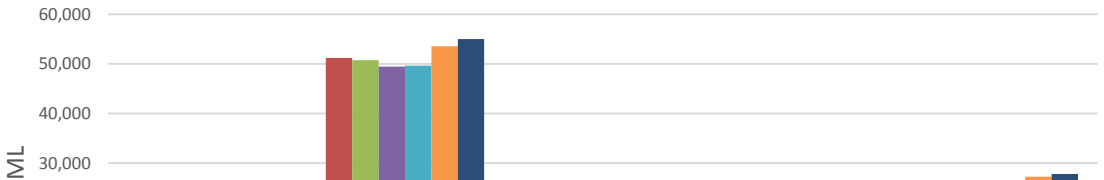


	Surface Water	Groundwater	Desalination	Recycling	Bulk Water
2008/09	35.3%	50.0%	12.5%	2.1%	0.0%
2009/10	45.1%	40.8%	12.1%	2.0%	0.0%
2010/11	31.2%	55.8%	10.9%	2.1%	0.0%
2011/12	25.2%	52.7%	19.2%	2.9%	0.0%
2012/13	16.1%	47.9%	32.9%	2.5%	0.7%
2013/14	16.5%	42.1%	38.1%	2.6%	0.7%

Figure 6 and **Figure 7** detail the sources of drinking water for regional towns. As is the case in Perth, groundwater is the dominant source of water in regional towns; in 2014, drinking water sourced from groundwater reached 58.6% of the total volume, which is a seven year high.[31]

The drying climate has resulted in a shift away from surface water sources not only in Perth but also in regional towns. In 2013, water sourced from bulk water suppliers overtook surface water as the second source of drinking water in regional towns for the first time, and this trend has continued into 2014. Between 2009 and 2014, the volume of sourced from surface water has fallen from 20GL to 6.4GL, while bulk water supplies have increased from 16GL to almost 28GL.

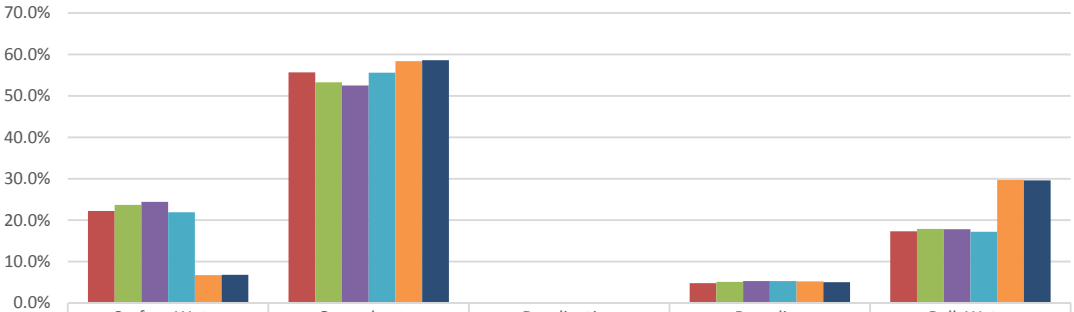
Figure 6: Sources of water by volume (Regional Towns)



	Surface Water	Groundwater	Desalination	Recycling	Bulk Water
2008/09	20,368	51,212	0	4,377	15,918
2009/10	22,596	50,759	0	4,844	17,066
2010/11	22,973	49,463	0	4,972	16,767
2011/12	19,593	49,661	0	4,695	15,315
2012/13	6,099	53,569	0	4,763	27,267
2013/14	6,357	55,007	0	4,721	27,816

[31] The volume of water sourced from groundwater in 2008 was 47,945ML.

Figure 7: Sources of water by percentage (Regional Towns)



	Surface Water	Groundwater	Desalination	Recycling	Bulk Water
2008/09	22.2%	55.7%	0.0%	4.8%	17.3%
2009/10	23.7%	53.3%	0.0%	5.1%	17.9%
2010/11	24.4%	52.5%	0.0%	5.3%	17.8%
2011/12	21.9%	55.6%	0.0%	5.3%	17.2%
2012/13	6.7%	58.4%	0.0%	5.2%	29.7%
2013/14	6.8%	58.6%	0.0%	5.0%	29.6%

Uses of Water Supplied

Total Urban Water Supplied

Total urban water supplied means the total metered volume of water (potable or non-potable), supplied to customers over the reporting period, plus estimated non-metered water supplied.

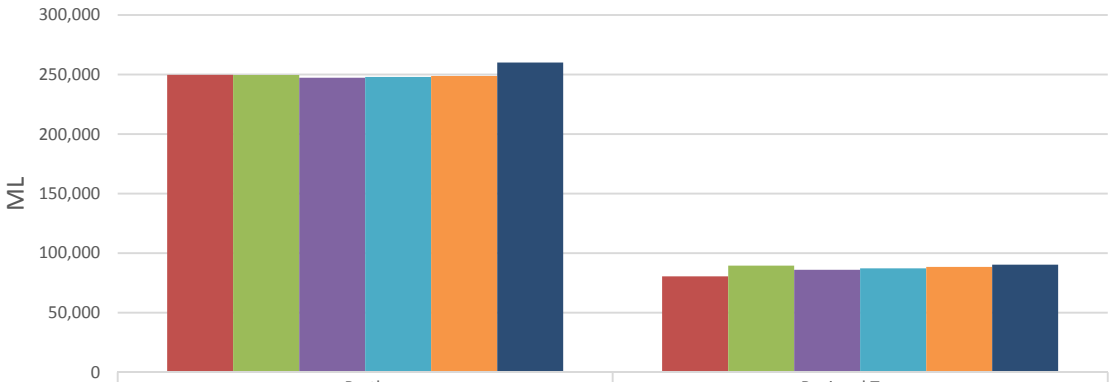
Total urban water includes residential, commercial, municipal and industrial water supplied and estimated water supplied for other purposes. The difference between sourced and supplied water is the real water losses caused by mains breaks and leaks, as well as metering errors.

Figure 8 details the total urban water supplied in Perth and regional towns. Between 2013 and 2014, the volume of water supplied in Perth grew by 4.6%, and water supplied in regional towns rose by 2.1%. This is broadly in line with the population growth. The latest available statistics show that, between 2012 and 2013, the population of the greater Perth area (from Yanchep to Mandurah) grew by 3.5%, while the population in the regional areas grew by 2.6%.[32]

Urban water supplied in Perth accounted for 74.2% of the state-wide total, a ratio that has been relatively constant over the past seven years. The proportion of water consumption in Perth is consistent with the State's population distribution: 78% of the population live in the greater Perth area.

[32] Australian Bureau of Statistics website, publication *3218.0 Regional Population Growth, Australia 2012-13* (published 3 April 2014). Accessed 5 November 2014.

Figure 8: Total urban water supplied



	Perth	Regional Towns
2008/09	249,756	80,575
2009/10	249,612	89,582
2010/11	247,303	85,980
2011/12	248,021	87,277
2012/13	248,818	88,437
2013/14	260,142	90,272

Average Annual Residential Water Supplied

Table 1 details the average annual residential water supplied. The average annual residential water supplied per property in Perth rose slightly in 2014, by 2.0%, breaking the downward trend over recent years.

The average water consumption in regional towns continued its downward trend, consumption in 2014 fell by 0.6%. The long term trend correlates with the introduction of permanent water savings measures across the State, although the rate of decline in the past two years has been lower than in previous years.

Table 1: Average annual water supplied per property (kL/property)

	2009	2010	2011	2012	2013	2014
Perth	277	276	264	250	249	254
Regional Town Average	348	360	327	313	310	308

In 2014, Port Hedland overtook Newman as the town with the highest average annual residential water consumption (511kL), an increase of 0.4% compared to 2013. The average consumption in Newman fell from 565kL in 2013, to 506kL in 2014.

Denmark continues to have the lowest average annual residential water consumption; however, the consumption per property in 2014 (161kL) is 9.5% higher than in 2013 (147kL).

The difference in the water consumption patterns for high and low residential consumption towns correlates with the climatic conditions across the State; towns in the north have higher annual average temperatures, and higher consumption levels, than towns in the cooler south-west of the State.

Asset Data

Water Mains

Table 2 examines the length of water mains in the State. There is loose correlation between population increase and growth in water mains networks, which is driven by the development of new homes. Since 2009, the length of water mains in Perth has grown by an average of 1.5% per annum. The 1.4% increase in mains recorded in 2014 is in line with this long term trend.

The length of water mains in regional towns grew by 2.3% in 2014. The decrease in the length of mains in 2013 was due to the reclassification of pipe categories, and a review of town boundaries for each supply scheme, rather than from real reduction in water mains. The largest increase in the mains network during 2014 occurred in Katanning (up by 8.3%), followed by Harvey/Wokalup (up by 6.8%). Conversely, the length of the networks in Manjimup and Bridgetown/Hester fell, by 9.5% and 2.4% respectively, due to administrative adjustments.

Table 2: Length of water mains (km)

	2009	2010	2011	2012	2013	2014	% change
Perth	12,861	12,997	13,198	13,292	13,673	13,859	1.4%
Regional Towns	5,543	5,621	5,732	5,817	5,457	5,584	2.3%
Total	18,404	18,618	18,930	19,109	19,130	19,443	1.6%

Properties Connected per km of Water Main

The purpose of this indicator is to report on the spatial density of properties served by water mains.

Table 3 shows that the spatial density of properties served by water mains in Perth, and in regional towns has steadily increased since 2009.

The spatial density of connected properties increased in Perth by 1.8% in 2014, while the average spatial density of connected properties in regional towns was unchanged. Looking at the town by town results in the regions, Newman and South Headland recorded the highest growth in spatial density, recording increases of 8.7% and 8.1%, respectively, while Katanning and Harvey/Wokalup recorded falls of 5.7% and 5.0%, respectively.[33]

Table 3: Properties served per km of water main

	2009	2010	2011	2012	2013	2014
Perth	55	56	56	56	56	57
Regional Town Average	31	31	32	30	33	33

In 2014, Perth had the highest density of properties served (57 per km of main), which is consistent with the relatively high property densities in the metropolitan areas. Other high density areas in the State are Mandurah (51 per km of main), Newman (50 per km main), Karratha (46 per km main) and Kalgoorlie-Boulder (45 per km main).

[33] The falls in spatial density for Katanning and Harvey/Wokalup are the direct result of the increase in water mains length in these towns.

Bridgetown/Hester had the lowest density of properties served (13 per km of main), while the average of the remaining towns was 31 properties per km of main.

Water Main Breaks

The level of water main breaks is influenced by a number of factors, including the type of mains infrastructure (above ground or below ground), the age of the mains, the standard of maintenance carried out by the service provider, and local conditions such as soil types and penetrating tree roots.

Table 4 shows that, compared to 2013, the level of mains breaks in Perth fell by 2.3% to 13.0 (per 100 km of main) in 2014, whereas the average level of mains breaks in regional towns increased by 10.2% (21.6 per 100km of main); in part, driven in part by triple-digit percentage increases in mains breaks in Jurien (290.2%), Derby (197.3%), Kununurra (170.3%) and Dunsborough/Yallingup (115.2%).[34]

Conversely, there were significant reductions in mains breaks in the towns of Harvey/Wokalup (54.5%), Newman (46.4%) and Mandurah (36.5%).[35]

In total, the level of breaks in Perth and in the regional towns, on average, remained close to the six year average of 13.4 and 19.6 per 100 km of main, respectively.

Table 4: Water main breaks (per 100km of water main)

	2009	2010	2011	2012	2013	2014
Perth	15.3	13.4	12.7	12.5	13.3	13.0
Regional Town Average	18.7	18.7	18.8	20.2	19.6	21.6

Connected Properties – Water Supply

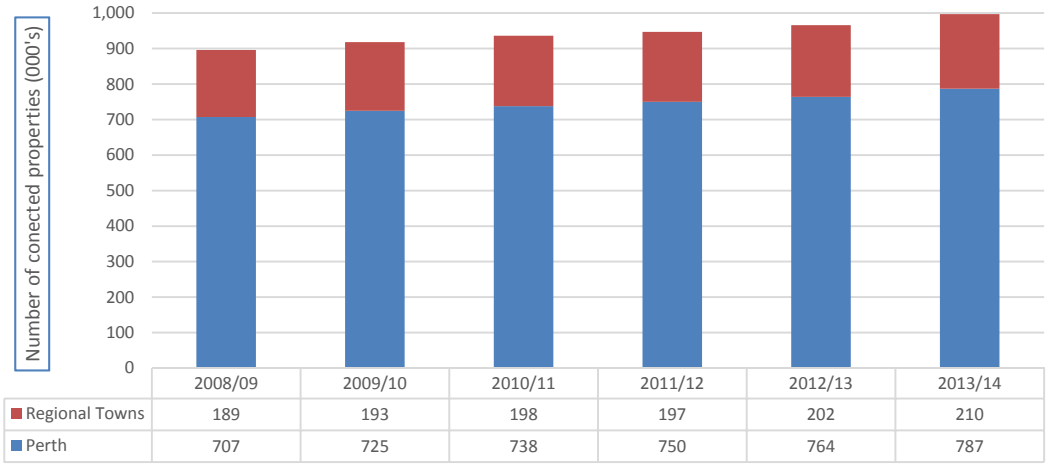
Figure 9 details the number of connected properties over the six years to 2014.

Between 2013 and 2014, the total number of connected properties in the State grew by 3.2%, to reach 997,000 properties. The number of connected properties in Perth and regional towns grew by 3.0% and 4.0%, respectively. Over the past six years, the average annual growth in the number of connected properties in Perth and in regional towns was 2.2% and 1.0% respectively.

[34] It should be noted that the actual figures are still low. In Jurien, the number of main breaks increased from two to eight; in Derby, from four to 12; in Kununurra, from seven to 19; and in Dunsborough-Yallingup from ten to 22.

[35] The number of main breaks in Harvey decreased from eight to four; in Newman from 23 to 13; and in Mandurah, from 53 to 37.

Figure 9: Total connected properties - water supply (000's)



In regional areas, the largest growth in the number of connections occurred in Newman (16.0%), South Hedland (11.1%) and Karratha (9.0%). Only Kalgoorlie-Boulder reported a decrease in the number of connections, which fell by 1.4%.

Customer Service

Water Quality Complaints

Table 5 details the level of water quality complaints for the six years to 2014.

Water quality complaints include any complaint regarding discolouration, taste, odour, stained washing, illness or cloudy water. Because the water supply schemes in the State vary significantly in size, this indicator is normalised to the number of connected properties expressed in thousands (water quality complaints per 1,000 connected properties) to enable comparison across supply schemes of differing sizes.

Table 5: Water quality complaints (per 1,000 customers)

	2009	2010	2011	2012	2013	2014
Perth	6.5	7.9	6.7	6.9	0.1	0.1
Regional Town Average	3.6	3.7	3.9	3.8	0.9	0.1

In 2013, Water Corporation reported a 96.8% reduction in the number of water quality complaints received from customers in the 30 towns (including Perth) that they supply. According to the Water Corporation, this was due to the change in the method of recording complaints.[36]

The ERA will examine Water Corporation's new complaints handling process in the next operational audit of their licence, which will cover the three year period ending 30 June 2015. It is notable that until 2012, Perth consistently recorded the highest level of

[36] Water Corporation provided the following explanation for the large reduction in water and sewerage complaints: "Historically the Corporation always reported a much higher number of complaints than other water utilities. [….] The Corporation was unique in that it automatically recorded all contacts/call on these subjects as a complaint, unless there was evidence to the contrary. [….]Previously [queries regarding malfunctions] were also automatically treated as complaints. When talking with these customers it is apparent that most people are not actually complaining but simply querying why it is happening. When given an explanation and a[n estimated] completion time [….], most customers are satisfied."

water quality complaints nationwide in the major capital cities category of the Urban Framework, but by 2014, Perth recorded the lowest level of complaints in the category nationwide.[37]

Compared to 2013, nearly all of the regional towns supplied by Water Corporation also recorded falls in the number of complaints in 2014. Concurrently, there were significant reductions in complaints recorded by the other two water service providers Aqwest and Busselton Water. Complaints recorded by Aqwest (per 1,000 connected properties) fell from 8.1 to 0.2, while those recorded by Busselton Water fell from 17.8 to 2.0.

In 2014, regional towns recorded a record low average number of water quality complaints (0.1 per 1,000 properties), for the second consecutive year. Busselton recorded the highest number of water quality complaints (2.0 per 1000 properties), followed by Derby (0.5 complaints per 1,000 properties).

Over the past six years, Port Hedland, South Hedland and Newman have recorded the lowest level of complaints. The six year averages for these towns are 0.25, 0.33 and 0.33 complaints per 1,000 connected properties, respectively. Also, Esperance, Jurien and Derby have performed well with six year average scores of 0.42, 0.45 and 0.45 per 1,000 connected properties, respectively.

Water Service Complaints

Water service complaints include all complaints related to bursts, leaks, service interruptions, adequacy of service, water pressure and water reliability. The level of complaints is normalised to the number of connected properties, expressed in thousands (reported as number of complaints per 1,000 connected properties).

Table 6 details the level of water service complaints for the six years to 2014. Since 2012, the level of complaints recorded in both Perth, and regional towns has decreased noticeably. The reasons for the reduction is discussed under water quality complaints above.

Since 2010, the number of complaints recorded for Perth and regional towns has trended downward. In 2014, the water service complaints recorded for Perth remained at the same, record low, level as last year, at 0.3 per 1,000 properties.

Table 6: Water service complaints (per 1,000 customers)

	2009	2010	2011	2012	2013	2014
Perth	24.4	5.8	2.7	0.9	0.3	0.3
Regional Town Average	17.6	4.9	2.4	1.3	0.8	0.1

Average Duration of an Unplanned Water Supply Interruption

An unplanned water supply interruption occurs by definition where the customer has not received at least 24 hours notification of the interruption to supply. The average duration that a customer is without a drinking water supply is a partial indicator of: service quality, the condition of the water network and the standard of network management.

[37] Perth recorded 0.1 complaints per 1,000 connections, compared to a median of 2.1 complaints for the 11 other service providers in the major utility category of the Urban Framework.

Table 7 details the average duration of unplanned interruptions for the six years to 2014.

Table 7: Average duration of an unplanned supply interruption (minutes)

	2009	2010	2011	2012	2013	2014
Perth	141.0	125.4	114.0	118.0	129.7	117.0
Regional Town Average	86.6	78.0	85.4	99.0	84.0	88.4

The average duration of supply interruptions in Perth fell by nearly 10% in 2014, while the regional town average increased by almost 3%, but still remained close to the six-year average of 86.9 minutes.

In 2014, the longest average unplanned interruptions in regional towns were recorded in Harvey/Wokalup (167 minutes), followed by Newman (152 minutes) and Esperance (149 minutes). For the second consecutive year, the shortest average unplanned interruptions was recorded in Busselton (3 minutes), followed by Derby (34 minutes) and Jurien (42 minutes).

Average Frequency of Unplanned Interruptions

The average frequency of unplanned interruptions measures the average number of times the water supply to a customer is interrupted without at least 24 hours' notice.

This is a partial indicator of service quality, reliability and customer satisfaction. Again, this indicator is normalised to the number of connected properties, expressed in thousands (reported as number of interruptions per 1,000 connected properties).

The average frequency of unplanned interruptions in both Perth and regional towns increased significantly in 2014. The increases are due to the data reported by Water Corporation, who explained that the increase was due to, for the first time, including interruptions on the mains to meter connections.[38]

Table 8 shows that the average frequency of unplanned interruptions in Perth more than doubled in 2014, reaching a record high of 286 interruptions per 1,000 connected properties, while the average frequency of interruptions in regional towns increased by 145.3% (from 162.1 to 397.7 per 1,000 connected properties).

Table 8: Average frequency of unplanned supply interruptions

	2009	2010	2011	2012	2013	2014
Perth	67.5	65.6	94.3	104.6	121.7	286.0
Regional Town Average	168.4	124.1	169.8	187.0	162.1	397.7

In 2014, Newman reported the highest frequency of unplanned interruptions (1,734 per 1000 properties), followed by Dongara Denison (1,290.8 per 1,000 properties) and Port Hedland (960.7 per 1,000 properties). The lowest frequency was recorded by Margaret River (96 per 1,000 properties), followed by Mandurah (123.0 per 1,000 properties) and Carnarvon (131.1 per 1,000 properties).

[38] This follows a change in the definition of the indicator in the *2012-13 National Performance Framework: urban performance reporting indicators and definitions handbook.*

Health

Water Quality Compliance

A water supply zone is an area where the water service provider operates. Zone definition is based on a range of criteria, such as an area served by one treatment plant, or an area with clear boundaries (town boundaries etc.).[39] Each water service provider defines their area based on the structure of their supply network.

Table 9 details the number of zones, and the percentage of the population resident in those zones, where the water supply complied with the microbiological and chemical health standards during 2013. All of the 61 zones across the State have achieved 100% compliance with the standards since reporting began in this format in 2009.

Table 9: Zones and percentage population where microbiological compliance was achieved in 2014

	Number of zones where microbiological compliance was achieved	Percentage of population where microbiological compliance was achieved
Perth	24	100
Regional Towns	37	100
All Towns	61	100

[39] A discussion on the criteria used to define a zone can be found on page 89 of the *2012-13 National Performance Framework: urban performance reporting indicators and definitions handbook*, which is available on the National Water Commission website – www.nwc.gov.au

Part B: Sewerage Performance Information

Covered Sewerage Schemes

The report captures sewerage supply schemes with more than 1,000 connected properties, which includes the following 22 towns:

Albany	**Collie**	**Kalgoorlie-Boulder**	**Manjimup**	**Perth**
Australind-Eaton	**Dunsborough**	**Karratha**	**Merredin**	**South Hedland**
Broome	**Esperance**	**Katanning**	**Narrogin**	
Bunbury	**Geraldton**	**Kununurra**	**Newman**	
Busselton	**Jurien**	**Mandurah**	**Northam**	

All of the sewerage schemes are operated by the Water Corporation, with the exception of Kalgoorlie-Boulder, which is operated by the City of Kalgoorlie-Boulder.

For a number of sewerage indicators, data is not available for Newman and occasionally other towns.[40] Where this is the case, average values for the indicators have been calculated by excluding those towns.

Sewage Collected per Property

Sewage collected is defined as the total volume of sewage collected by the utility, measured as treatment plant inflow, plus sewage treated by another business on behalf of the water utility, e.g. a wholesaler.

In 2014, the state-wide total volume of sewage collected rose from 156GL to 162GL (or 3.6%), which is in line with the growth in water consumption. The total volume of sewage collected in Perth increased from 130.7GL to 135.4GL (or 3.6%), while the total volume of sewage collected in regional towns increased from 25.5GL to 26.4GL (or 3.6%).

Table 10 details the annual volume of sewage collected per property for the six years to 2014. Compared to 2013, the annual average sewage collected per property in Perth and regional towns was almost identical: 190kL and 188kL, respectively.

Table 10: Sewage collected per property (kL)

	2009	2010	2011	2012	2013	2014
Perth	191	189	182	189	187	190
Regional Town Average	192	185	176	193	185	188

In the regional towns, the volume of sewage collected correlates well with the volume of residential water supplied. The towns in the warmer northern areas of the State consume more water and produce higher volumes of sewage, while the reverse applies in towns in the cooler southern areas of the State. Compared to 2013, the largest increases in the total collected sewage volumes were recorded in Northam (22.6%), Jurien (20.0%) and Manjimup (17.9%).

[40] The Newman sewerage reticulation network is operated by Water Corporation, but the sewage treatment plant is operated by the Shire of East Pilbara.

Recycled Water (% of Effluent Recycled)

This indicator measures the percentage of treated sewage (effluent) that is used to produce recycled water. Recycled water can be used, for example, to irrigate the town's parks and ovals; or for agricultural, industrial or commercial uses.

Table 11 details the percentage of effluent that was used to produce recycled water for the six years to 2014. Compared to 2013, the percentage of recycled effluent in Perth fell, while the average percentage of effluent reused in regional towns rose, continuing the long term growth in the use of recycled effluent in regional areas. The average percentage of water supplied from recycled effluent in regional towns has steadily grown since 2009.

Table 11: Recycled water - percentage of effluent recycled

	2009	2010	2011	2012	2013	2014
Perth	6.2	6.1	7.4	8.0	7.9	7.4
Regional Town Average	47.6	48.6	48.7	48.4	54.1	54.5

The underlying data shows that the six towns that recycled 100% of their effluent in 2013 continued to do so in 2014: Albany, Australind/Eaton, Broome, Dunsborough, Kununurra and Merredin, closely followed by South Hedland, with 90.9%.

Northam registered the largest increase in the percentage of effluent recycled in 2014, (up from 32% to 66%). In contrast, Collie and Jurien have not recycled any effluent since reporting began in 2009, while Bunbury, Mandurah and Perth recycle less than 10% of their effluent.

Asset Data

Length of Sewerage Mains and Channels (km)

Sewer mains include all trunk, pressure and reticulation mains.

Table 12 details the length of the sewer main and channel network for the six years to 2014. In 2014, the total length of sewerage mains and channels Perth increased by a further 1.7%, while in regional towns the total length of mains increased by 3.9%. The increase in mains in both Perth and regional towns continues the growth trend of the past six years.[41] Since 2009, the average annual growth in the length of sewer mains in both Perth and regional towns has been just over 1.0%, respectively.

Table 12: Length of sewer mains and channels (km)

	2009	2010	2011	2012	2013	2014	% change
Perth	10,886	11,007	11,198	11,271	11,443	11,637	1.7%
Regional Towns	3,176	3,204	3,265	3,359	3,336	3,467	3.9%
Total	14,062	14,211	14,463	14,630	14,779	15,104	2.2%

[41] The decrease in the length of mains in regional towns in 2013 was attributed to the reclassification of sewer mains, and a review of town boundaries for the 21 supply schemes operated by Water Corporation.

Properties served per km of Sewer Main

The purpose of this indicator is to report on the spatial density of properties served by sewerage mains.

Table 13 details the properties served per km of sewer main for the five years to 2013.

During 2014, the number of properties served per km of sewer main in Perth and in the regional towns remained unchanged (at 61 and 43 properties per km of sewer main, respectively). Some of the individual regional towns have seen small changes in spatial density because of the decrease in the total length of sewer mains (due to reclassification and town boundary adjustments, which was discussed in the previous section).

Table 13: Properties served per km of sewer main[42]

	2009	2010	2011	2012	2013	2014	% change
Perth	59	60	60	61	61	61	0.0%
Regional Town Average	43	44	45	41	43	43	0.0%

Of the regional towns, Kalgoorlie-Boulder, Newman and Karratha recorded the highest density with 72 properties, 60 properties and 53 properties per km of sewerage main, respectively. Conversely, Jurien, Manjimup and Esperance recorded the lowest spatial densities, with 22 properties, 34 properties and 35 properties per km of sewer main.

Sewer Main Breaks and Chokes

The purpose of this indicator is to report on the number of sewer main breaks and chokes in the sewerage system. A choke is defined as a confirmed partial or total blockage that may or may not result in a spill from the sewer system to the external environment. Breaks and chokes is a partial indicator of customer service and the condition of the sewerage network. Table 14 shows sewer main breaks and chokes during the five years to 2014.

Table 14: Sewer main breaks and chokes (per 100km of main)

	2010	2011	2012	2013	2014	% change
Perth	22.2	19.3	18.6	16.1	17.0	5.6%
Regional Town Average	25.5	27.4	24.9	24.6	24.2	-1.6%

Comparing 2014 with 2013, the level of breaks and chokes in Perth rose slightly, but remained below the five-year average (18.6 per 100km of main), and the level of breaks and chokes in regional towns remained almost unchanged.

In 2014, Narrogin, Northam and Katanning recorded the highest levels of breaks and chokes with 81.8, 64.2 and 61.9 per 100km of main, respectively. In contrast, Busselton, Jurien, Australind/Eaton, Geraldton and Dunsborough all achieved a breaks and chokes performance of below 10.0 per 100km of sewer main.

[42] The apparent growth in regional town property connections was caused by a rounding error in 2010 and 2011.

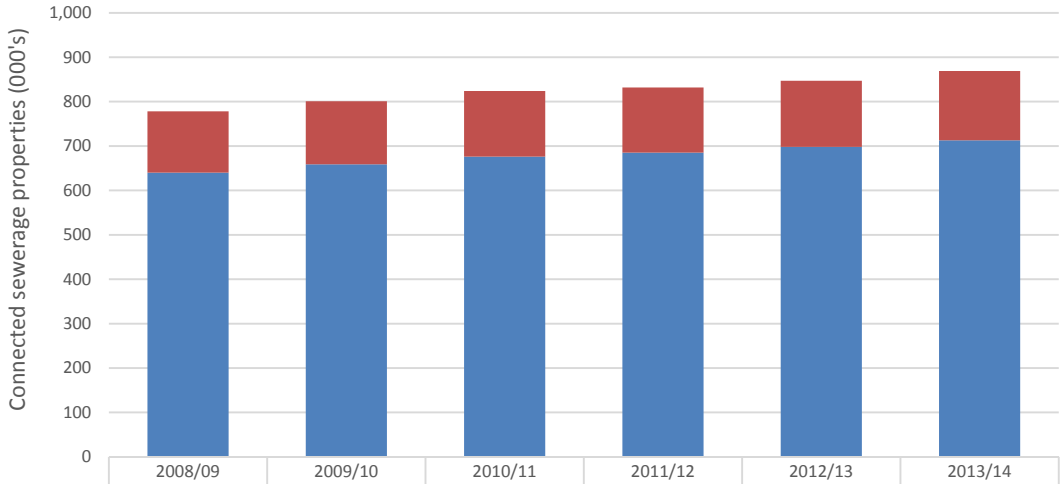
Customers

Total Connected Properties – Sewerage

Figure 10 details the number of sewerage connected properties for the six years to 2014.

Between 2013 and 2014, the number of connected properties in Perth rose by 2.1%, and in regional towns connected properties rose by 4.7%. Over the six years to 2014, the average annual growth in connected properties in Perth was 1.7%, and in regional towns growth was just over 1.0% per annum.

Figure 10: Total connected properties - sewerage (000's)



	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Regional Towns	138	142	148	147	149	156
Perth	640	659	676	685	698	713

In 2014, six out of 22 regional towns had over 10,000 connected properties: Albany, Bunbury/Dalyellup, Busselton, Geraldton, Kalgoorlie-Boulder and Mandurah.[43] The next largest regional towns are Australind/Eaton (with approximately 9,000 connections) and Karratha (with approximately 7,800 connections). The smallest sewerage schemes (<2,000 connections) are: Jurien (700 connections), Katanning (1,600 connections), Kununurra (1,900 connections), Manjimup (1,700 connections), Merredin (1,400 connections) and Narrogin (1,900 connections).

Sewerage Service Complaints

Table 15 details the level of sewerage service complaints, expressed as a normalised figure per 1,000 properties, for 2009-2014. The purpose of this indicator is to report customer satisfaction with sewerage services and provide a partial indicator of service quality and reliability.

Sewerage service complaints include all complaints concerning sewer blockages and spills, trade waste services, sewerage system reliability, sewage odours and all other sewerage issues.

[43] Towns with over 10,000 connected properties are covered by the NWI Urban Framework.

Table 15: Sewerage service complaints (per 1,000 properties)

	2009	2010	2011	2012	2013	2014
Perth	6.2	2.1	1.4	0.4	0.2	0.1
Regional Town Average	7.5	2.7	2.4	1.2	0.6	0.3

The level of sewerage service complaints in Perth, and in the regional towns on average have continued the long-term downward trend. Since 2009, the level of complaints in Perth has fallen to a new record low, down from 6.2 to 0.1 per 1,000 properties, while in regional towns the average level of complaints has also reached a record low, down from 7.5 to 0.3 per 1,000 properties.

In 2014, all regional towns except Kalgoorlie-Boulder (4.2 per 1,000 properties), Geraldton (0.7 per 1,000 properties) and Northam (0.3 per 1,000 properties) recorded less than 0.1 sewerage service complaints per 1,000 properties.

All except one of the 22 sewerage schemes are operated by Water Corporation. The reduction in the number of water service complaints received by the Water Corporation is discussed on pages 15-16 under water quality complaints. As mentioned earlier in this report, the ERA will be examining the Water Corporation's new complaints handling processes in the next operational audit, which covers the three year period ending 30 June 2015.

Environment

Percent of Sewage Treated Volume Compliant

The purpose of this indicator is to demonstrate the water utility's ongoing compliance with environmental standards applying to the environment into which the treated effluent is discharged. The compliance percentage is calculated by taking the number of scheduled samples of the treated effluent that complied with the applicable environmental standards and dividing it by the total number of scheduled samples of the reporting year.

In 2014, the following 17 towns achieved 100% compliance:[44]

Albany	**Perth**	**Jurien**	**Narrogin**
Bunbury / Dalyellup	**Broome**	**Katanning**	**South Hedland**
Busselton	**Collie**	**Kununurra**	**Mandurah**
Geraldton	**Dunsborough**	**Manjimup**	**Esperance**
			Merredin

The remaining four towns had a compliance percentage lower than 100%: Australind-Eaton (42%), Kalgoorlie-Boulder (42%), Karratha (48%) and Northam (67%).

Water Corporation advised the ERA that where non-compliances occurred, they were mainly due to exceedances in nutrient parameter targets. In Karratha, overflows occurred in plant No. 2 due to pump failures, blockages and leakages; Water Corporation expects this to be mitigated when the upgrade to Karratha plant No. 1 is completed.

The City of Kalgoorlie-Boulder advised the ERA that it has identified, as a primary cause of non-compliances, high levels of industrial waste disposal to sewer system.

[44] Data is not available for Newman.

Number of Sewage Treatment Plants Compliant at All Times

The purpose of this indicator is to report on the number of sewage treatment plants that were compliant with the environmental licence conditions covering the discharge of effluent into the environment at all times during the reporting year. This gives an indication of the overall performance of the utility's sewage treatment and, if problems exist, whether they are localised or more widespread.

In 2014, 31 of the 38 monitored sewerage treatment plants were compliant at all times. The exceptions were: Australind/Eaton, Kalgoorlie-Boulder, Collie, Manjimup, Karratha (1 out of 3 plants), Northam and South Hedland. These seven towns did not achieve full compliance mainly because they did not always meet the effluent quality standards set in the licence.[45] Three of the five non-compliant towns (Australind/Eaton, Kalgoorlie-Boulder and Karratha) have not achieved full compliance with the standards for three years.

Comparative Sewage Treatment Levels

The purpose of these indicators is to report on the degree to which sewage is treated. This is an important cost driver for a water utility, both in terms of both capital costs and operating costs: higher level treatment processes are more expensive than lower level processes. [46]

Table 16 provides a breakdown of the all town average of percentage of sewage that was treated to a primary, secondary or tertiary level in 2014. In Perth, 95% of the effluent is treated to tertiary level and the remaining 5% to primary level.

Five out of 21 regional towns treat all of their effluent to tertiary, recyclable, level: Albany, Australind/Eaton, Bunbury/Dalyellup, Busselton and Mandurah. The remaining 16 towns treat all of their effluent to secondary level.

Table 16: Percentage of sewage treated by treatment level (all towns)

	2010	2011	2012	2013	2014
Primary Treatment	4.0%	4.2%	4.2%	4.3%	4.2%
Secondary Treatment	7.1%	7.3%	7.4%	7.3%	7.1%
Tertiary Treatment	88.9%	88.5%	88.4%	88.5%	87.8%

Sewer Overflows Reported to the Environmental Regulator

This indicator is about sewer overflows that may adversely impact on water quality, human health and ecosystem stability (if they occur in sensitive areas). The number of overflows indicates the condition and standard of operation of the sewerage network.

Table 17 details the number of sewer overflows (per 100km of sewer main) that have been reported to the environmental regulator in 2009-2014. The data varies quite widely each year, which suggests that the root cause of the overflows is most likely adverse weather events (such as storms or flooding) rather than sewer infrastructure maintenance issues.

[45] In addition, in some instances, suitable devices for measuring the cumulative volumes of treated effluent had not been maintained.

[46] Primary treatment removes suspended matter by settling it at the bottom of the tank; secondary micro-organism treatment removes up to 85% of dissolved and suspended biological matter; and tertiary treatment disinfects and removes also nutrients. More information on *2012 – 13 National Performance Framework: Urban performance reporting indicators and definitions handbook* at nwc.gov.au.

Table 17: Sewer overflows reported to the environmental regulator (per 100km of sewer main)

	2009	2010	2011	2012	2013	2014
Perth	0.2	1.1	0.2	0.1	0.2	0.2
Regional Town Average	20.4	10.4	25.3	11.3	16.2	4.5

The Water Corporation advised that sewer overflows reported to the environmental regulator were notably higher compared with previous years for Karratha WWTP No.2 (attributed mainly to pump failures, blockages and leakages) and Northam (attributed mainly to high rainfall events and blockages). For South Hedland, sample points and parameters relating to the South Hedland WWTP environmental licence do not accurately reflect the quality of the treated wastewater discharged. Water Corporation and the environmental regulator are currently working to resolve these matters.

PART C: COMBINED WATER AND WASTE WATER PERFORMANCE INFORMATION

Performance Data Format

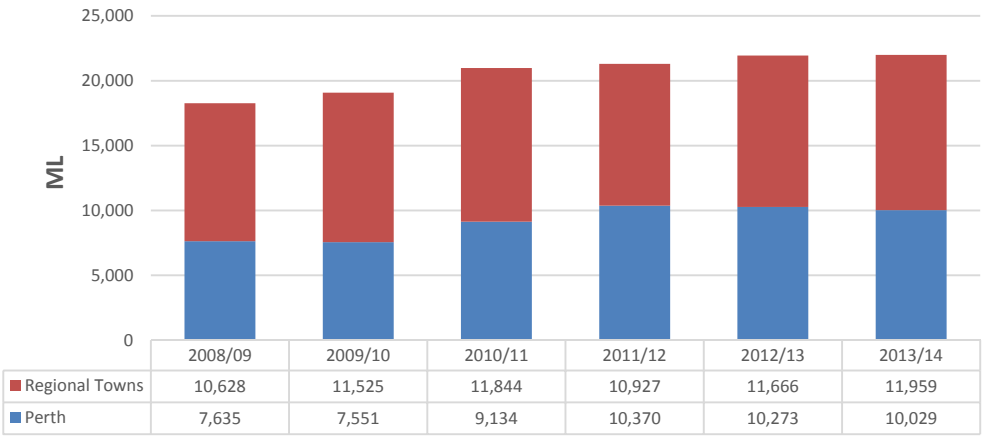
This part of the report presents the performance data of the combined water and sewerage service providers.[47] The performance data for all the towns/schemes in this section has been provided in a format consistent with the National Water Commission's Urban Framework for water delivery and sewerage providers.

Total Recycled Water Supplied

Total recycled water supplied is the sum of all treated effluent that is used by either the water utility itself or supplied to another business; or supplied for urban reuse. The volume of recycled water supplied is an indirect measure of the volume of potable or non-potable water saved (that might have been consumed had recycled water not been available).

Figure 11 details the volume of recycled water supplied in Perth and the regional town average volume supplied between 2009 and 2014. In 2014, the total volume of recycled water supplied across the State grew by a modest 0.2%, to 22GL. The growth in total volume was the net result of a 2.5% increase in water supplied in regional towns and a 2.4% decline in the volume of recycled water supplied in Perth.

Figure 11: Total recycled water supplied (ML)



	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Regional Towns	10,628	11,525	11,844	10,927	11,666	11,959
Perth	7,635	7,551	9,134	10,370	10,273	10,029

Figure 13 details a breakdown of the uses of recycled water in 2014. The largest user of recycled water was the commercial, municipal and industrial sector (52.8%) followed by agricultural users (up to 23.4% from 19.3% in 2013) and onsite reuse[48] (12.6%).

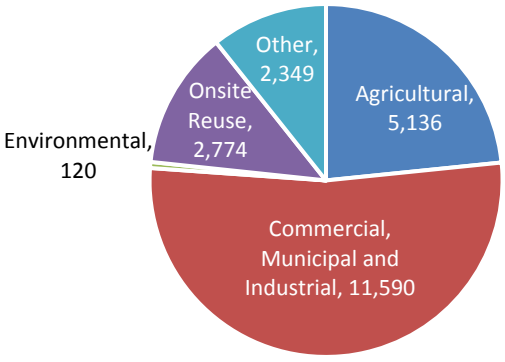


Figure 12: Uses of recycled water in 2014 (ML)

[47] The data presented here is for 35 water and sewerage schemes that supply recycled water in the State. In some towns the water and sewerage services are provided by separate utilities.

[48] Onsite reuse is where the water is used for processes within the sewage treatment plant.

Total Water and Sewerage Complaints

This indicator reports on customer satisfaction with water and sewerage services and on service quality and reliability. The level of complaints is normalised to the number of connected properties, expressed in thousands. The data presented here is for 35 towns that have their water and sewerage service provided by the same utility.

Table 18 presents the combined water and sewerage complaints for the six years to 2014.

Between 2013 and 2014, there was a slight rise in the number of complaints per 1,000 connected properties (up from 0.6 to 1.0 per 1,000 properties) in Perth, and a slight decrease (from 1.0 to 0.9 per 1,000 connected properties) in regional towns.

Water Corporation commented to the ERA that the increase in complaints in Perth is partly attributable to the 8% increase in 2013-14 in the overall level of customer contacts regarding water and sewerage faults; whereas the decrease in the regional complaints relates to the 25% decrease in customer contacts regarding water quality issues.

Table 18: Total water and sewerage complaints (per 1,000 connected properties)

	2009	2010	2011	2012	2013	2014
Perth	38.0	16.8	12.1	9.5	0.6	1.0
Regional Town Average	25.2	11.9	8.1	6.3	1.0	0.9

Northam recorded the highest level of complaints (2.3 complaints per 1,000 connected properties), while seven towns received less than 1.0 complaint per 1,000 properties. The reasons for the significant decline in complaints received between 2011 and 2014 is discussed earlier in this report in the sections dealing with water complaints and sewerage complaints.

Billing and Account Complaints – Water and Sewerage

The purpose of this indicator is to report on the level of billing and account complaints received for the utility's water supply and sewerage services.[49] A billing and account complaint includes all complaints relating to account payment, financial loss or overcharging, billing errors and affordability.

Complaints regarding government pricing policy, tariff structures or when a correctly calculated bill is queried are excluded. The level of complaints is normalised to the number of connected properties, expressed in thousands.

Table 19 presents the number of billing and account complaints received between 2009 and 2014. Compared to 2013, the number of billing and account complaints in Perth and regional towns, on average, both rose during 2014. According to the Water Corporation, the increase in billing and account complaints in 2014 was mainly attributable to the change from annual billing to bi-monthly billing.

For the second consecutive year, the highest number of billing and account complaints was recorded in Dongara/Denison (2.3 complaints per 1,000 properties). There were seven

[49] The data presented here is for a total of 35 water and sewerage schemes. In some towns the water and sewerage services are provided by separate utilities.

towns that recorded zero billing and account complaints and, of the remaining 28 towns, only six recorded more than 1.0 complaint per 1,000 properties.

Table 19: Billing and account complaints - water and sewerage (per 1,000 connected properties)

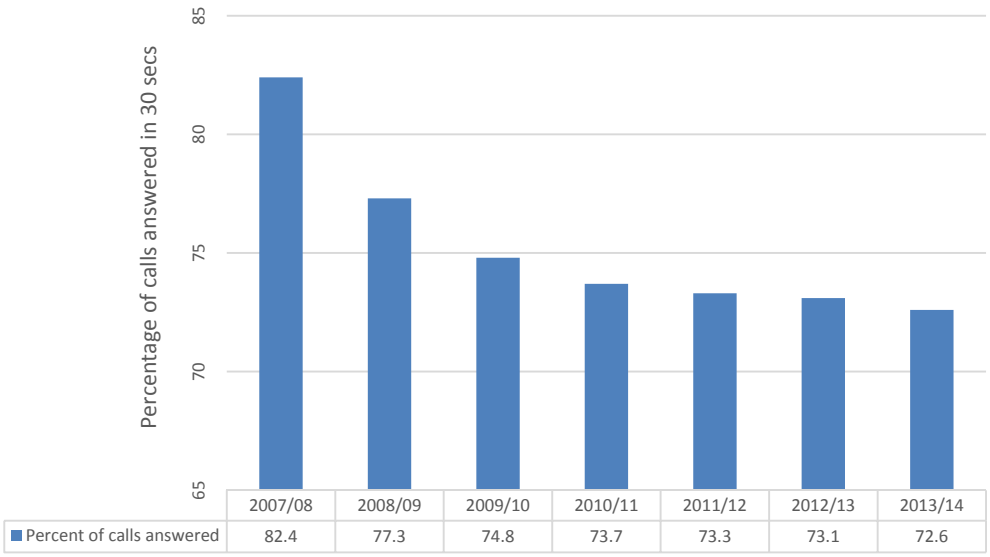
	2009	2010	2011	2012	2013	2014
Perth	1.2	1.2	1.4	1.4	0.2	1.0
Regional Town Average	1.0	1.3	1.4	1.0	0.2	0.6

Connect Time to a Call Centre Operator

The purpose of this indicator is to report on the proportion of calls that are answered by an operator within 30 seconds, where the customer has selected an option to speak with an operator.[50] The Water Corporation is the only water service provider that operates a state-wide customer call centre, covering both water and sewerage enquiries.

Figure 13 details the proportion of customer calls that were answered within 30 seconds between 2008 and 2014. In 2014, 72.6% of telephone calls to a Water Corporation operator were answered within 30 seconds, a six year low. The percentage of calls answered within 30 seconds has declined during the monitoring period, but it has remained in the range of 72-75% for the past five years.

Figure 13: Percentage of Water Corporation calls answered within 30 seconds



[50] Utilities that operate a call centre capable of automatically recording operator responsiveness must report on this indicator. Utilities that have other telephone systems to handle customer calls may report this indicator on a voluntary basis.

PART D: IRRIGATION PERFORMANCE INFORMATION

Irrigator performance data included in this report

This report continues the ERA's coverage of the performance of Western Australian irrigators. The two irrigators covered by this report are:

- Ord Irrigation Cooperative Ltd (Ord Irrigation); and
- South West Irrigation Management Cooperative (Harvey Water).

There are another two irrigators licensed by the ERA (Gascoyne Water Cooperative (**GWC**) and Preston Valley Irrigation Cooperative (**PVIC**)), but they are excluded from the report based on their smaller customer base. Instead, GWC and PVIC provide to the ERA a limited subset of the performance information that Ord Irrigation and Harvey Water are required to provide. This makes it difficult to meaningfully compare the performance of the two pairs of irrigators.

The data for Ord Irrigation and Harvey Water is derived from the annual performance reports provided to the ERA, which are based on the, now defunct, Rural Framework (refer to the discussion in the section entitled "Performance Reporting Obligations").

Volume of Water Supplied

Table 20 details the total volume of water supplied for irrigation purposes between 2009 and 2014.

For the first time in four years, the volume of water supplied by Harvey Water increased, up by 34.7% between 2013 and 2014. The fall in the supply in previous years was caused by dry weather conditions, which resulted in reductions in Harvey Water's water allocations, as well as contraction in the local dairy industry.[51]

The volume of water supplied by Ord Irrigation continued to fall for the second consecutive year. The volume of water supplied by Ord Irrigation has fallen by 33.8% since 2009. The decline in water supplied reflects a fall in demand for irrigation water, rather than restrictions on the volume of water available.

Table 20: volume of water supplied for irrigation (ML)

	2009	2010	2011	2012	2013	2014	% change
Harvey Water	68,122	69,038	59,876	46,096	41,807	56,310	34.7%
Ord Irrigation Cooperative	144,649	114,049	117,369	118,816	100,637	95,772	-4.8%
Total	212,771	183,087	177,245	164,912	142,444	152,082	6.8%

Customer service points

The method of measuring customer connections on irrigation networks under the Rural Framework was completely redefined in 2011. Up until 2011, irrigators reported the separate values for the number of irrigation connections and non-potable water connections on their supply networks. This has now been replaced by a single indicator measuring the total number of customer service points on the network. As a result of these changes to

[51] *National Performance Report 2012-13: rural water service providers*, page 158, which is available on the National Water Commission website – www.nwc.gov.au

the reporting of customer service points, the historical data for 2009 and 2010 has been restated to comply with the revised definition of customer service point.

Table 21 presents the number of customer service points on the two supply networks between 2009 and 2014. The number of customer service points for both Harvey Water and Ord Irrigation networks has remained relatively unchanged between 2013 and 2014.

Table 21: Number of customer service points on irrigation networks

	2009	2010	2011	2012	2013	2014	% change
Harvey Water	1,684	1,698	1,744	1,760	1,751	1,759	0.5%
Ord Irrigation Cooperative	268	286	283	270	271	269	-0.7%
Total	1,952	1,984	2,027	2,030	2,022	2,038	0.3%

Carrier Length (Gravity Irrigation)

Table 22 details the length of the pipes and channels in the gravity irrigation networks operated by Harvey Water and Ord Irrigation.

The Ord Irrigation network is entirely made up from unlined channel, whereas the Harvey Water network has a mix of lined and unlined channels and pipe. The network channel length on both the Harvey Water and Ord Irrigation networks has remained almost unchanged since 2012.

Table 22: Carrier length - gravity irrigation networks in 2014 (km)

	Unlined Channel	Lined Channel	Pipe	Total Carrier Length
Harvey Water	171	85	495	**771**
Ord Irrigation Cooperative	125	0	0	**125**
Total	296	85	495	**876**

Complaints

Table 23 details the complaints received by Ord Irrigation and Harvey Water during the six years to 2014. During the six years, the number of complaints received by both irrigators has been quite small. All of the complaints relate to customer service issues rather than billing and account issues.

In 2014, Ord Irrigation received two complaints, while Harvey Water, for the fourth consecutive year, did not receive any complaints.

Table 23: Customer service delivery complaints

	2009	2010	2011	2012	2013	2014
Harvey Water	4	3	0	0	0	0
Ord Irrigation Cooperative	5	4	2	0	3	2