Draft Submission by Shoalhaven City Council
Inquiry into the Augmentation of Water Supply for Rural and Regional New South Wales

Background – Shoalhaven Water

Shoalhaven City Council has responsibility for water and sewerage services for the Shoalhaven Local Government area. The Local Government area includes 49 towns and villages, scattered predominantly along the coast.

Council exercises water supply and sewerage functions under Division 2 Part 3 Chapter 6 Local Government Act 1993 and therefore acts as a "Local Water Utility" (LWU) in addition to its other local government functions. Council meets these responsibilities and delivers water and sewerage services through Shoalhaven Water, a defined Business Group of Council.

Shoalhaven Water supplies potable water and reclaimed water to a variety of customers in the LGA. It operates a number of water storages and is also reliant on storages owned and operated by WaterNSW (formerly the Sydney Catchment Authority).

About 90% of the LGA's raw water is pumped from the Shoalhaven River at Burrier approximately 47 km upstream of the ocean estuary outlet. The water is pumped from Burrier to a 3,800 megalitre off river storage dam at Bamarang near Nowra West. The water is then pumped from the dam to Water Treatment Plants at Bamarang and Flatrock. The treated water is then transferred throughout the City.

Some parts of the southern Shoalhaven area are normally served by the Porters Creek Dam west of Milton which supplies the Milton Water Treatment Plant. The plant treats water for the Milton/Ulladulla/Narrawallee/Mollymook/Kings Point/Burrill Lake/Lake Tabourie areas. Bendalong, Manyana, Conjola & Fisherman's Paradise are supplied from the Northern System, which also supplements the area served by the Milton Water Treatment Plant over peak demand holiday periods or when the operating level in the Porters Creek dam is low.

A fourth treatment plant is located in Kangaroo Valley at Bendeela Pondage and supplies water to the Kangaroo Valley township. This plant is a microfiltration plant and operates using a membrane system.

A 7,600 megalitre storage dam at Danjera acts as an emergency backup supply feed for the Shoalhaven River in times of drought. The combination of Danjera's 7,600 megalitres and the off river Bamarang 3,800 megalitres storage acts to limit the effect of low flows in the Shoalhaven River to provide drought security for the Shoalhaven City water supply system.

The flow in the lower Shoalhaven River is controlled from Tallowa Dam, owned and operated by WaterNSW. Release of water from Tallowa Dam for Shoalhaven use is controlled through a series of agreed protocols between WaterNSW and Shoalhaven Water.

Flows from the Shoalhaven can also be used to supplement Sydney's water supply during a drought. This is achieved by pumping water from Tallowa Dam to Wingecarribee Reservoir in the Southern Highlands. From there it is released and flows down the Wollondilly River to Sydney's Warragamba Dam, or the Nepean River to Nepean and Avon dams, which supply the people of the Illawarra with water.

Rules for environmental flow releases from Tallowa Dam to the lower Shoalhaven River have been implemented by the State Government through the Greater Metropolitan Water Sharing Plan, which came into force on the 1st July 2011.

Shoalhaven Council is the owner of 4 prescribed dams – Bamarang, Cambewarra, Danjera and Porters Creek. Council also supplies reclaimed water to dairy farms and sporting facilities from its 600ML reclaimed water storage at Callalla sewage treatment plant.

Response to Terms Of Reference

Given the possible breadth of the Terms of Reference to this Inquiry, Shoalhaven Council determined to focus on 2 critical aspects of the ToR relevant to the Shoalhaven (items a) and b) of the ToR).

a) Investigate the requirement for a water equation (demand and supply out to the middle of this century) for rural and regional New South Wales

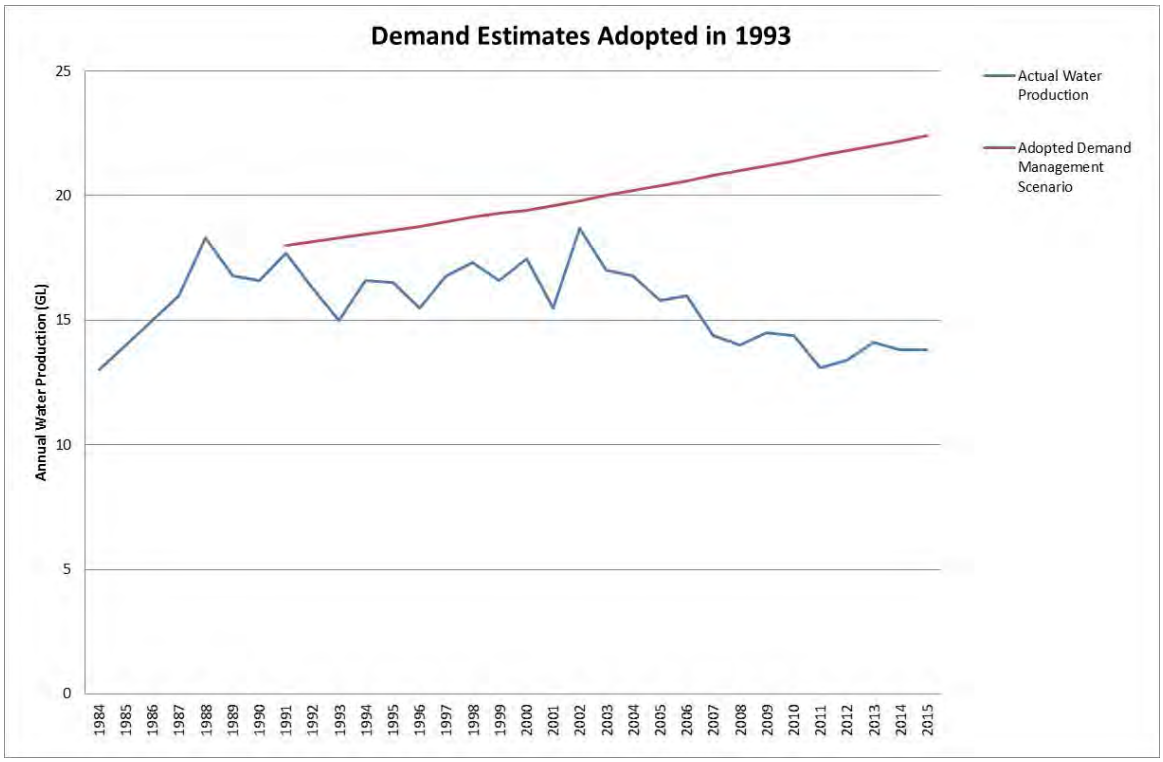
Shoalhaven City Council has been proactive for many years in planning for the security of water supply for the Shoalhaven Local Government Area. Council had negotiated and lobbied the New South Wales State Government for 4 years to provide sustainable outcomes for the Shoalhaven River system. An agreement was finally reached in 2006 that secured water licence entitlements for the Shoalhaven City and provided for positive environmental outcomes.

The mechanisms for Shoalhaven's water security are embedded in Council's extraction licence, the Bulk Water Supply Agreement and the Bulk Water Supply Protocols. The Bulk

Water Supply Protocols are also legislated within the Water Sharing Plan for the Greater Metropolitan Region – Unregulated River Water Sources 2011.

These mechanisms, combined with effective demand management processes have meant that the existing storages within the Shoalhaven system have adequate capacity to meet the demands of the end users.

The graph below shows the actual water demand as the projected demand adopted in 1993 when additional sources of water were being considered.



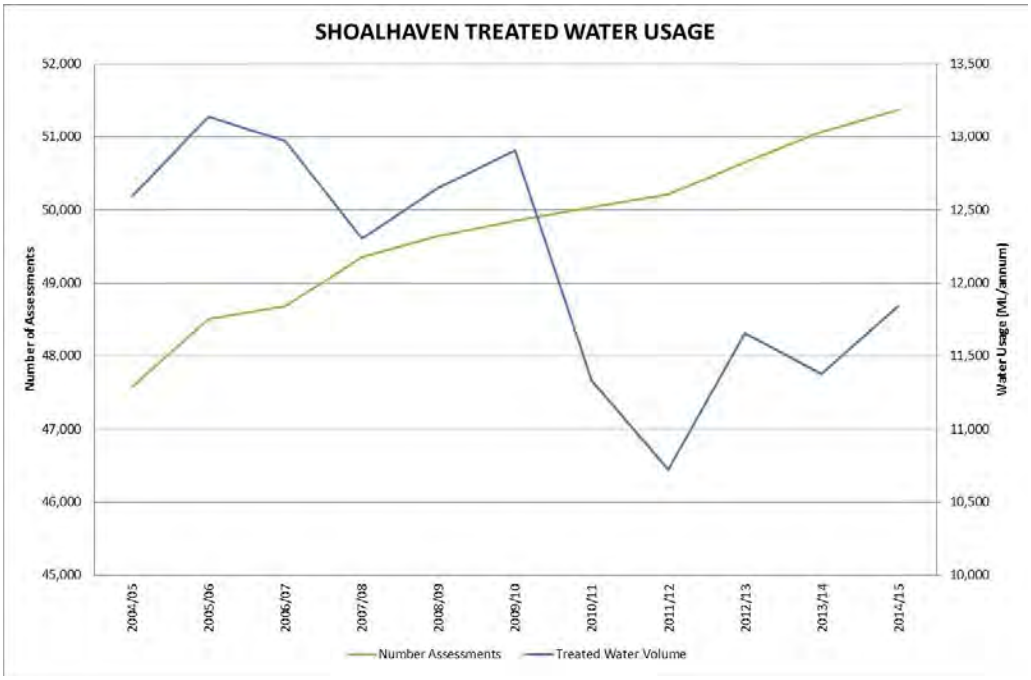
Clearly since the total system demand is at levels equivalent to the mid 1980s, the previous headworks proposals have not been required.

Reductions in total demands have been achieved despite increases in the number of properties connected to the system, as shown in the graph below.

As part of DPI Water's Best Practice Management Shoalhaven Water prepared an Integrated Water Cycle Management (IWCM) Strategy. The strategy identified the preferred options for development of urban water services (water supply, wastewater and stormwater) at Shoalhaven City.
The process taken to develop the IWCM Strategy included:

Consideration of the Concept Study findings and baseline forecasts.

- Development of the long-list of options and assessment criteria for decision making.
- Selection of options for further assessment.
- Detailed options assessment and development of IWCM scenarios.
- Identification of the preferred scenario.



The integrated scenarios incorporate combinations of various demand management measures and an increasing movement towards the integration of water supply, sewerage treatment and stormwater management through cumulative inclusion of rainwater, stormwater, greywater and reclaimed water use. The supply side approach is common to all scenarios, drawing on surface water extractions from the Shoalhaven River, Danjera Creek and Porters Creek, with system capacity requirements sized to suit the town water demands for each scenario.

Council formally adopted its Integrated Water Cycle Management Strategy in June 2008. The focus of Shoalhaven water supply planning is now directed at enhancing the north-south system transfer capacity.

It is therefore considered that appropriate planning has been carried out for the Shoalhaven water supply system. The current protocols as established with the previous

Sydney Catchment Authority are appropriate and provide effective mechanisms to maintain the security of Shoalhaven City Council's Water Supply.

b) Examine the suitability of existing NSW water storages and any future schemes for augmentation of water supply for NSW

There remains outstanding land tenure by WaterNSW previously acquired for a proposed Welcome Reef Dam on the upper reaches of the Shoalhaven River.

The Welcome Reef Dam project has had a long history.

The Snowy Mountains Engineering Corporation prepared an Environmental Impact Report in 1980 for the (then) Metropolitan Water Sewerage and Drainage Board (the Board). The Welcome Reef project had included a dam on the Shoalhaven River about 70km to the east of Canberra and 30km north of Braidwood. The stated purpose of the dam was to supplement the Shoalhaven transfer scheme to meet increased demand from Sydney.

In 1985 the Board advised Shoalhaven Council that they intended to proceed with the Welcome Reef Dam project, but had deferred the project and it had a tentative completion date of 1999.

Further advice to Council in 1991 put the dam construction commencement as 2002. In 1992 a series of public information sessions were held throughout the affected regions.

At the Council meeting of 23 March 2004, Shoalhaven Council resolved to "reject the proposal to resurrect the Welcome Reef Dam concept."

It is clear from the key strategic water planning documents for Sydney that a new dam on the Shoalhaven River is not required nor is it on a planning agenda from a technical perspective. The following excerpts from the 2004, 2006 and 2010 Metropolitan Water Plans demonstrate this:-

2004 Metropolitan Water Plan

> ***"There is no need for a twelfth dam. Another dam would be very costly from a financial and environmental perspective with an estimated cost of over $2,000 million for Welcome Reef Dam. The same dam would be very shallow with a large surface area, meaning that evaporation rates would be extremely high and increase the potential for toxic blue-green algae outbreaks. It would take nearly 10 years to build and fill under average conditions and up to 30 years if current drought conditions continue. A new dam would not make the most of the existing infrastructure and so it is far more effective to extend our current system as proposed in this Plan."***

2006 Metropolitan Water Plan

"The current Shoalhaven Scheme comprises Tallowa Dam and a system of pumps, pipes and reservoirs which were completed in 1976. The scheme was planned as the first phase of a much larger but now abandoned project (the Welcome Reef Dam) for the specific purpose of capturing water from the headwaters of the Shoalhaven River and transferring it to Sydney to boost supplies when the Sydney storage system fell to low levels."

2010 Metropolitan Water Plan

"After extensive research, analysis and community consultation important improvements to the Shoalhaven system were announced in March 2007.

These included:

- ***New environmental flow rules for the lower Shoalhaven River (see page 50)***
- ***Changed operation of Tallowa Dam:***
  - ***Water transfers will begin when Sydney's total dam storage level falls to around 75 percent and continue until total dam storage level rises above 80 percent***
  - ***Water will not be drawn down further than one metre from Tallowa Dam's full storage level – this will be increased to three metres in times of severe drought (see page 56)***
- ***New infrastructure at Tallowa Dam to allow native fish passage and improve the quantity and quality of water releases downstream for the environment (see case study on this page)***
- ***Upgraded picnic facilities at the dam site.***

The Shoalhaven and Wingecarribee communities were also invited to comment on six options to upgrade the water supply transfer system. The options looked at ways to transfer more water from Tallowa Dam to Sydney and the Illawarra, if required in the future. Several options had

the benefit of protecting the health of the Southern Highlands' river system by reducing the use of rivers to transfer water between dams.

Based on community feedback, scientific and engineering investigations, and social, economic and cultural heritage assessments, three options were short listed. Further detailed technical investigations of these options have been undertaken. The preferred augmentation option is a tunnel from Burrawang to Avon Dam.

There are significant costs and lead times for the augmentation and a decision on its timing will depend on factors such as future climate predictions and population growth and demand. These factors will be reviewed over the next few years with a view to having an upgraded system built and operational by around 2025."

Shoalhaven Council therefore submits in the strongest terms that the Inquiry should reject any proposal to resurrect the Welcome Reef Dam project and the Inquiry should find that the land acquired for that purpose is no longer required.

WSAA National Customer Perceptions Survey

Executive Summary

Customer focus is a top priority for Australian water utilities. This means ensuring customer needs and preferences are considered as part of investment decisions, performance indicators and planning for the future. At the heart of this is an understanding of what drives customer value, trust, customer behaviours and the expectations they have for their water utility. In August 2015, the Water Services Association of Australia (WSAA) along with Insync carried out an Australia-wide survey of 5973 customers from 21 water utilities. This survey provided excellent insight into what influences customer value and trust and identified the leading performers among the utilities. The survey also highlighted areas of improvement and will guide a collaborative work program among the utilities on customer indicators, engagement and value.

Key Insights from the Survey

- Value for money, trust and satisfaction with the quality of the drinking water is higher when respondents know that their water utility manages their sewerage services. Improving brand awareness and knowledge of the sewerage services will improve how customers rate the utility.
- Contrary to data collected by the utilities, the respondents who have contacted the utility in the last 12 months only score their utility higher if they are from regional areas. This effect was not demonstrated for most of the urban utilities. There may be some crucial differences in the survey method or context compared to the utility surveys.
- Too much information is better than not enough. The 25% of respondents who think they receive not enough information scored their utility much lower than the 2% that think they receive too much information.
- Middle-aged customers score the utilities lowest for trust, value for money, affordability and quality of services. They are also the group that are most likely to want more information. However, survey data shows that this corresponds with the time of life that individuals are at their "least happy" that accounts for this lower score.
- Different survey methods will give different results. Satisfaction with water quality is highest for respondents older than 65 years. This helps explain why phone research yields higher results as they tend to get older respondents.
- Communication strategies on drinking water quality should be targeted to specific cultural groups where there we can see large differences in drinking the tap water. This in turn affects the scores for trust, value for money, affordability and of course quality of service.
- Concession cards may be too generous with customers on concession cards rating a higher level of affordability than those without a card.
- Older respondents are far less likely to think that climate change is caused by human activity. There is also a geographical difference to this belief. This will influence how we design and carry out any engagement around water security planning.

Headline results

- For trust, value for money, affordability and quality of services water utilities rated similar to electricity and gas but significantly lower than mobile phone, internet providers and Australia Post. But customers rated us higher than local councils. (insert graph)
- Middle-aged respondents scored us the lowest.
- On average, one third of people don't always drink water out of the tap. 13% never drink water straight from the tap. However these figures vary significantly among the utilities.
- People from different cultural backgrounds have different habits when it comes to drinking tap water. 46% of people with a Chinese background do not drink tap water.
- Satisfaction with the water quality was highest in Canberra, Melbourne and Sydney.
- On average 61% of customers were able to correctly name their water utility unprompted.
- Half of all customers did not know that their water utility also looks after their sewerage services. (insert graph)
- On average, only about 20% of customers had contacted the water utility in the last 12 months. Contact increases trust for regional utilities but this was not the case for the urban utilities.
- Our attitudes regarding the building of dams varies by state. More than 50% of respondents in South East QLD and Sydney think that building dams is a solution to our water problems. Some of the regional Victorian areas also scored above 50%.
- Attitudes to climate change vary across demographics and regions. The belief that climate change is caused by human activity decreases with age. It is also lowest in QLD and some of the regional utilities.
- Customers who identify themselves as 'future-focused' have the highest levels of trust while those that identify as 'price focused' are significantly lower. "Price focused" customers also make up 38% of respondents. Uninvolved customers score utilities the lowest for trust (insert graph)
- Only 18% of customers are aware that their water utility offers financial hardship support. But if they are aware of the programs, they score their utility significantly higher for trust, value and most of all affordability.

Purpose of the Survey

This national survey was conducted to:

- determine how water utilities are perceived, particularly in the area of value for money and trust compared to other service sectors
- identify those attributes that influence a customer's perceptions of value for money and trust
- carry out benchmarking of Australian water utilities, identify good performers and share successful strategies
- identify and collaborate on addressing industry-wide gaps
- provide data on customer attitudes, preferences and behaviours to inform WSAA policy work and customer engagement strategies

Water Utility Insights from the Survey

At the end of February 2016 WSAA will ran a workshop to discuss the results. The purpose is for members to share their own insights from their results, share successful strategies of the high performers, discuss how we address some of the common gaps across the industry and provide some recommendations for indicators and questions that we can potentially use on an ongoing basis to measure and benchmark our performance. The detailed analysis that forms the bulk of this report was carried out by WSAA with support from Insync. However the utilities also developed their own insights from the survey data in conjunction with their own research

- It highlighted the low level of awareness that the water utility also provides sewerage service
- Value for money was lower than expected. For those utilities that measure VFM, it was useful for them to see that this is a problem for all water utilities.
- They found the comparison to other sectors very valuable since customers are comparing their experience not to other water utilities but providers of similar services. It was interesting to note that water provision has the 2nd lowest VFM score of all the sectors.
- It was useful to have another source of data to see if aligned with the results from the utilities own survey. In some cases where the results did not align, it flagged potential review of the survey methodology.
- Different cultural groups require tailored communication. Utilities also identified the groups that they need target in regards to more research or specialised programs.
- Different perceptions of those in units and those in houses. What drives this?
- Identified some additional questions that they would like to add into their own surveys
- The section on beliefs and how they differ around the country helps with targeting their messages to different demographics and also identifying regions which have similar values and beliefs.

Improvements on the Survey

This was collated from the workshop as well as emails from some of the 100+ member employees that have access to the portal.

- The question about drinking the water 'straight from the tap' needs to be reconsidered as it is ambiguous
- Need a better way to classify regional versus urban respondents
- It would be good to further identify segments based on levels of engagement and involvement

Detailed Analysis

Regional and State Comparison

The survey results showed that there is no one state or region that outperforms all the rest in every category. It appears that there are some factors in play in different states that affect how respondents see their water utility. For example, respondents in NSW and in particular Sydney scored all service providers highly. The recent Choice Consumer Sentiment Survey conducted at approximately the same time (July 2015) shows that NSW is leading the states in positivity with 37% rating the economy as good compared to about a 24% in other states. Similarly, poor scores for some utilities in some cases may be the result of recent restructure, negative publicity or a lower socio-economic customer base. This is supported by the survey results which show that those customers who feel they are comfortable score significantly higher than those that feel they have trouble meeting basic needs.

Metropolitan versus Regional comparison

Most of the regional data is from Victoria and Tasmania, with one regional utility from NSW. While there are likely to have been a minor number of regional respondents from SA and WC, this survey did not allow for making this distinction within a utility.

Some of the differences in respondent characteristics are shown below.

	Metropolitan	Regional
Number of respondents	4422 (74%)	1551 (26%)
Number of utilities	11	10
States	NSW, VIC, QLD, ACT, WA, SA	VIC, TAS, NSW
Holds concession card	41.3%	50.1%
Speaks another language at home	11.4%	5.2%
Financial situation	Live comfortably – 27.2% Don't have enough – 4.5%	Live comfortably – 20.6% Don't have enough – 5.7%
House or unit	House – 71.7% Semi /townhouse – 10.8% Unit – 16.8%	House – 87.8% Semi/ townhouse – 3.2% Unit – 8.4%

In general, customers rated overall quality of products and services higher in metro areas (5.9) compared to regional areas (5.5). Metro customers (7.3) were more satisfied with the quality of their drinking water compared to regional customers (6.9). Metro customers rated affordability and value for money higher as well.

There was not a great deal of difference between the metro and regional areas in regards to thoughts around climate change, though there were particular states where there were clear differences. More people in regional areas believed there were moderate water shortages in their area but level of concern was low and about the same as the metro customers.

Regional customers had a higher level of awareness. They were more likely to know the name of their water utility and were more likely to know that their water utility also managed sewage. Customers of regional utilities who had contacted the utility scored their water utility significantly higher than customers that had not contacted their utility. This was not the case for metro customers. In general customers of the regional utilities who contacted the water utility with an issue were much happier with the resolution than those from metro utilities (6.8 compared to 6.5).

Victoria

Respondents 2223 Number of utilities 10

Key Influencers

- Large number of regional respondents represented compared to other states
- Renters receive a water bill whereas in other states owners receive the water bill

In general

Victorian utilities can be classified as the three Melbourne metropolitan utilities and the regional utilities. They made up 37% of all respondents with most of the regional respondents. Customers in Melbourne score their drinking water high. Regional Victorians have a high level of awareness of their water utility and the services they provide.

NSW

Respondents 920 Number of utilities 3

Key influencers

- High number of concession card holders (Hunter and Shoalhaven)
- Sydney has one of highest number of people who speak a language other than English at home
- Shoalhaven has the largest percentage of customers who identify as 'not having enough to meet basic needs'

In General

NSW on the whole scored quite highly but this is possibly due to the more optimistic outlook of NSW residents and in particularly Sydney. Sydney-siders in particular were quite supportive of dams compared to other capital cities. Sydney was the only city where customers who didn't drink the water stated that health concern with the water was equally high as taste as the reason why they didn't drink the water.

Queensland

Respondents 1206 Number of utilities 3

Key influencers

- All the customers surveyed were residents of South East QLD
- SEQ has undergone significant water industry reform over the past few years with new water utilities formed as opposed to council-run utilities
- Gold Coast Water is still a council run water utility

In General

As a state, the awareness of the water utilities and services they provide was the lowest with a great deal of confusion with council responsibilities. Survey respondents had the lowest level of belief in man-made climate change.

Tasmania

Respondents 403 Number of utilities 1

Key influencers

- The state has recently gone through a restructure moving from numerous council run utilities, to four utilities and now to one utility, along with the introduction of economic regulation
- 51% of survey respondents were concession card holders

Western Australia

Respondents 401 Number of utilities 1

In General

Western Australians scored their water utility highly in comparison to other service providers and they were one of the top performers when benchmarked against other utilities. Customers were strong believers in anthropogenic climate change, most likely due to the fact that Perth is the only city that is reliant on non-rainfall dependent water sources with desalination currently providing approximately 50% of the cities supply.

South Australia

Respondents 402 Number of utilities 1

In General

There is only one water utility in South Australia and it covers urban, regional and rural towns. South Australians have one of the highest ownership of rainwater tanks (52% compared to an average of 30%) and (along with Melburnians) are the least likely to think dams are the solution to water shortages.

ACT

Respondents	402	Number of utilities	1

Key influencers

- Highest percentage of respondents that identify as 'comfortable'
- Recently changed their brand

In General

ACT customers are the most satisfied with their drinking water and most likely to drink the water.

Comparison to other Service Providers

Key messages

- Overall utilities scored similar to electricity lower than other service providers but higher than councils.
- There were big differences between states, particularly in comparison to electricity and gas.
- Relative to other providers, utilities scored best overall on trust.
- Relative to other providers, value for money and affordability was the lowest. Possible reasons for this could be the lack of customer choice in their water provider (as with their council). The other factor is that water is a low involvement good. Many people, as demonstrated by the survey have a low awareness of the services actually provided.

Strong Performers

The strong performers have been identified *relative to how they scored to other service providers* rather than just the individual score. Note that the portal ranks utilities based on the latter.

- Sydney and Melbourne (three metros combined) customers scored their water utility higher than gas, electricity and councils for all four questions
- Sydney Water, Goulburn Valley Water, Yarra Valley Water, Water Corporation were the strongest overall performers for this section with Wannon Water (trust) and Shoalhaven (value for money) also scoring reasonably well for particular categories.

Results

Respondents were asked to rate seven different service providers: Electricity, Water, Gas (where applicable), Local Council, Internet provider, mobile phone provider and Australia Post. The respondents were asked their level of agreement (0=strongly disagree, 10 = strongly agree) with a series of statements.

- Taking into account all services delivered by each of the following providers, please rate your level of agreement with "my .... provides value for money"
- Thinking about the affordability of services delivered please rate your level of agreement with "my .... delivers affordable services"
- Taking account of all aspects of services delivered, please rate your level of agreement with "my .... Delivers high quality products and services"
- Thinking about your experience with each of the following providers, please rate your level of agreement with "I trust ....."

On average water scored above local councils with a very similar score to gas and electricity but significantly lower than internet, mobile phone and Australia Post.

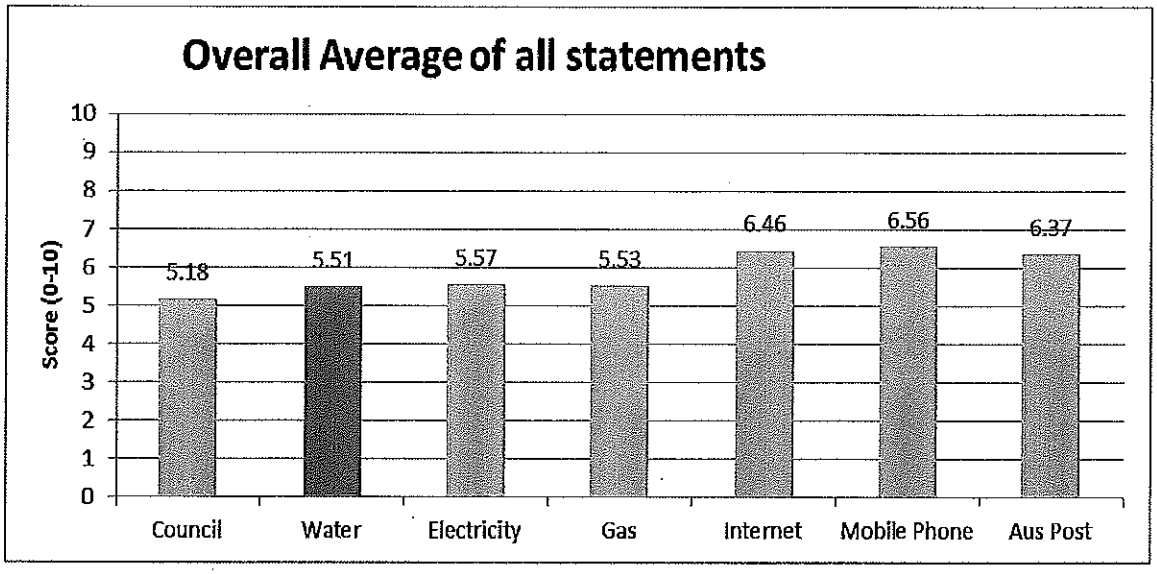


Figure 1: Overall average score for value for money, affordability, trust and quality of products and services

The best scoring category was quality followed by trust.

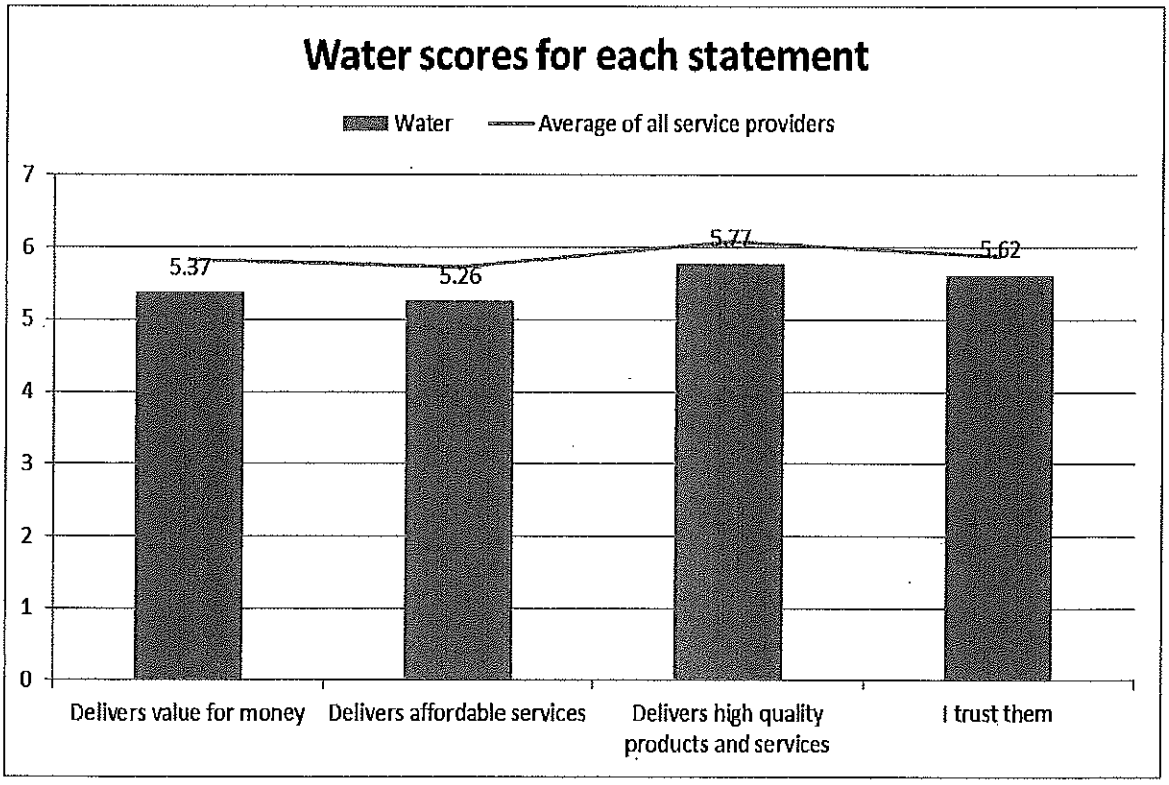


Figure 2 Water scores (out of 10) for each of the statements

However, relative to other service providers, trust is actually the strongest category for water utilities with 5 water utilities (25%) scoring above the average for service providers in their area of operation.

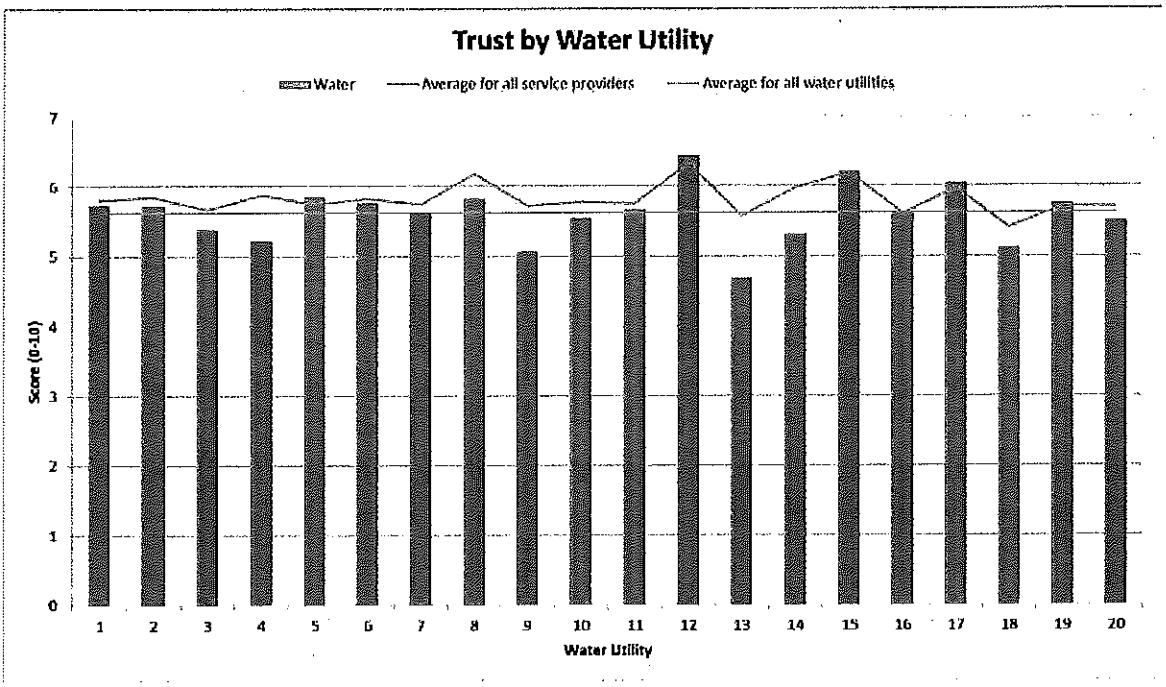


Figure 3 Trust scores by utility

Water Quality

Key messages

- Satisfaction with the quality of the water is a strongly related to trust and value for money.
- On average, two thirds of people drink water directly out of the tap and 87% drink water at least some of the time out of the tap. However these figures vary significantly among the utilities.
- People from different cultural backgrounds have different habits when it comes to drinking tap water. 46% of people with a Chinese background do not drink tap water.

Top performers

- Customers of Icon in the ACT scored their water quality the highest. They also have the highest proportion of customers who drink or sometimes drink the water (95%)
- Satisfaction with the water quality was highest in Canberra, Melbourne and Sydney.

Results

In general the quality of the water was one of the highest scoring attributes for water utilities with an average of 7.2 out of 10. However the results did show significant variation between utilities.

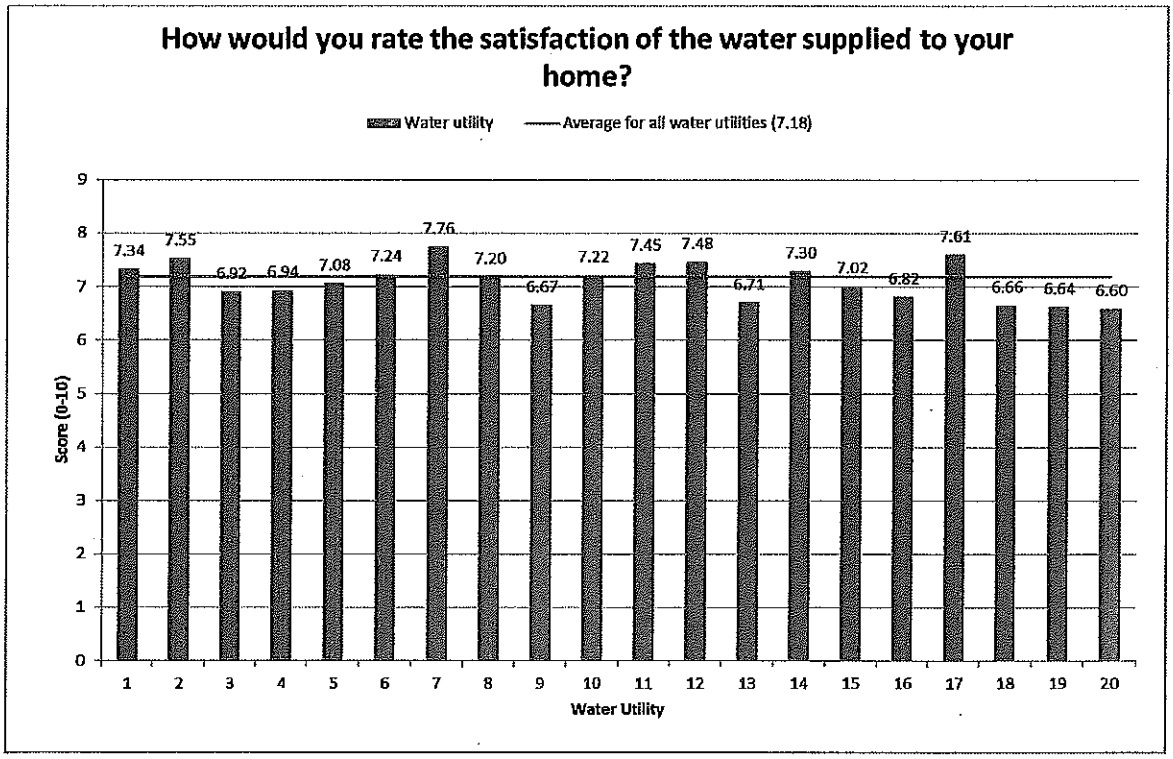


Figure 4 Satisfaction with the water quality

The highest satisfaction rating is for Icon Water in Canberra. Overall satisfaction is higher for urban providers (7.24 out of 10) compared to regional providers (7.02 out of 10).

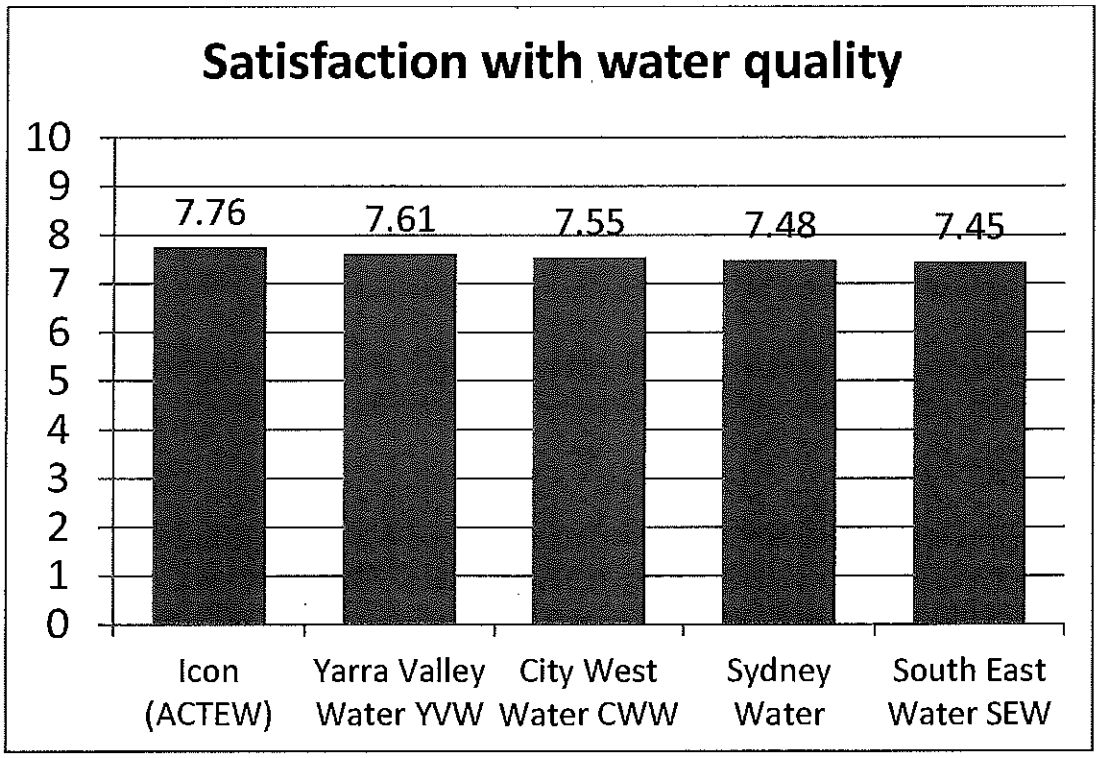


Figure 5: Top five providers in terms of satisfaction with quality of water

There is significant variation across utilities in the percentage of respondents that drink tap water.

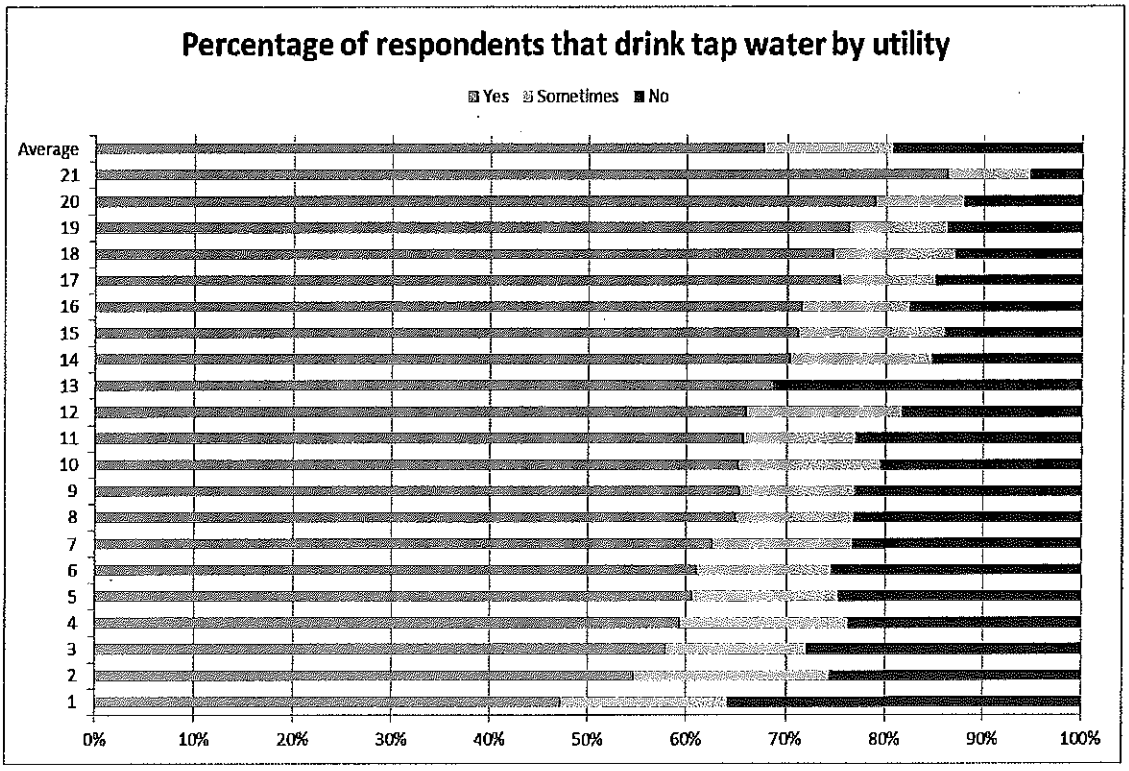


Figure 6 Responses to "do you drink water straight out of the tap"

For those that do not (or only sometimes) drink water out of the tap, the most commonly reason provided is taste (57%), followed by potential health risks (30%). There are some notable exceptions. In one city, both taste and health scored equally high (46%).

Cultural background also makes a difference. Those respondents that speak Chinese at home are least likely to drink the water whereas those in India are most likely.

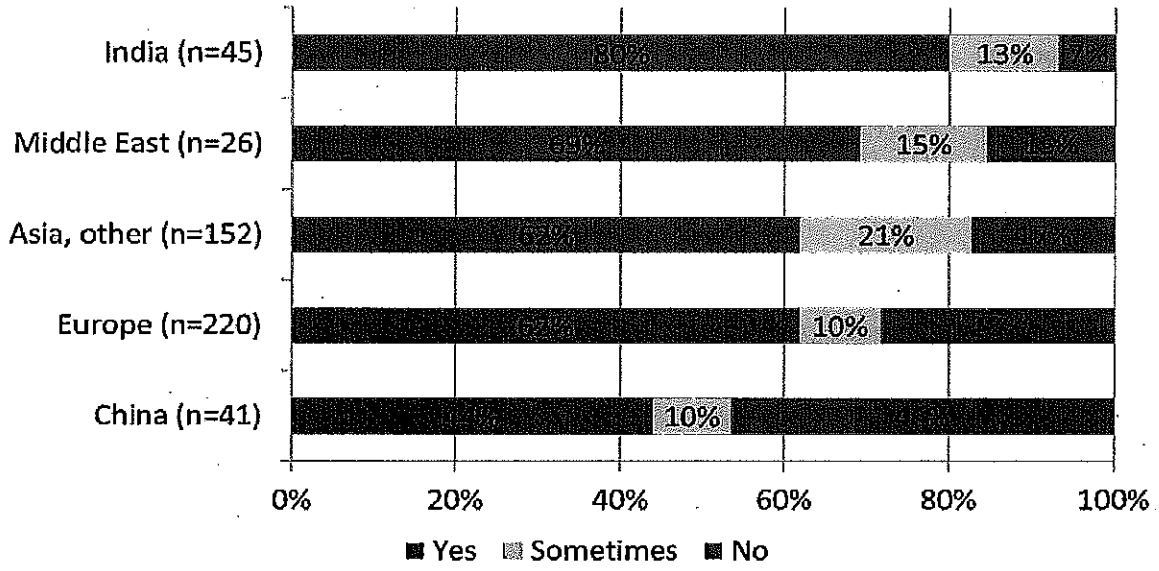


Figure 7 Drink tap water by cultural background

Awareness

Key messages

- Awareness of brand and the services provided is important. Those utilities that had a high level of awareness scored their utility higher for satisfaction with drinking water quality.
- Customers who were aware that their water utility offered financial hardship programs scored their water utility significantly higher for affordability as well as the other attributes.

Top Performers

- Regional water utilities, in particular Regional utilities generally had the highest level of awareness with 80% (Wannon Water) and 75% (Coliban and Gippsland Water)

Results

Knowing who your water utility is, the services they provide and programs to assist those customers experiencing financial hardship were on average lower than expected. There is a relationship between awareness and satisfaction levels of respondents with customers who knew their water utility provided sewerage services also scoring the utility higher for trust, value for money and the quality of drinking water.

About half of respondents didn't realise that their water utility also removed and treated their sewage. The best for any utility by for was about 83% (Wannon Water) with other Victorian regionals also scoring well. The Melbourne retailers and Water Corporation were the best of the capital cities with awareness of about 60%. Those utilities that are councils or are council owned had the lowest level of awareness with most respondents thinking that the council looked after sewage.

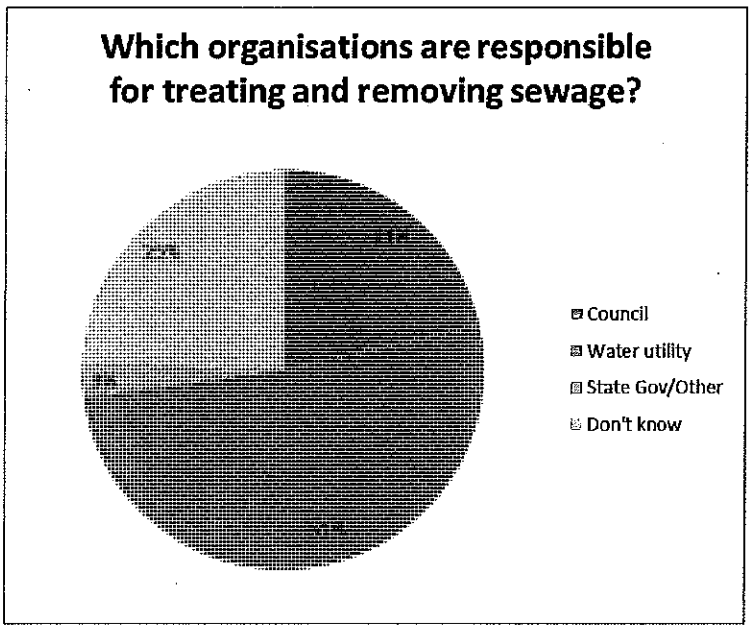


Figure 8: Who is responsible for treating and removing sewage?

Respondents were asked to type in the name of their water utility. On average 61% of respondents could unprompted correctly name their water utility. Regional utilities generally had the highest level of awareness with 80% (Wannon Water) and 75% (Coliban and Gippland Water)

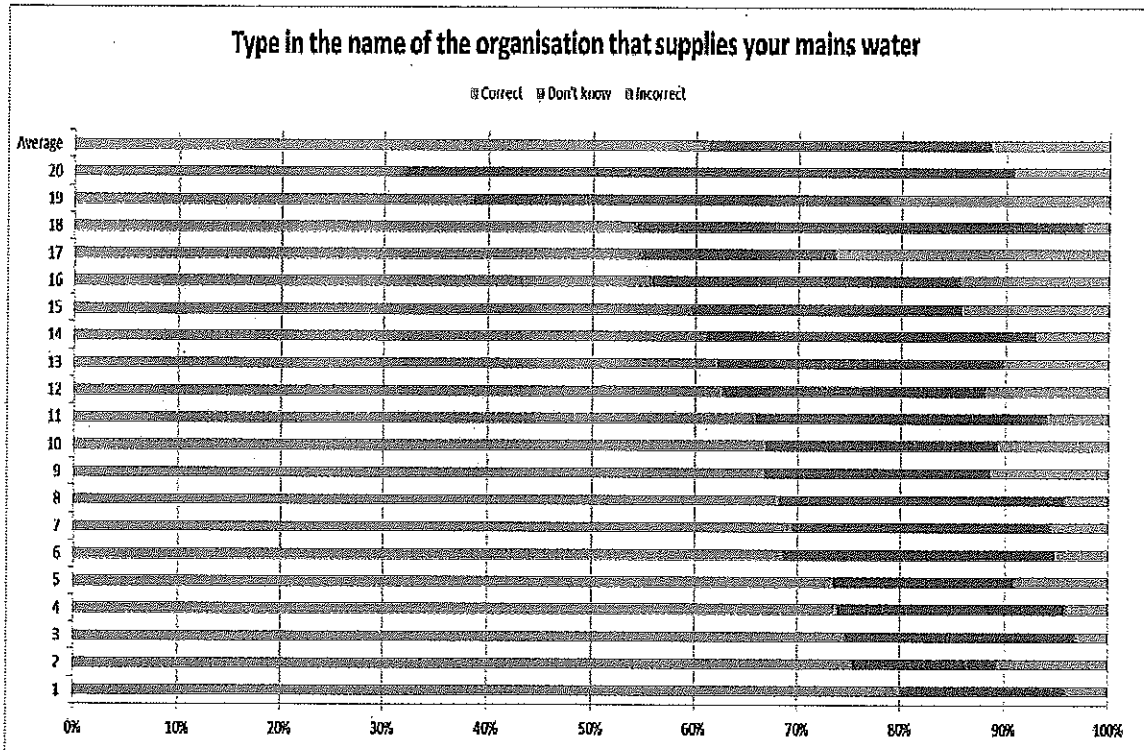


Figure 9 Respondents who could name their water utility

45% of respondents correctly identified their local council as being responsible for stormwater management but 24% still believed it was the responsibility of the water utility.

Awareness of financial hardship programs was on average low at 18%. However those that were aware of these programs scored the utility higher for trust, quality, value for money and most significantly for affordability.

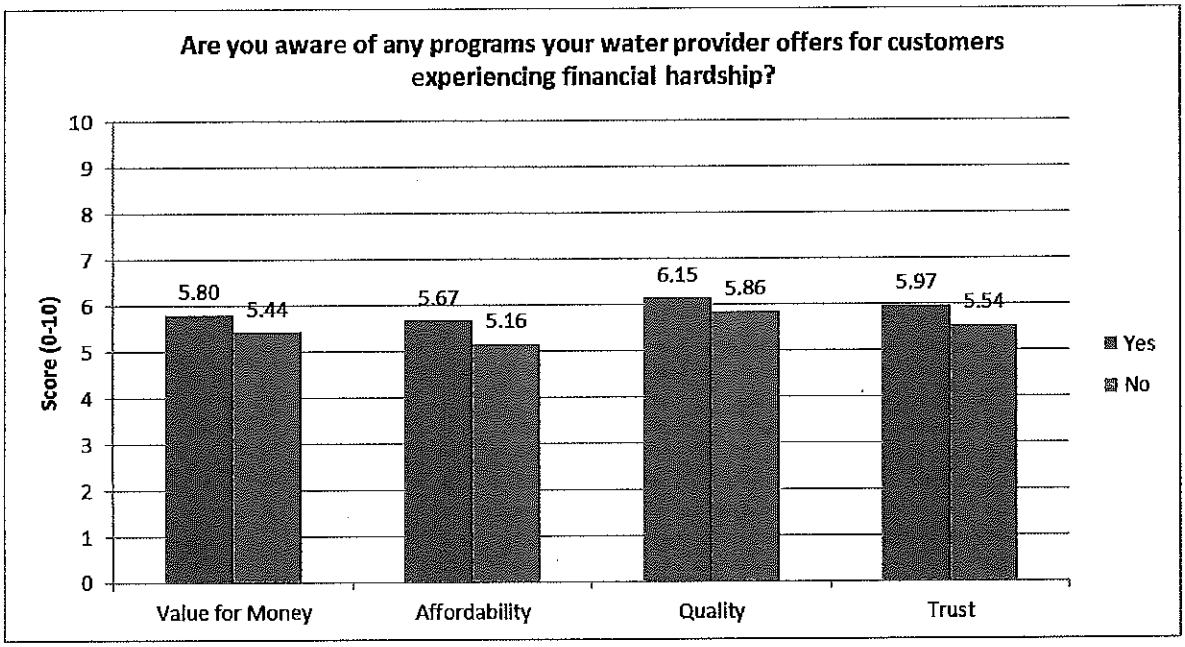


Figure 10 Awareness of financial hardship programs versus trust, value, affordability and quality

There is a relationship between awareness and how a customer perceives their water utility. For example, those customers who knew that their water utility did sewage services scored the quality of the water higher. They also had higher levels of trust and value for money. Increasing brand awareness also increased the way the customer scored the utility.

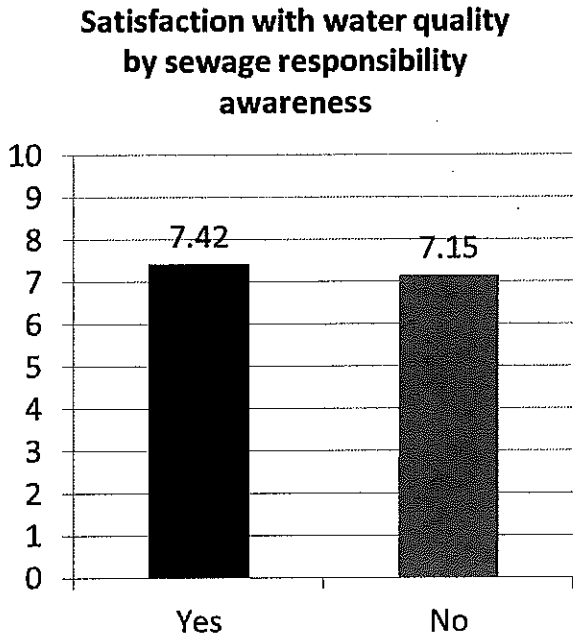


Figure 11: Satisfaction versus Sewage responsibility awareness

Appendix 1: Regional Classification

	Utility	Classification	Comments
1	Barwon (Geelong)	Regional	
2	Central Highlands Water	Regional	
3	City West Water CWW	Metro	
4	Coliban Water (Bendigo)	Regional	
5	Gippsland Water	Regional	
6	Gold Coast Water (QLD)	Metro	
7	Goulburn Valley Water (Shepparton)	Regional	
8	Hunter Water	Metro	Covers some regional areas but most customers in metro centre of Newcastle
9	Icon (ACTEW)	Metro	
10	Queensland Urban Utilities (QUU)	Metro	
11	SA Water	Metro	Covers whole state of SA but most customer in metro areas
12	Shoalhaven	Regional	
13	South East Water SEW	Metro	
14	South Gippsland Water	Regional	The results have been excluded from peer comparison due to small number of responses
15	Sydney Water	Metro	
16	TasWater	Regional	Covers metro centres but these are closer to regional centres than capital cities
17	Unitywater	Metro	
18	Wannon Water	Regional	
19	Water Corporation (WA)	Metro	Covers whole state of WA but most customers in metro areas
20	Western Water (Sunbury Vic)	Regional	
21	Yarra Valley Water YVW	Metro	

Appendix 2: Survey Methodology

While no survey methodology is perfect, WSAA chose and online survey where respondents were paid for their responses and were not aware of who was sponsoring the survey. This method was chosen to hopefully reach a broader demographic and ensure that we were not surveying individuals with a high knowledge, or vested interest in the water industry.

- This survey was carried out using Insync as the consultant and SSI as a global panel provider.
- Survey questions were developed by WSAA and Insync in consultation with several water utilities
- Survey was completed online
- Respondents were paid for carrying out the survey
- Respondents were not aware of who was sponsoring the survey. Only after the comparison questions with other sectors did it become obvious that it was a survey about water utilities
- Respondents were sourced using a panel provider with a requested number in each of the utility area of operations
- There were 5973 responses in total, statistically robust
- All respondents were over 18
- Survey selected for respondents who were connected to a centralised system and paid a water bill

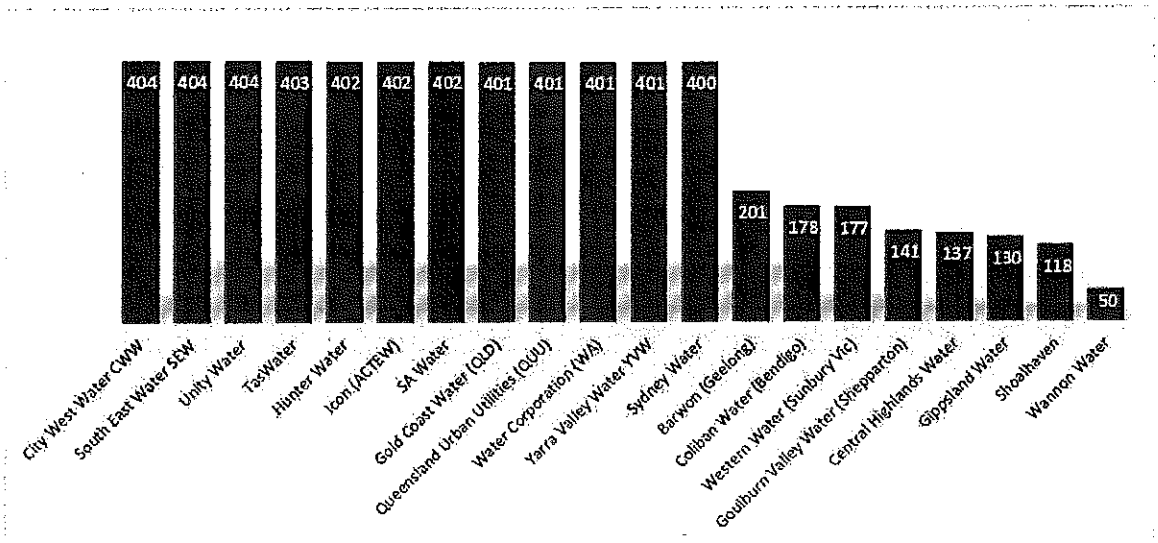


Figure 12 Number of respondents by utility

Shoalhaven City Council — TBL Sewerage Performance — 2014-15

SEWERAGE SYSTEM - Shoalhaven City Council serves a population of 81,200 (41,870 connected properties) and has 13 sewage treatment works providing advanced secondary treatment. The system comprises 127,710 EP treatment capacity (Intermittent Extended Aeration (Activated Sludge), Trickling Filter and Membrane Biological Reduction), 217 pumping stations (661 ML/d), 228 km of rising mains and 989 km of gravity trunk mains and reticulation. 21% of effluent was recycled (Indicator 27) and the treated effluent is discharged to land river and ocean.

PERFORMANCE - Residential growth for 2014-15 was 0.9% which is similar to the statewide median. Shoalhaven City Council achieved 100% implementation of the outcomes required by the NSW BPM Framework. The 2015-16 typical residential bill was $772 which was above the statewide median of $697 (Indicator 12). The economic real rate of return was 3.9% which was greater than the statewide median (Indicator 46). The operating cost per property (OMA) was $500 which was above the statewide median of $420 (Indicator 50). Sewage odour complaints were less than the statewide median of 0.8 (Indicator 21). Shoalhaven Council reported 10 Category 2 (limited impact) public health incidents. Council did not comply with the SS requirements of the environmental regulator for effluent discharge. The current replacement cost of system assets was $700M ($14,800 per assessment), cash and investments were $8M, debt was $38M and revenue was $46.7M (excluding capital works grants). Council paid a dividend of $1.276M.

IMPLEMENTATION OF OUTCOMES REQUIRED BY THE NSW BEST-PRACTICE MANAGEMENT (BPM) FRAMEWORK

(1) Complete current strategic business plan & financial plan	YES[11]	(2e) Pricing - DSP with commercial developer charges	Yes		
(2) (2a) Pricing - Full Cost Recovery without significant cross subsidies	Yes	(2f) Pricing - Liquid trade waste approvals & policy	Yes		
(2b) Pricing - Appropriate Residential Charges	Yes	(3) Complete performance reporting (by 15 September)	YES		
(2c) Pricing - Appropriate Non-Residential Charges	Yes	(4) Integrated water cycle management strategy	YESC [11]		
(2d) Pricing - Appropriate Trade Waste Fees and Charges	Yes	IMPLEMENTATION OF ALL OUTCOMES	100%		

TRIPLE BOTTOM LINE (TBL) PERFORMANCE INDICATORS

		NWI	No.			LWU RESULT	RANKING >10,000 properties	RANKING All LWUs	MEDIANS Statewide	MEDIANS National
							Note 1	Note 2	Note 3	Note 4
						Col 1	Col 2	Col 3	Col 4	Col 5
UTILITY	CHARACTERISTICS	C5	1	Population served: 81,200						
		C8	2	Number of connected properties: 41,870	Number of assessments: 47,250					
		C6	3	Number of residential connected properties: 39,900						
			4	New residences connected to sewerage (%)	%	0.9	5	3	1.0	
		A6	5	Properties served per kilometre of main	Prop/km	34			38	40
		W18	6	Volume of sewage collected (ML)	ML	9,387			5,200	5,640
			7	Renewals expenditure (% of current replacement cost of system assets)	%	0.1	5	5	0.5	
			8	Employees per 1000 properties	per 1,000 prop	2.1	5	4	1.6	
SOCIAL	CHARGES & BILLS	P4		Description of residential tariff structure:	access charge/prop; independent of land value					
		P4.1	11a	Residential access charge for 2014-15 ($/assessment)	$ 2014-15	750	3	4	669	620
			11	Residential access charge for 2015-16 ($/assessment)	$ 2015-16	772	3	4	697	
		P6	12a	Typical residential bill for 2014-15 ($/assessment)	$ 2014-15	750	3	4	669	667
			12	Typical residential bill for 2015-16 ($/assessment)	$ 2015-16	772	3	4	697	
			13	Typical developer charge for 2015-16 ($/equivalent tenement)	$ 2015-16	8,340	2	1	5,100	
			14	Non-residential sewer usage charge (c/kL)	c/kL	140	4	3	150	
		F6	15	Revenue per property - Sge ($)	$/prop	1120	2	1	882	947
	HEALTH		16	Sewerage Coverage (% of Urban Population with Reticulated Sge Service)	%	97.8	3	2	97.9	
		E3	17	Percent of sewage treated to a tertiary level (%)	%	88	4	4	97	91
			18	Percent of sewage volume treated that was compliant (%)	%	94	4	4	100	
			19	Number of sewage treatment works compliant at all times		12 of 13				
	SERVICE LEVELS		21	Odour complaints per 1000 properties	per 1,000 prop	0.1	2	3	0.8	
		C11	22	Service complaints - sewerage per 1000 properties	per 1,000 prop	0.4	1	1	6	1
		C16	23a	Average sewerage interruption (minutes)	min	60	1	1	95	102
			25	Total days lost (%)	%	4.0	4	4	3.1	
ENVIRONMENTAL	NATURAL RESOURCE MANAGEMENT	W19	26	Volume of sewage collected per property (kL)	kL/prop	224	3	4	238	214
		W26	26a	Total recycled water supplied (ML)	ML	1,710	2	1	520	1,580
		W27	27	Recycled water (% of effluent recycled)	%	21	2	2	10	15
		E8	28	Biosolids reuse (%)	%	100	1	1	100	100
			30	Energy consumption - sewerage (kWh/ML)	kWh/ML	900	3	4	790	
			31	Renewable energy consumption (% of total energy consumption)	%	0	2	1	0	
		E12	32	Net greenhouse gas emissions - WS & Sge (net tonnes CO2 equivalents per 1000 properties)	t CO2	440	4	4	410	393
	ENVIRONMENTAL PERFORMANCE		33	90th Percentile licence limits for effluent discharge:	BOD 40 mg/L; SS 40 mg/L					
			34	Compliance with BOD in licence (%)	%	100	1	1	100	
			35	Compliance with SS in licence (%)	%	94	5	5	100	
		A14	36	Sewer main breaks and chokes (per 100 km of main)	per 100km main	11	2	2	35	17
			37a	Sewer overflows (per 100 km of main)	per 100km main	20	3	5	10	
		E13	37b	Sewer overflows reported to environmental regulator (per 100km of main)	per 100km main	0.8	3	4	0.9	0.5
			39	Non res & trade waste % of total sge volume	%	15	4	3	20	
ECONOMIC	FINANCE		43	Revenue from non-residential plus trade waste charges (% of total revenue)	%	14	4	4	18	
			44	Revenue from trade waste charges (% of total revenue)	%	0.9	4	3	2.0	
		F18	46	Economic real rate of return - Sge (%)	%	3.9	1	1	1.7	3.0
			46a	Return on assets - Sge (%)	%	3.4	1	1	1.3	
			48a	Loan payment per property - Sge ($)	$/prop	181	3	2	110	
		F24	48b	Net profit after tax - WS & Sge ($'000)	$'000	20,770	1	1	2340	7,120
	EFFICIENCY		49	Operating cost (OMA) per 100 km of main ($'000)	$'000	1,730	3	4	1,720	
		F12	50	Operating cost (OMA) per property ($) (Note 9)	$/prop	500	4	4	420	400
			51	Operating cost (OMA) per kL (cents)	c/kL	223	4	4	193	
			52	Management cost per property ($)	$/prop	188	4	5	160	
			53	Treatment cost per property ($)	$/prop	134	2	3	145	
			54	Pumping cost per property ($)	$/prop	89	4	4	72	
			55	Energy cost per property ($)	$/prop	32	1	2	37	
			56	Sewer main cost per property ($)	$/prop	51	3	3	51	
		F29	57	Capital Expenditure per property - Sewerage ($)	$/prop	300	2	2	204	217

NOTES :

1 Col 2 rankings are on a % of LWUs basis - best reveals performance compared to similar sized LWUs (ie. Col 1 is compared with LWUs with >10,000 properties).

2 Col 3 rankings are on a % of LWUs basis - best reveals performance compared to all LWUs (ie. Col 1 is compared with all LWUs). - see attachment.

3 Col 4 (Statewide Median) is on a % of connected properties basis- best reveals statewide performance (gives due weight to larger LWUs & reduces effect of smaller LWUs).

4 Col 5 (National Median) is the median value for the 75 utilities reporting sewerage performance in the National Performance Report 2014-15 (www.bom.gov.au).

5 LWUs are required to annually review key projections & actions in the later of their IWCM Strategy and financial plan and their Strategic Business Plan and to annually 'roll forward', review and update their 30-year total asset management plan (TAMP) and 30-year financial plan.

6 Non-residential access charge - $772, proportional to square of meter size. Sewer usage charge - 140 c/kL.

7 Non-residential and trade waste volume was 15% of total sewage collected.
Non-residential revenue was 14% of revenue from access, usage & trade waste charges, indicating fair pricing of services between the residential and non-residential sectors.

8 Compliance with Total N in Licence was 100%. Compliance with Total P in Licence was 100%.

9 Operating cost (OMA)/property was $500. Components were: management ($188), operation ($200), maintenance ($58), energy ($32), chemical ($7) & effluent/biosolids ($17).

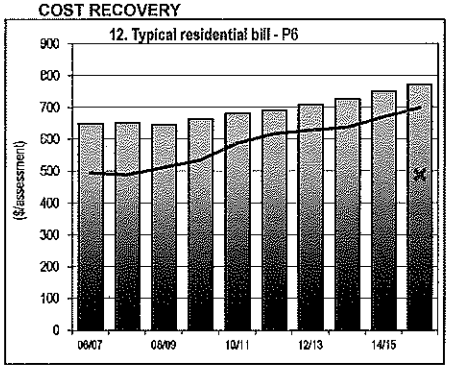
10 Shoalhaven City Council rehabilitations included 0.2% of its sewerage mains and 0.3% of its service connections. Renewals expenditure was $73,000/100km of main.

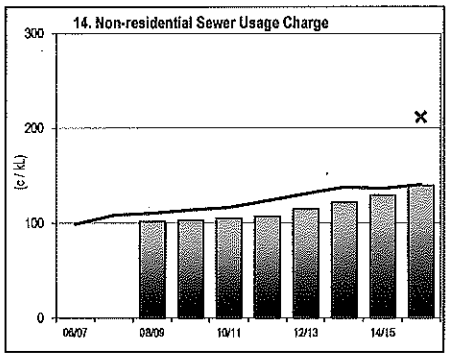
11 As Council's IWCM Strategy is over 6 years old, it will need to prepare a new 30-year IWCM Strategy, financial plan and report in accordance with the July 2014 IWCM Check List (www.water.nsw.gov.au).

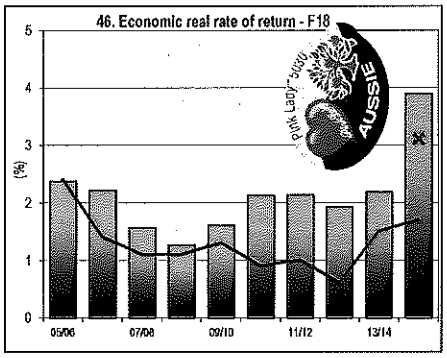
Shoalhaven City Council | **TBL Sewerage Performance** | **(page 2)** | **2014-15**

(Results shown for 10 years together with Statewide Median and 2014-15 Top 20%)

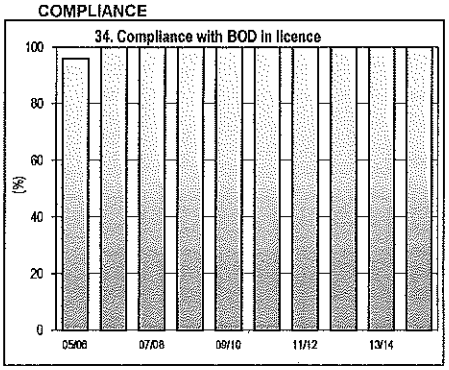
COST RECOVERY

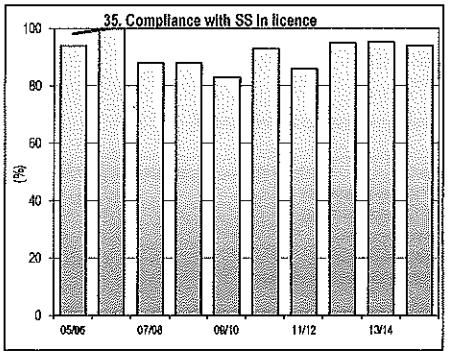


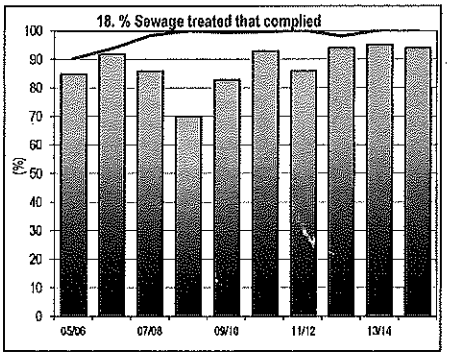




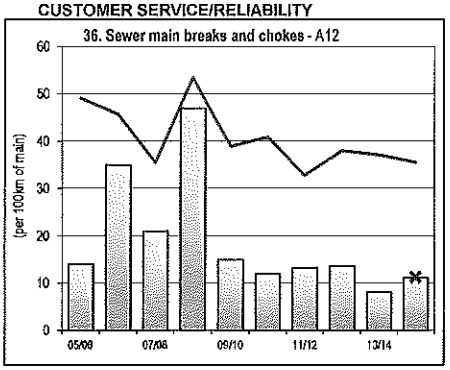
COMPLIANCE

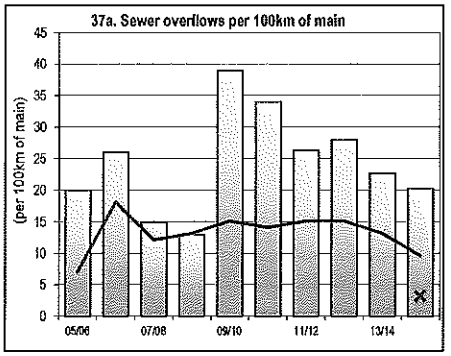


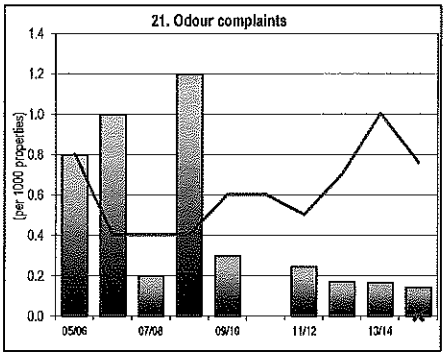




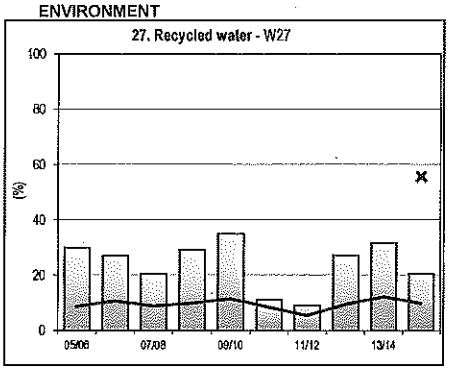
CUSTOMER SERVICE/RELIABILITY

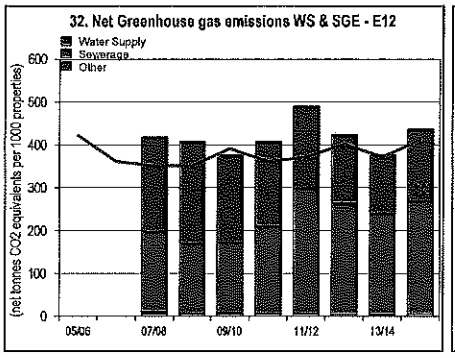


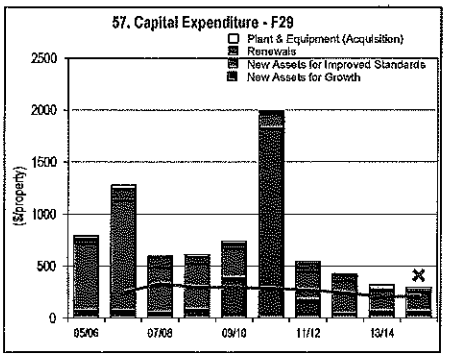




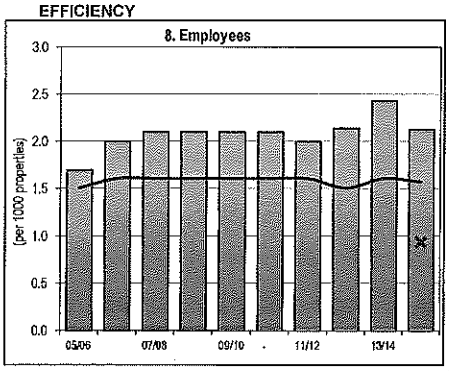
ENVIRONMENT

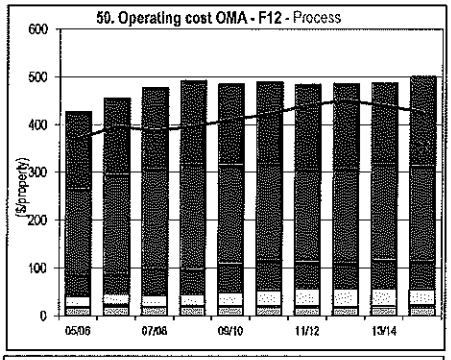


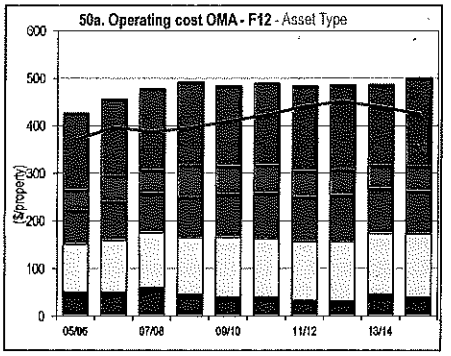




EFFICIENCY







NOTES:

1. Costs are in Jan 2015$ except for graphs 12 and 14, which are in Jan 2016$.

LEGEND
State Median for all years
Top 20% for 2014-15 ×

Shoalhaven City Council — TBL Water Supply Performance — 2014-15

WATER SUPPLY SYSTEM - Shoalhaven City Council serves a population of 89,100 (47,150 connected properties). Water is drawn from the Porters Creek, Kangaroo River and Shoalhaven River to supply townships from Berry and Kangaroo Valley in the north to Lake Tabourie in the south. Bamarang, Cambewarra, Danjera and Porters Creek Dams have a total storage capacity of 13,360 ML. The water supply network comprises 2 conventional water treatment works (103 ML/d), 1 microfiltration works at Kangaroo Valley (1.3 ML/d) and 1 direct filtration (10.5 ML/d), 38 service reservoirs (192 ML), 26 pumping stations, 115 ML/d delivery capacity into the distribution system, 481 km of transfer and trunk mains and 1084 km of reticulation. 85% of water supplied is potable and 15% nonpotable (1% recycled). The Northern areas are fully treated and the Southern areas are unfiltered (chlorinated).

PERFORMANCE - Shoalhaven City Council achieved 100% implementation of the outcomes required by the NSW BPM Framework. The 2015-16 typical residential bill was $315 which was much less than the statewide median of $593 (Indicator 14). The economic real rate of return was similar to the statewide median (Indicator 43). The operating cost (OMA) per property was $276 which was much less than the statewide median of $400 (Indicator 49). Water quality complaints were negligible compared to the statewide median of 3 (Indicator 25). Compliance was achieved for microbiological water quality (100% of the population, 4 of 4 zones compliant), chemical water quality and physical water quality. There were no failures of the chlorination system or the treatment system. Shoalhaven City Council reported no water supply public health incidents. Current replacement cost of system assets was $621M ($12,100 per assessment). Cash and investments were $39.2M, debt was $0.2M and revenue was $27M (excluding capital works grants).

IMPLEMENTATION OF OUTCOMES REQUIRED BY THE NSW BEST-PRACTICE MANAGEMENT (BPM) FRAMEWORK

(1) Complete Current Strategic Business Plan & Financial Plan	YES[12]	(3) Sound water conservation implemented	YES
(2) (2a) Pricing - Full Cost Recovery, without significant cross subsidies	Yes	(4) Sound drought management implemented	YES
(2b,2c) Pricing - Appropriate Residential Charges	Yes	(5) Complete performance reporting (by 15 September)	YES
(2d) Pricing - Appropriate Non-residential Charges	Yes	(6) Integrated water cycle management strategy	YESc[12]
(2e) Pricing - DSP with Commercial Developer Charges	Yes	IMPLEMENTATION OF ALL OUTCOMES	100%

TRIPLE BOTTOM LINE (TBL) PERFORMANCE INDICATORS

	NWI No.				LWU RESULT	RANKING >10,000 properties	RANKING All LWUs	MEDIANS Statewide	MEDIANS National
						Note 1	Note 2	Note 3	Note 4
					Col 1	Col 2	Col 3	Col 4	Col 5
UTILITY — CHARACTERISTICS	C1	1	Population served: 89100						
	C4	2	Number of connected properties: 47150	Number of assessments: 51260					
		3	Residential connected properties (% of total)	%	92			92	
		4	New residences connected to water supply (%)	%	1.5	2	2	1.1	
	A3	5	Properties served per kilometre of water main	Prop/km	31			31	34
		6	Rainfall (% of median annual rainfall)	%	151	1	1	116	
	W11	7	Total urban water supplied at master meters (ML)	ML	14,200			7,000	9,060
		8	Peak week to average consumption (%)	%	155	4	3	141	
		9	Renewals expenditure (% of current replacement cost of system assets)	%	0.4	3	3	0.4	
		10	Employees per 1000 properties	per 1,000 prop	1.4	3	2	1.4	
SOCIAL — CHARGES & BILLS	P1		Residential tariff structure for 2015-16: two part; independent of land value; access charge $80						
	P1.3	12a	Residential water usage charge for 2014-15 for all usage (c/kL)	c/kL (2014-15)	160	5	3	213	185
		12	Residential water usage charge for 2015-16 for all usage (c/kL)	c/kL (2015-16)	165	5	3	226	
	P3	14a	Typical residential bill for 2014-15 ($/assessment)	$ (2014-15)	309	1	1	566	589
		14	Typical residential bill for 2015-16 ($/assessment)	$ (2015-16)	315	1	1	593	
		15	Typical developer charge for 2015-16 ($/equivalent tenement)	$ (2015-16)	6,600	2	2	5,900	
	F4	16	Residential revenue from usage charges (% of residential bills)	%	75	1	2	72	66
	F5	17	Revenue per property - water ($/property)	$/prop	570	5	5	827	861
SOCIAL — HEALTH		18	Water Supply Coverage (% of Urban Population with reticulated WS)	% of population	99.2	4	2	99.5	
		18a	Risk based Drinking Water Management System (DWMS)?	Yes/No	Yes				
		19	Physical compliance achieved? Note 10	Yes/No	Yes	1	1		
		19a	Chemical compliance achieved? Note10	Yes/No	Yes	1	1		
	H4	19b	% population with chemical compliance	% of population	100	1	1	100	
		20	Microbiological (E. coli) compliance achieved? Note 10	Yes/No	Yes	1	1		
	H3	20a	% population with microbiological compliance	% of population	100	1	1	100	100
SOCIAL — SERVICE LEVELS	C9	25	Water quality complaints per 1000 properties	per 1,000 prop	0.5	2	2	3	2
	C10	26	Water service complaints per 1000 properties	per 1,000 prop	0.5	2	1	6	0.5
	C17	27	Incidence of unplanned interruptions per 1000 properties	per 1,000 prop	78	5	5	24	91
	C15	28	Average duration of interruption (min)	min	135	3	4	133	117
	A8	30	Number of water main breaks per 100 km of water main	per 100km	8	3	2	9	13
		31	Drought water restrictions (% of time)	% of time	0	1	1	0	
		32	Total days lost (%)	%	2.5	2	3	2.9	
ENVIRONMENTAL — NATURAL RESOURCE MANAGEMENT	W12	33	Average annual residential water supplied - STATEWIDE (kL/property)	kL/prop	143	1	1	166	181
		33a	Average annual residential water supplied - COASTAL LWUs (kL/property)	kL/prop	143	2	2	150	
		33b	Average annual residential water supplied - INLAND LWUs (kL/property)	kL/prop				225	
	A10	34	Real losses (leakage) (L/service connection/day)	L/connection/day	90	4	4	60	76
		35	Energy consumption per Megalitre (kiloWatt hours)	kWh/ML	709	3	4	700	
		36	Renewable energy consumption (% of total energy consumption)	%	0	1	1	0	
	E12	36a	Net greenhouse gas emissions - WS & Sge (net tonnes CO2 equivalents per 1000 properties)	t CO2	440	4	4	410	393
ECONOMIC — FINANCE		42	Current replacement cost per assessment ($)	$/assessment	12,100	4	4	16,400	
	F17	43	Economic real rate of return - Water (%)	%	1.7	2	2	1.8	1.9
		44	Return on assets - Water (%)	%	2.3	1	2	1.0	
	F22	45	Net Debt to equity - WS & Sge (%)	%	-1	3	2	-1	11
	F23	46	Interest cover - WS & Sge		>100	1	1	4	2
		47	Loan payment per property - Water ($)	$/prop	6	4	3	69	
	F24	47b	Net profit after tax - WS & Sge ($'000)	$'000	20,770	1	1	2340	7120
ECONOMIC — EFFICIENCY		48	Operating cost (OMA) per 100km of main ($'000)	$'000	860	1	1	1,320	
	F11	48	Operating cost (OMA) per property ($/prop) Note 8	$/prop	276	1	1	400	455
		50	Operating cost (OMA) per kilolitre (cents)	c/kL	92	2	2	129	
		51	Management cost ($/prop)	$/prop	129	2	2	141	
		52	Treatment cost ($/prop)	$/prop	45	3	2	58	
		53	Pumping cost ($/prop)	$/prop	22	2	2	31	
		54	Energy cost ($/prop)	$/prop	17	3	2	18	
		55	Water main cost ($/prop)	$/prop	50	1	2	74	
	F28	56	Capital Expenditure ($/prop)	$/prop	218	3	2	155	163

NOTES:

1 Col 2 rankings are on a % of LWUs basis - best reveals performance compared to similar sized LWUs (ie. Col 1 is compared with LWUs with >10,000 properties).

2 Col 3 rankings are on a % of LWUs basis - best reveals performance compared to all LWUs (ie. Col 1 is compared with all LWUs).

3 Col 4 (Statewide Median) is on a % of connected properties basis- best reveals statewide performance (gives due weight to larger LWUs & reduces effect of smaller LWUs).

4 Col 5 (National Median) is the median value for the 76 utilities reporting water supply performance in the National Performance Report 2014-15 (www.bom.gov.au).

5 LWUs are required to annually review key projections & actions in the later of their IWCM Strategy and financial plan and their Strategic Business Plan and to annually 'roll forward', review and update their 30-year total asset management plan (TAMP) and 30-year financial plan.

6 2015-16 Non-residential Tariff: Access Charge based on Service Connection Size (40mm: $320), Inclining Block ; Usage Charge 165c/kL.

7 Non-residential water supplied was 38% of potable water supplied excluding non-revenue water.
Non-residential revenue was 32% of annual rates and charges, indicating fair pricing of services between the residential and non-residential sectors.

8 The operating cost (OMA) per property was $276. Components were: management ($129), operation ($80), maintenance ($36), energy ($17) & chemical ($13).

9 Rehabilitations included 1.2% of water mains, 0.67% of service connections and 8.4% of water meters. Renewals expenditure was $164,000/100km of main.

10 Compliance with ADWG 2011 for drinking water quality is shown as "Yes" if compliance has been achieved (indicators 19, 19a & 20).

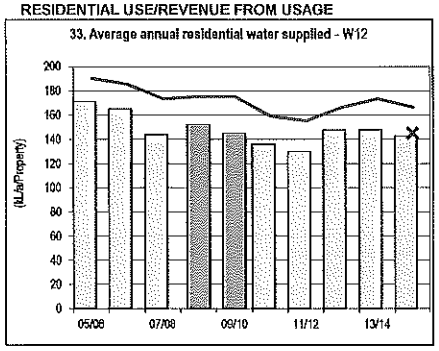
11 Shoalhaven City Council has 8 fully qualified water treatment operators who meet the requirements of the National Certification Framework.

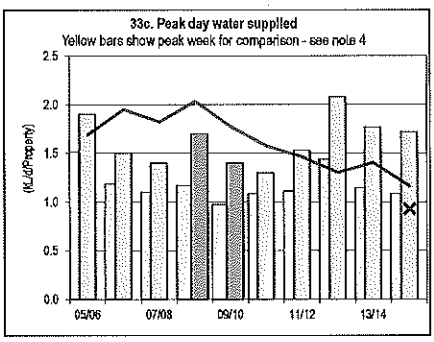
12 As Council's IWCM Strategy is over 6 years old, it will need to prepare a new 30-year IWCM Strategy, financial plan and report in accordance with the July 2014 IWCM Check List (www.water.nsw.gov.au).

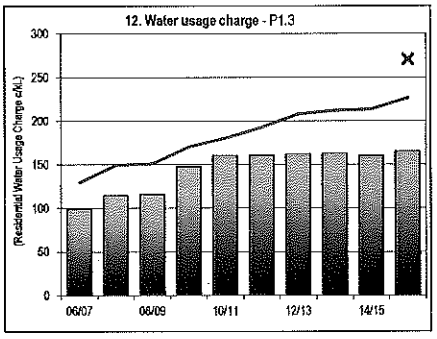
Shoalhaven City Council | **TBL Water Supply Performance (page 2)** | **2014-15**

(Results shown for 10 years together with Statewide Median and 2014-15 Top 20%)

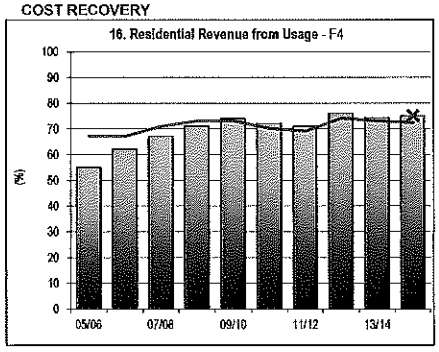
RESIDENTIAL USE/REVENUE FROM USAGE

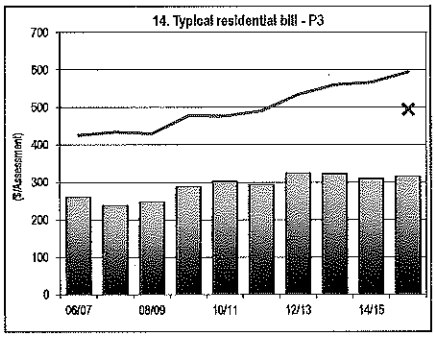


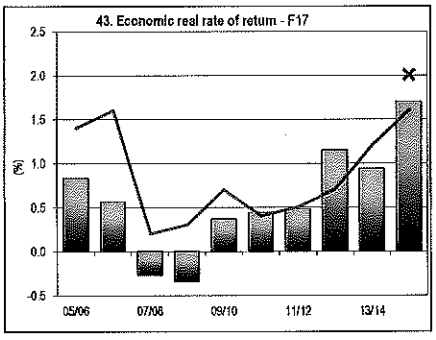




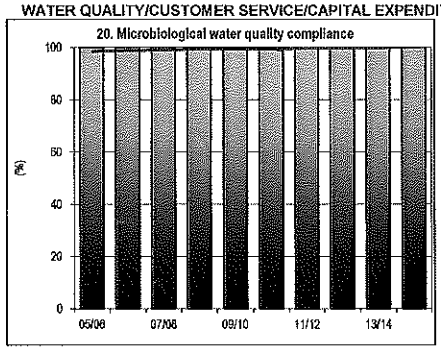
COST RECOVERY

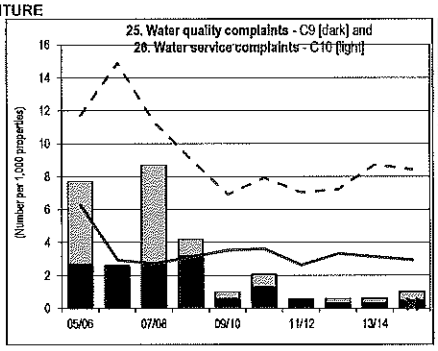


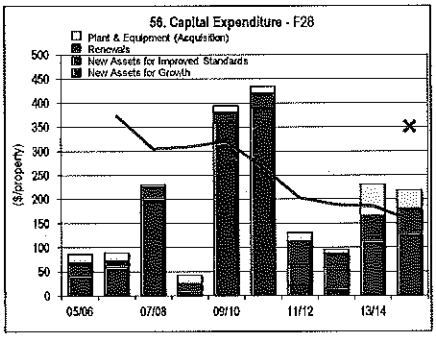




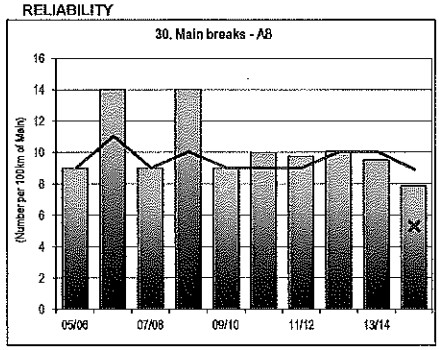
WATER QUALITY/CUSTOMER SERVICE/CAPITAL EXPENDITURE

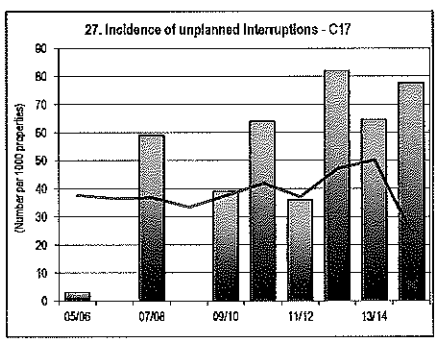


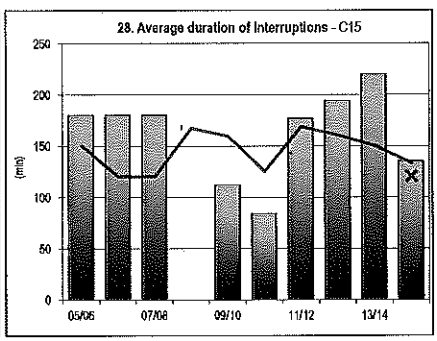




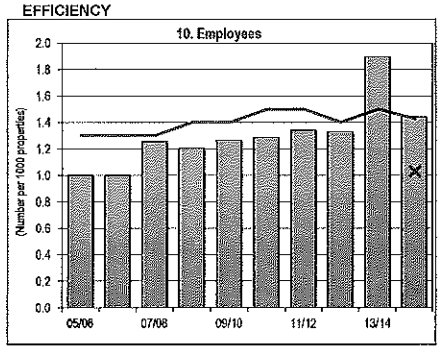
RELIABILITY

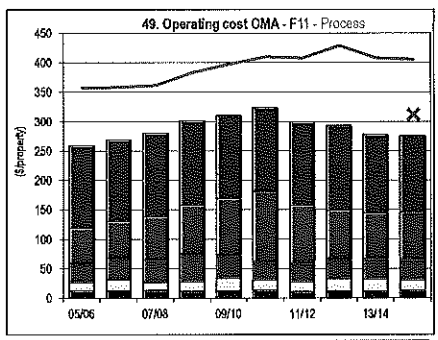


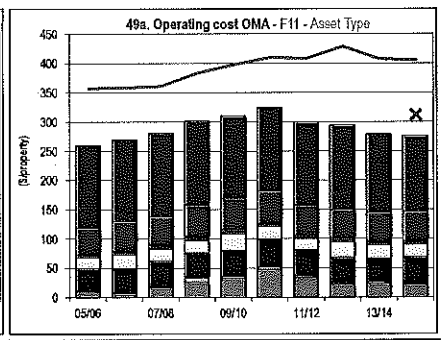




EFFICIENCY







NOTES:

1. Costs are in Jan 2015$ except for graphs 12 and 14, which are in Jan 2016$.
2. Microbiological water quality compliance 1999-00 to 2003-04 was on the basis of 1996 NHMRC/ARMCANZ Australian Drinking Water Guidelines for E. coli; from 2004-05 to 2010-11 compliance was on the basis of the 2004 NHMRC/NRMMC Australian Drinking Water Guidelines (ADWG) and for 2011-12 to 2014-15 compliance was on the basis of the 2011 ADWG.
3. Indicators 33 and 33c - Green shading of bars shows % of time Drought Water Restrictions applied in each year: 0 - 30% | 30-50% | >50% of time
4. Indicator 33c - Yellow bars show Peak Week Water Supplied for comparison with Peak Day Water Supplied shown in green.

LEGEND

State Median for all years

Top 20% for 2014-15

PLAN FORM 2 — Plan Drawing only to appear in this space — ePlan

SIGNATURES AND SEALS ONLY.

FOR SIGNATURES, SEALS AND CERTIFICATES SEE SIGNATURES FORM

SURVEYING REGULATION 2001 : CLAUSE 32(2)					
MARK	MGA COORDINATES EASTING	MGA COORDINATES NORTHING	ZONE	CLASS	ORDER
PM55837	269096.516	6062577.567	56	B	2
PM55839	268417.782	6062755.120	56	B	2
PM55840	267880.008	6062649.766	56	B	2
COMBINED SEA LEVEL SCALE FACTOR =1.000252					
SOURCE : MGA COORDINATES ADOPTED FROM LIC DN 29/11/2006					

DIAGRAM NTS — 1 — 16.85 ha

SHORT LINE TABLE		
No	BEARING	DISTANCE
1	88° 00' 08"	117.980
2	78° 51' 19"	202.160

LAND TO BE ACQUIRED — VACANT CROWN LAND — 1 — 16.85 ha

EASEMENT TO BE ACQUIRED

(A) — PROPOSED SEWERAGE EASEMENT 10 WIDE AND VARIABLE WIDTH.

DP1109186

Registered: 8.3.2007 *
Title System: TORRENS, OLD SYSTEM & CROWN LAND
Purpose: ACQUISITION (NOT CURRENT PLAN SEE SECTION 7A, CONVEYANCE ACT 1919)
Ref Maps: WM6805-3 *
Last Plan: DP1063393 & DP255834

PLAN OF

A) LAND TO BE ACQUIRED FOR THE PURPOSES OF THE LOCAL GOVERNMENT ACT 1993.

B) PROPOSED ELECTRICITY EASEMENTS OVER LOT 1 DP1063393.

C) PROPOSED SEWERAGE EASEMENT OVER CLOSED ROAD AND CROWN LAND.

Lengths are in metres. Reduction Ratio 1:3000

LGA: SHOALHAVEN
Locality: ULLADULLA
Parish: ULLADULLA
County: ST VINCENT

This is sheet 1 of my plan in 3 sheets. (Delete if inapplicable)

Surveying Regulation, 2001
I, STEPHEN MICHAEL ROBINSON
of SHOALHAVEN CITY COUNCIL PO BOX 42 NOWRA 2541,
a surveyor registered under the Surveying Act, 2002, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveying
Regulation 2001 and was completed on 29/11/2006
The survey relates to LOT 1 AND PROPOSED EASEMENTS
(Here specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)
(Signature) SEE SIGNATURES FORM
Surveyor registered under the Surveying Act, 2002

Datum line: "X" - "Y"
Type : (Urban/Rural)

Plans used in preparation of survey/compilation
- V5436 2013 DP256334
- V5437 2013 R25342 1605
- DP859363
- V6200 2013
- DP546675
- DP1063393

PANEL FOR USE ONLY. For statements of intention to dedicate public roads or to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

LOT 1 IS TO BE ACQUIRED.

Department of Lands Approval
I, ... is approving this plan certify (Authorised Officer)
that all necessary approvals in regard to the allocation of the land shown hereon have been given.
Signature: SEE SIGNATURES FORM
Date: .....
File Number: .....
Office: .....

Subdivision Certificate
I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been complied with in relation to the proposed
..... ml, ml, ha/sq
(Insert, "subdivision" or "new road")
SEE SIGNATURES FORM
* Authorised Person/General Manager/Accredited Certifier
Consent Authority: .....
Date of endorsement: .....
Accreditation no: .....
Subdivision Certificate no: .....
File no: 21887

Note:
** Where the plan is to be lodged electronically by the Land Titles Office, it should include a signature in an electronic or digital format approved by the Registrar-General.
* Delete whichever is inapplicable.

SURVEYORS REFERENCE SR43-2006

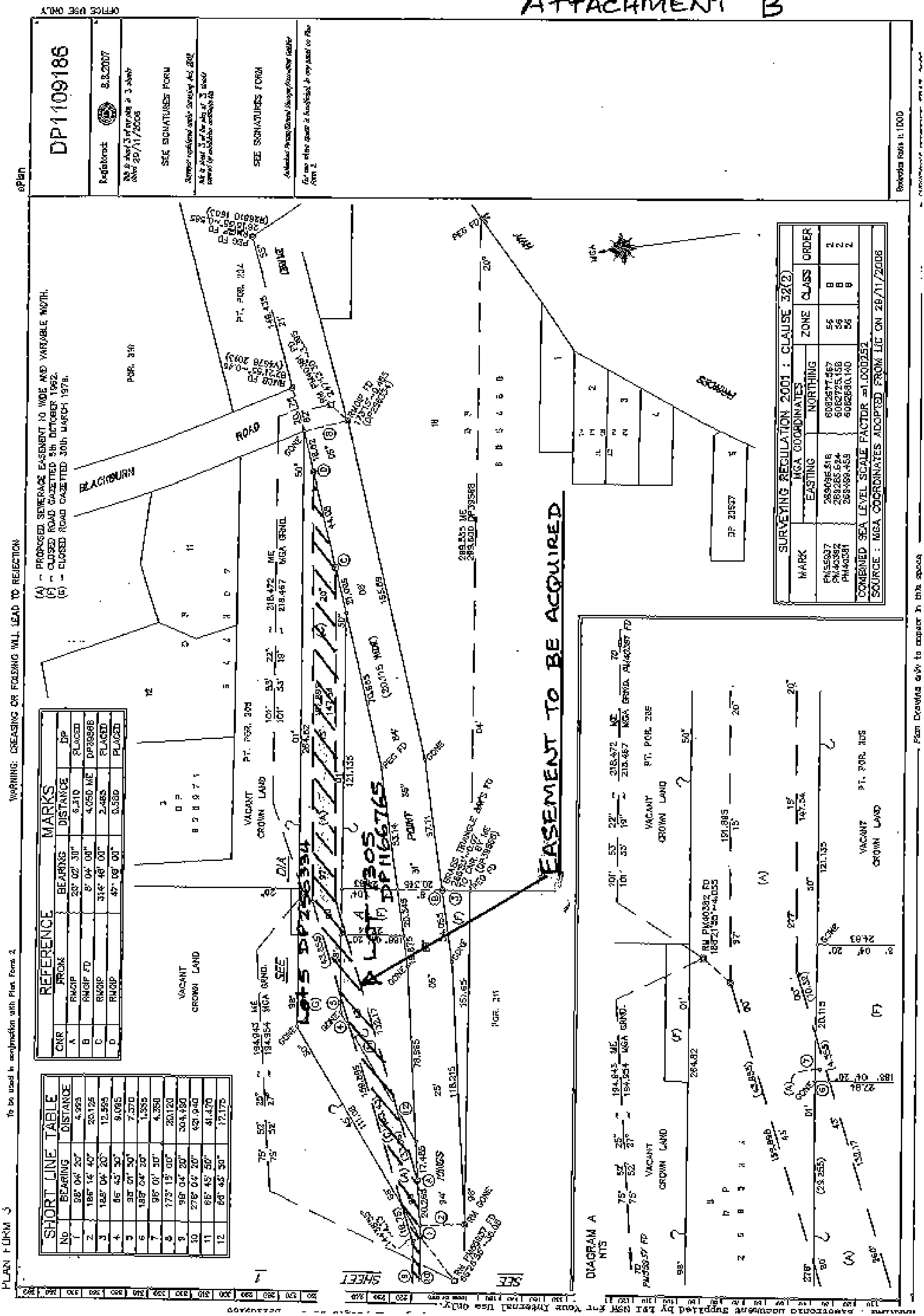
WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

OFFICE USE ONLY

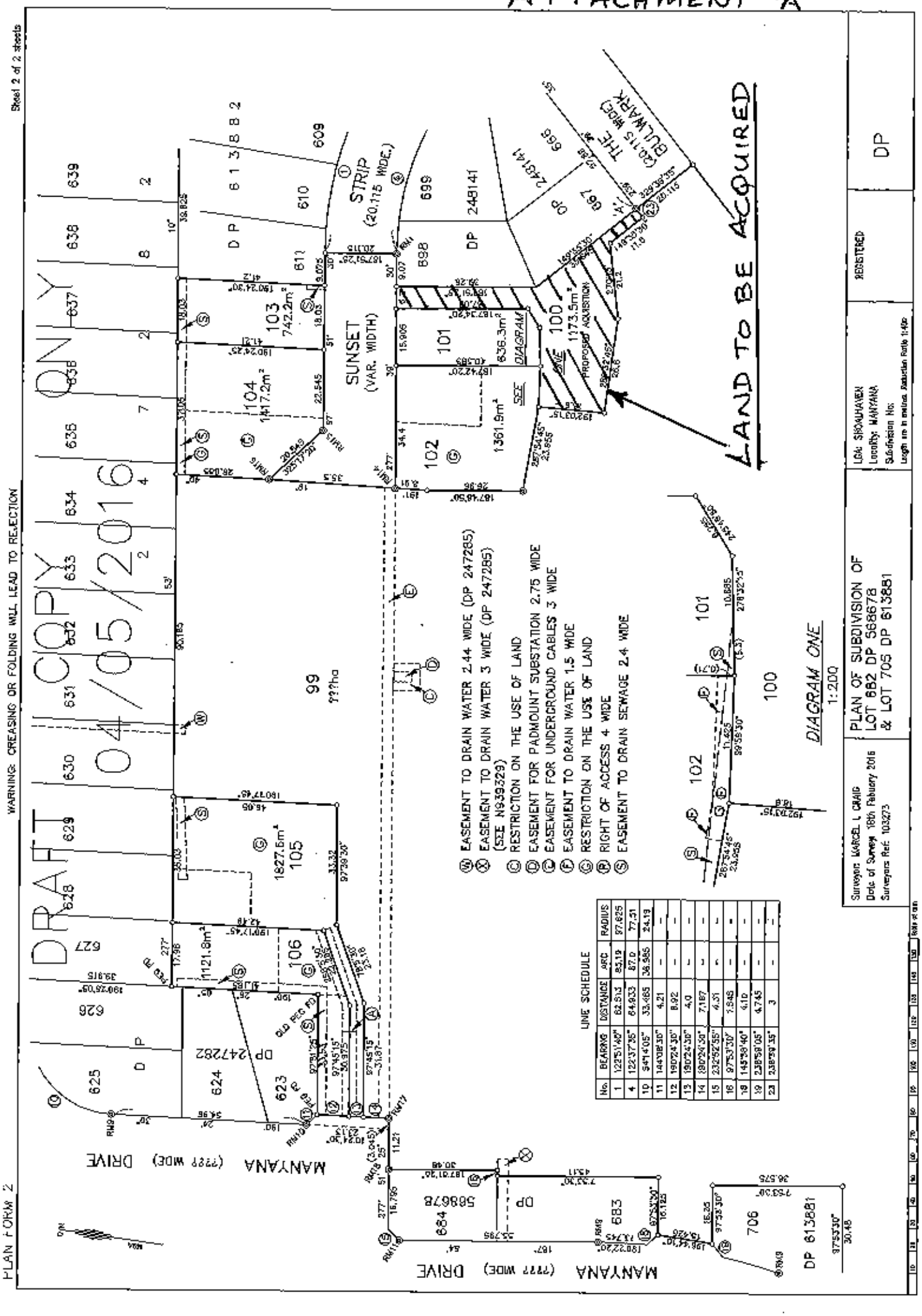
Strategy and Assets Committee-14 June 2016 - Item 14

ATTACHMENT 'A'

ATTACHMENT 'B'



ATTACHMENT 'A'



No.	BEARING	DISTANCE	ARC	RADIUS
1	122°51'40"	82.513	85.19	97.625
4	122°37'35"	64.933	67.0	77.51
10	94°14'05"	33.485	36.985	24.19
11	144°08'35"	4.21	–	–
12	190°24'30"	8.92	–	–
13	190°24'30"	4.0	–	–
14	190°24'30"	7.187	–	–
15	232°52'55"	6.31	–	–
16	97°53'30"	1.845	–	–
18	145°36'40"	4.10	–	–
19	238°59'05"	4.745	–	–
23	338°59'35"	3	–	–

LINE SCHEDULE

Ⓦ Ⓧ EASEMENT TO DRAIN WATER 2.44 WIDE (DP 247285)
EASEMENT TO DRAIN WATER 3 WIDE (DP 247285) (SEE N939329)
Ⓒ RESTRICTION ON THE USE OF LAND
Ⓓ EASEMENT FOR PADMOUNT SUBSTATION 2.75 WIDE
Ⓔ EASEMENT FOR UNDERGROUND CABLES 3 WIDE
Ⓕ EASEMENT TO DRAIN WATER 1.5 WIDE
Ⓖ RESTRICTION ON THE USE OF LAND
Ⓟ RIGHT OF ACCESS 4 WIDE
Ⓢ EASEMENT TO DRAIN SEWAGE 2.4 WIDE