

# Worldwide Water Comparisons 1999-2000

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## **1 Foreword**

This is our fourth report to examine the relative performance of the regulated water and sewerage companies in England and Wales with enterprises in three different countries; Australia, the Netherlands and the United States of America.

Most of the comparative data used in this report comes from published documents. The exceptions are Sydney Water and Water Corporation Western Australia who volunteered to submit data for analysis. I would like to thank both companies for their commitment to this initiative.

This report allows us to set the performance of England and Wales companies in a wider context, comparing them against international best practice. Where such comparisons lead to improved performance, customers benefit.

We are now taking part in a collaborative review, lead by WRc, of the level and scope of benchmarking activity worldwide. This will help us to focus the future direction of our work and, in turn, will benefit both those companies that wish to participate and, ultimately, customers.

**W H Emery**  
**Director of Costs & Performance**  
**and Chief Engineer**

## 2 Summary

Comparing company activities and operational performance helps us to identify the best performers and can provide an incentive for companies to deliver improved services at lower costs. We can also identify poorly performing companies and take steps to secure improvement.

In this report we compare data from a range of overseas enterprises for 1999-2000 with the regulated companies in England and Wales. International data on bills, operating costs and service performance provides us with evidence of whether companies in England and Wales are providing best value for money to their customers.

We concentrate on comparator enterprises from Australia (urban territories), the Netherlands and the US. From these countries we include companies that have, to some extent, a distinct corporate identity, rather than being a consolidated function of local government. Companies in these countries already undertake some benchmarking.

### **Data comparability warning**

The data used in this report for the overseas enterprises come from a variety of sources – mainly trade association publications and annual reports and accounts. Different definitions and assumptions in these sources might mean that information is not completely comparable to that defined in the June Return that the England and Wales companies submit.

**However, we consider the data used in this report are sufficiently comparable to allow us to draw reasonable, generalised conclusions. But we recommend that the reader should be cautious about basing specific regulatory or business decisions on the comparisons in this report (see appendix 1).**

This report uses data for the financial year 1999-2000. The financial year is from April to March in England and Wales, July to June in Australia. The US and the Netherlands report against calendar year. We have used data for the 1999 calendar year.

We have drawn data from a number of key areas. These include unit cost information on the components of customers' bills, water consumption and leakage, and financial indicators. Comparable data describing the quality of customer service and compliance with quality standards is not yet widely available.

This summary outlines the broad conclusions drawn on unit costs, water delivered and leakage and financial ratios. More detailed comparisons, country by country, are set out in four sections; A1 – Sydney Water, A2 – Water Corporation Western Australia, A3 – Other Australian companies, B – the Netherlands, C – US. Section D sets out the purchasing power parity theory.

## Water service unit costs

Unit costs provide us with a general indication of the relative efficiency of companies in delivering the required service to customers. Tables 1 and 2 summarise the unit costs of the water service. The tables set out operating expenditure and capital maintenance charges along with an implied return on capital element (this is calculated as a residual by subtracting the operating expenditure and capital maintenance charges from the turnover for the service).

**Table 1 Costs per unit of water delivered (p/m<sup>3</sup>)**

	England and Wales	Australia*	Netherlands*	US*
Cost of operations	31	21 (25)	47 (56)	27 (28)
Cost of capital maintenance	18	7 (8)	17 (20)	6 (6)
Return on capital	23	14 (18)	12 (14)	21 (23)
Abstraction tax	-	- (-)	7 (9)	- (-)
<b>Total cost</b>	<b>72</b>	<b>42 (51)</b>	<b>83 (99)</b>	<b>54 (57)</b>

\* Weighted average of those companies included in this report (Australian average includes data that Sydney Water and Water Corporation submitted to us rather than data in WSAAfacts). Figures in brackets represent costs adjusted for purchasing power parity theory.

**Table 2 Costs per property of water delivered (£/property)**

	England and Wales	Australia	Netherlands	US
Cost of operations	66	73 (87)	74 (87)	159 (168)
Cost of capital maintenance	38	24 (29)	27 (32)	35 (37)
Return on capital	46	48 (63)	18 (21)	127 (134)
Abstraction tax	-	- (-)	12 (14)	- (-)
<b>Total cost</b>	<b>150</b>	<b>145 (179)</b>	<b>131 (154)</b>	<b>321 (339)</b>

Figures in brackets represent costs adjusted for purchasing power parity theory

Countries with high levels of per capita consumption (pcc) and household demand (the US and Australia) deliver water at an apparently lower cost than their counterparts in Europe. This is because European water use is much lower. Lower volumetric bills in the US and Australia reflect this difference. The extent to which this difference reflects efficiency rather than economies of scale in water distribution and treatment that the higher demand may create is more doubtful.

When we compare Sydney Water and Water Corporation Western Australia to the England and Wales average using our more sophisticated operating cost models, the results are more mixed. However, it is important to remember that we did develop these models with the England and Wales operating environment in mind. The cost drivers that we use in the models may not be as important in Australia as they are in England and Wales.

Costs in the Netherlands appear higher than in England and Wales. The lower return on capital might relate to the fact that state owned enterprises generally return a lower proportion of revenues to the owners of the business. This is because governments can borrow at lower interest rates than private enterprises and there are often no (or at least much lower) dividends paid. The lower return on capital may reflect an element of subsidy in that the providers of capital (i.e. the government) are not earning a market determined return. England and Wales return on capital includes company out-performance of efficiency assumptions.

Comparing unit costs (Table 2) in terms of properties served, rather than on a water-delivered basis, paints a different picture. While some companies, notably the Melbourne retail companies South East Water Limited and Yarra Valley, still appear more efficient than England and Wales most exhibit total unit costs more in line with the England and Wales average. This implies a similar level of absolute cost efficiency. The US is the exception; its costs are significantly higher. The US data suggests that the extremely high level of household demand is the main driver for the higher implied household bill.

### Sewerage service unit costs

Sewerage service comparisons also suggest that because of the higher volume collected per head Australia has much lower unit costs (Table 3).

**Table 3 Costs per unit of sewage collected (p/m<sup>3</sup>)**

	England and Wales	Australia	Netherlands*	US*
Cost of operations	28	25 (27)		
Cost of capital maintenance	24	14 (14)		
Return on capital	45	22 (23)		
<b>Total cost</b>	<b>97</b>	<b>61 (64)</b>		

\*Only data for the water service is available for the Netherlands and US. Figures in brackets represent costs adjusted for purchasing power parity theory

However, the key service provided is the removal, treatment and disposal of sewage (including surface water in combined sewer systems). Because this depends more on the size of the population and differences in treatment standards than on the volume of waste collected, per property comparisons are therefore more meaningful than volumetric comparisons.

The sewerage service per property unit cost (Table 4) suggests that costs for England and Wales and Australia are similar. Operating expenditure in England and Wales is lower, but capital maintenance charges are higher. However, it is clear that the level of treatment varies significantly between companies and, as a result, we would expect some difference in unit costs.

**Table 4 Costs per property for sewage collected (£/property)**

	England and Wales	Australia	Netherlands*	US*
Cost of operations	50	66 ( 81)		
Cost of capital maintenance	42	35 (44)		
Return on capital	80	56 (70)		
<b>Total cost</b>	<b>172</b>	<b>157 (195)</b>		

\*Only data for the water service is available for the Netherlands and US. Figures in brackets represent costs adjusted for purchasing power parity theory

### **Purchasing power parity unit costs**

This report uses average exchange rates over the year (see Table 8). But even these average exchange rates may not provide a true reflection of costs. Currency movements can have a major impact on reported costs which can, in turn, influence unit costs. Fluctuations will affect per property unit costs more than water delivered unit costs because of the relatively smaller denominator. Similarly, the impact of currency movement will be greater for smaller (in terms of lower number of properties/amount of water delivered) companies.

We considered the influence of exchange rates on costs by applying purchasing power parity theory (PPP). Tables 1 to 4 include the PPP adjusted unit costs. PPP removes the impact of fluctuations in exchange rates, allowing us to compare costs with greater confidence. PPP water delivered costs suggests that while Australian and US costs are lower than England and Wales, the Netherlands costs are higher. On a PPP per property basis, costs are similar across countries with the exception of the US.

Applying PPP to sewerage costs suggests that, on a volumetric basis, the gap between England and Wales and Australia is smaller. On a per property basis PPP suggests Australian costs are higher.

### **Water delivered and leakage**

Because water delivered influences costs, it is important for us to have an accurate understanding of the components of the water balance. Comparison of elements of the water balance (Table 5) uncovers some striking differences. As shown in previous reports, pcc for Australia is almost 90% higher than England and Wales, while the US is close to three times higher.

**Table 5 Water delivered, leakage and consumption**

	England and Wales	Australia	Netherlands	US
Distribution input (l/prop/d)	646	1101	456	1968
Distribution losses (l/prop/d)	105	110	-	341
Measured households consumption (l/head/d)	137	256	-	451
Unmeasured households consumption (l/head/d)	151	-	-	-
Household meter penetration (%)	17	100	100	100

The Organisation for Economic Co-operation and Development (OECD) publication 'The price of water – Trends in OECD countries' places both Australia and the US (along with Canada and Japan) within a high use (>250l/head/d) category. The UK as a whole, on the other hand, is alongside Finland and Switzerland in the middle range (130-190 l/head/d) category. Greater use of water intensive equipment, such as swimming pools, and garden use in a hotter, drier climate may help explain some of this difference. Indeed, comparison of external water use (Table 6) clearly illustrates this as one likely source of variation.

**Table 6 External water use in selected countries**

Country	Percentage household water used externally
England and Wales	3
Australia	34
US	58
Finland	2
Switzerland	2

High meter penetration in comparator countries should provide more reliable estimates of the water balance than is currently possible in England and Wales. A number of factors can influence system losses; for example, reducing pressure can lead to lower leakage. US leakage appears unusually high. If higher pressure exists in the US this might partly explain the apparently high levels of system losses. The Netherlands reports very low levels of leakage. It is likely that this reflects different assumptions and operating conditions.

We must remember that the water balance is complicated to assess – different data assumptions and inconsistencies can influence the final figures.

## Financial performance

Companies in England and Wales are privately owned (as are the US companies sampled), and must pay dividends to shareholders. In most other countries, the enterprises are state owned and rely largely on debt finance. Accounting approaches vary between countries. This is evident in the way that:

- businesses are valued;
- long-lived assets are treated; and
- depreciation is calculated.

England and Wales and Australia tend to use current cost accounting. In these countries, depreciation relates to the current replacement cost of assets. The Netherlands and the US use an historic cost approach. In this case assets are valued with reference to the purchase price, regardless of the passing of time and the level of associated inflation.

In England and Wales, the first 200-day average of market capitalisation, plus debt, less any cash injection, was the basis for the capital value of the 10 water and sewerage companies. An assessed indicative value was the basis of the water only companies' initial capital values. In Australia, the data reported in the annual accounts relate to the current replacement cost of the asset.

**Table 7 Financial Indicators**

	England and Wales	Australia	Netherlands	US
Estimated capital employed				
Water service (£/prop)	-		436	1,203
Sewerage service (£/prop)	-			
Water & sewerage (£/prop)	1,241*			
Net replacement cost (MEA)				
Water & sewerage (£/prop)	8,908*	2,883	n/a	n/a
Historic cost dividend cover	1.7	n/a	No dividends	1.6
Current cost dividend cover	1.6	1.0	n/a	n/a
Dividend + interest / capital employed (%)	7	3	4	5
Historic cost – interest cover	4.1		1.4	3.3
Current cost – interest cover	3.5	3.7		
Return on capital (estimated capital employed) (%)	9.3	n/a	6.1	9.8
Return on capital (MEA) (%)	1.3	4	n/a	n/a
Operating margin (%)	36	37	20	37

\*Water and sewerage companies only

Table 7 sets out certain key financial ratios. It shows that estimates of the capital base vary markedly. US companies quote a value per property for the water service only that is almost as high as the combined water and sewerage service for England and Wales. Estimates of current replacement costs also vary. England and Wales companies cite a very high figure compared to Australia.

In the Netherlands and Australia a number of businesses do not pay dividends. Those in the US and Australia that do appear to pay quite high dividends and interest payments relative to their capital base and profits when compared to England and Wales.

Neither the reported return on capital nor operating margin of the England and Wales companies seem out of line with the private sector companies in the US. State-owned enterprises appear to earn a lower profit margin. Generally public sector companies can support much lower levels of interest cover than private sector lenders would tolerate. The public-owned companies in the Netherlands appear to support this.

## **Capital maintenance study**

Last year's report appeared to suggest that the level of capital maintenance expenditure was lower in the comparator countries than in England and Wales. As a result, we commissioned W S Atkins to undertake a study of the level of, and influences on, capital maintenance in the comparator companies. The report will be published shortly.

Broadly, it suggests that differences in capital maintenance expenditure can be related to differing asset valuations, accounting methods and assumptions and the allocation of infrastructure renewal accounts. The study did not uncover evidence to suggest that these lower levels reflected lower levels of capital maintenance activity or lower levels of service. This study shows how indicative benchmarking such as this report can form the basis of further, more detailed investigation.

## **Conclusions**

- Unit costs in Australia and the US are lower, on a water delivered basis. This may reflect the higher demand of consumers.
- Per property unit cost comparisons reduce the apparent 'performance gap' between England and Wales and Australia and the US.
- Adjusting for purchasing power parity (PPP) suggests that a significant portion of the difference in unit costs relates to exchange rates.
- Water consumption is much higher in the US and Australia than England and Wales. Much of this appears to relate to the large proportion of water used outside of the house.
- Leakage in the Netherlands is lower than England and Wales. Recent work suggests a number of operational and geographical differences may explain this.
- Financial ratios of England and Wales are broadly similar to private companies in the US.

### 3 International comparisons strategy

Comparative competition has served customers well. It has delivered improved services at lower costs and enabled the identification of poorly performing companies. It formed a central part of the 1999 periodic review of price limits.

It has been used externally by the Water Industry Commissioner for Scotland as the basis of his Strategic Review of Charges for the Scottish Water Authorities.

We use comparative information in four main areas to compare and contrast:

- prices, bills and tariffs;
- service levels and quality compliance;
- operational costs and performance (including leakage); and
- relative efficiency.

As part of our continuing commitment to comparative competition, we looked at the options for extending its boundaries. We see our work developing international comparators as an extension of comparative competition. The extent to which we can use this work varies with the quality of the comparative data that we obtain. We believe the results can be used in four ways.

- **Context setting.** The data are not very robust and can only be used to put the regulated companies' performance into an appropriate wider context in public and political settings.
- **Challenging.** Data are not fully comparable but do expose differences that challenge the current performance levels of the regulated companies.
- **Reinforcing.** Data are robust enough to be used as additional support to regulatory decisions.
- **Benchmarking.** Data are robust, identifying a new benchmark to be used in regulatory decisions.

We developed the work both by taking advantage of opportunities as they arose to make comparisons with other water enterprises and by actively promoting further water enterprise comparisons. This year we have commissioned an audit of the level of benchmarking activity that is already underway around the world.

We believe that the work that we have undertaken in the past three years has been successful. We have improved the scope of our comparisons (as this report demonstrates) and been able to show how the improved level of knowledge can benefit our local regulatory regime. We believe that this work should continue.

We will continue to seek comparator enterprises and invest in the acquisition of robust data for use in reports and regulatory decision making. We intend to build on the robust comparisons established in Australia. We will continue to help Water Services Northern Ireland to produce robust and comparable data and contribute to the work of the Water Industry Commissioner for Scotland.

We will continue to offer to share with partners the results of our full comparative analysis including, whenever possible, a comparative assessment of relative performance. We meet and discuss our work in this area with overseas visitors on a regular basis.

We will consider further how far international comparisons offer the prospect of developing worthwhile direct comparators with the water companies of England and Wales. At the last price review, we told the companies that we expected them to have used benchmarking to put their own costs and services in a realistic context. This remains our stance.

## **4 Comparisons of performance**

### **Introduction**

Sydney Water and Water Corporation of Western Australia submitted data, as a slimmed down June Return, directly to us. These submissions meant that we could compare performance across six key areas:

### **Customer service levels**

In England and Wales we assess levels of customer service against indicators that cover a range of customer related aspects of service performance.

We publish the results, as DG indicators, each year so that any customer can see how well their company is performing (see appendix 2 for details).

Water Corporation also agreed to a comparison against the overall performance assessment (OPA) developed prior to the 1999 review of prices. Further details are in appendix 3.

### **Water delivered, leakage and consumption**

This assessment is important both in terms of assessing relative efficiency and deciding whether a company is using its water resources effectively. We publish details of England and Wales companies' water balance and levels of leakage each year.

The assumptions we make when estimating components of the water balance can significantly influence outputs such as unit costs.

### **Unit cost comparisons**

Unit cost comparisons provide a simple indicator of relative cost performance. We express costs on the basis of cost per cubic metre of water delivered/sewage collected and cost per property billed.

We divide overall unit costs into costs of operations, maintenance and servicing capital. Where possible, we separate the cost of operations into functional areas of expenditure. Unit costs are not in themselves measures of efficiency, as costs may vary due to conditions outside a company's control.

### **Econometric models**

High and low costs do not always directly reflect relative efficiencies. High cost companies may operate in particularly unfavourable conditions. Unit cost comparisons do not take into account factors relating to the operating environment, which might increase or reduce costs relative to other businesses.

Because of this we use statistical techniques, combined with assessments of company-specific factors, to identify the relative efficiencies of England and Wales companies.

We publish the overall efficiency of companies against these models each year alongside the unit costs. We applied these models to Sydney Water and Water Corporation costs where appropriate. See appendix 4 for details of the models.

### **Capital expenditure**

This provides an indication of the expenditure on maintaining and enhancing service delivery. Legislative requirements are likely to significantly affect expenditure profiles.

### **Financial performance**

Publishing details of companies' financial position and performance is an important component of regulation in England and Wales. Comparing the financial performance of England and Wales companies to organisations subject to other regimes provides an interesting contrast.

To reflect Sydney Water's ongoing involvement in this report, where possible we include data from previous years. In Water Corporation's case its previous submission is not included.

We must view any trends cautiously, because it is difficult to separate real changes in performance from improvements in data accuracy and data compatibility. Neither Sydney Water nor Water Corporation developed their accounting systems with our reporting requirements in mind.

Their submissions will include a greater degree of apportionment between services and lines than England and Wales companies. Table 8 summarises the exchange rates used within this report.

**Table 8 Summary of information sources and other assumptions**

Country	Companies	Source of data	Financial year	Exchange rate per £
England and Wales		June Return 1999	4/99 – 3/00	-
Australia	Sydney Water Water Corporation	Submission to Ofwat WSAAfacts	7/99 – 6/00	AU\$2.47
Australia	Brisbane Water CityWest Water Gold Coast Water South Australia Water Corporation South East Water Limited Yarra Valley Water	WSAAfacts	7/99 – 6/00	AU\$2.47
Netherlands	Duinwaterbedrijf Zuid-Holland Gemeentewaterleidingen PWN Waterleidingbedrijf Waterbedrijf Gelderland Waterleiding Maatschappij Limburg Waterleidingbedrijf Midden-Nederland Waterleiding Maatschappij Overijssel Waterleidingmaatschappij Oost-Braban	Arthur D Little benchmarking study for VEWIN and annual accounts	1999 (calendar year)	NLG3.625
US	California Water Service Company Indianapolis Water Company New Jersey-American Water Company Penn American Philadelphia Suburban Water Company San Jose Water Company Southern California St Louis County Water Company	NAWC Financial and Operating Data	1999 (calendar year)	US\$1.618

## **Section A – Australia**

### **Constitutional and regulatory framework**

Australia adopts a generally similar regulatory framework to the UK, Water Corporation has a 'cost linked' (rate of return) style pricing. Public bodies exist to regulate drinking water standards and environmental concerns.

Each state is responsible for regulating the water sector. The exact nature of the sector varies from vertically integrated organisations to separate entities undertaking the wholesale and the distribution/retail functions.

### **A1 Sydney Water**

#### **Regulatory bodies**

Sydney Water Corporation is an unlisted public company formed in 1995 from the previous public water board. The New South Wales government remains the owner.

The Department of Land and Water Conservation considers water resources while the Health Department considers water quality. The Environment Protection Authority consider environmental concerns while the Independent Pricing and Regulatory Tribunal (IPART) and the licence regulator consider economic and customer service regulation.

#### **Data sources**

Sydney Water submitted data directly to us in the form of a slimmed-down June Return. The June Return contains additional data to that available for the other Australian comparators in this report.

Sydney Water did not employ Reporters to audit its return this year. However, its data should be of a robust standard because it has undergone audits in previous years and now has a better understanding of our definitions.

A small amount of additional data comes from the Water Services Association of Australia publication, WSAAfacts 2000.

## Customer service levels

Table 9 compares the customer service performance of Sydney Water with the England and Wales companies from 1997-2000. Appendix 2 describes the DG indicators in more detail.

**Table 9 Performance against DG levels of service indicators**

	England and Wales						Sydney Water			
	average			range						
	1997-98	1998-99	1999-00	1997-98	1998-99	1999-00	1997-98	1998-99	1999-00	
<b>DG2</b> Properties at risk of low pressure (%)	0.25	0.17	0.13	0-3.38	0-3.47	0-1.46	0.34	0.25	0.41	
<b>DG3</b> Properties subject to unplanned supply interruptions	>12 hours (%)	0.15	0.05	0.06	0.0-1.29	0-0.24	0-1.51	0.05	0.04	0.03
	> 6 hours (%)	0.53	0.33	0.36	0.01-1.4	0-0.99	0-1.80	0.42	0.40	0.64
<b>DG5</b> Properties subject to flooding incidents (per 100,000 properties)	overloaded sewer flooding	15.7	9.4	16.9	4.6-36.1	1.3-16.8	7.7-33.5	2.9	2.9	0.5
	'other causes'	16.6	14.0	14.9	7.9-25.9	7.7-22.7	5.1-20.5	6.4	6.2	7.6
<b>DG6</b> Billing contacts not responded to within five working days (%)	4.7	2.5	1.5	0.3-19.8	0-6.0	0-4.1	n/a	n/a	n/a	
<b>DG7</b> Written complaints not responded to within 10 working days (%)	2.0	1.3	0.6	0-9.1	0-4.7	0-6.6	1.0	0.7	1.1	
<b>DG8</b> Bills not based on meter readings (metered properties) (%)	0.9	0.3	0.3	0-3.3	0-1.0	0-0.5	0.1	<0.1	0.0	
<b>DG9</b> Received telephone calls not answered within 30 seconds (%)	19	10	9	2-53	2-17	2-31	39	30.3	29.5	

## **DG2 Inadequate pressure**

Sydney Water must provide 15 metres head of pressure in the water main adjacent to the property, which is roughly equivalent to the standard for England and Wales. Sydney clearly meets the standard in its operating licence (maintaining this pressure for 98% of households within a year) although its performance is slightly worse than last year. Its performance is very close to the average for England and Wales, although England and Wales companies improved slightly. The performance of England and Wales has improved consistently over the past three years.

## **DG3 Supply interruptions**

Companies in England and Wales must report unplanned interruptions of 6, 12 and 24 hours. Sydney Water's performance against the 12 hour standard is broadly equivalent to the England and Wales average for 1999-2000, improving slightly on last year. Sydney Water's performance against the 6 hour standard is below average, showing a slight decrease in performance on last year. This decrease relates to four specific incidents located at critical locations on the network. Using our methodology for assessing performance across the 6, 12 and 24 hour standards, Sydney Water achieves an 'acceptable' rating.

## **DG 5 Foul sewer flooding**

Sydney Water cannot easily separate incidents of internal and external flooding of customer property reducing confidence in the data. Despite this, the data suggests that Sydney Water's sewerage network is as reliable (in terms of preventing internal flooding) as the better England and Wales companies. Sydney Water achieves an 'above average' rating for flooding due to overloaded sewers (0.05 per 100,000 customers compared to an England and Wales average of 16.9) and 'other causes' (7.5 per 100,000 customers compared to an England and Wales average of 14.9).

Only two England and Wales companies achieve a better performance for overloaded sewers. One achieves a better rate than Sydney Water for 'other causes'. Its performance for overloaded sewers shows a marked improvement on previous years compared to a less consistent picture in England and Wales.

Two particular aspects of the operating environment help explain the low levels of flooding. Firstly, separate wastewater and storm water systems, which help mitigate the impact of heavy rainfall, are commonplace in Australia. In England and Wales combined systems are much more common. Secondly, the use of gullies on private sewer mains, which act as an overflow point during potential flooding incidents, reduces the risk of internal flooding compared to England and Wales.

## **DG6 Response to billing queries**

Sydney Water does not monitor response times to billing queries in a formal way and, consequently, comparative data is not available.

## **DG7 Response to written complaints**

DG7 assesses companies against two sets of criteria, responses within 10 days and responses that take longer than 20 days. Sydney Water achieved a good assessment (98.9% and 0.22%). The worst England and Wales company achieved 93.4% and 2.54%. The industry average is 99.4% and 0.11%. The England and Wales average has shown a steady improvement over the past three years, compared to a slight decrease in Sydney Water's performance. However, the England and Wales average does mask movement by individual companies similar to Sydney Water.

Sydney Water receives a very low number of written complaints compared to England and Wales companies of similar size.

Generally, written complaints sent to Sydney Water tend to be more serious. It resolves most complaints within two days over the telephone. The company tends to send a 'holding' reply to written complaints; the final resolution of the issue often takes longer.

This contrasts with the UK where customers are much more likely to make a written complaint. Indeed, Sydney Water receives 0.3 written complaints per 1,000 connections compared to 5.2 in England and Wales. It is not possible to distinguish the extent to which this relates to cultural differences rather than greater satisfaction with performance.

## **DG8 Meter reading**

Over 98% of the properties Sydney Water serves have meters installed, many more than the England and Wales average. The company reads meters quarterly. Previous performance was to a high standard with less than 0.1% of meters being unread in 1998-99 compared to 0.3% in England and Wales. Sydney Water continues its good performance and indeed improves upon last year. Its performance achieves a good rating under our assessment equalling the best performance in England and Wales.

## **DG9 Telephone contact**

Sydney Water is restructuring its telephone services with the aim of improving the service it offers its customers. It notes that new water efficiency campaigns and a year 2000 malfunction have increased the scope of areas dealt with by the call centres although the number of contacts, in absolute terms, appears to be lower than last year.

Sydney Water's performance against our measure of calls answered within 30 seconds shows continuing improvement from 1997-98 (61%) and 1998-99 (70.5%) but is still rated as needing improvement.

The poorest performer in England and Wales answered 68.6% of received calls in 30 seconds, the next closest achieved 87.1%. The standard that needs to be achieved to receive an 'acceptable' rating is 86%

## Volume of water delivered and leakage

Table 10 sets out the key parameters for water use.

The most obvious difference is that Sydney Water's pcc and distribution input is much higher than England and Wales.

Sydney Water has significant demand management obligations under its licence.

It had to reduce the quantity of water drawn from all storage, on a per capita basis, by at least 25% between 1990-91 and the year 2000-01, and by 35% per capita between 1990-91 and 2010-11.

Sydney Water's recent pricing tribunal noted that leakage reduction needed to play an important role in this strategy.

**Table 10 Water delivered, leakage and consumption**

	England and Wales average			Sydney Water		
	1997-98	1998-99	1999-00	1997-98	1998-99	1999-00
Distribution input (l/prop/day)	685	654	646	1,207	1,144	1125
Distribution losses (l/prop/day)	129	113	105	138	138	122
Total leakage (l/prop/day)	174	154	143	138	138	122
Proportion of water delivered to non-households (%)	32	32	32	35	36	36
Measured household consumption(l/head/day)	138	136	137	269	249	248
Unmeasured households consumption(l/head /day)	150	148	151	214	-	253
Average household consumption(l/head/day)	149	146	149	269	249	248

The water balance calculation is easier in Sydney Water than in England and Wales. This is because the large proportion of metered properties, both household and non-household, allows the company to measure more components directly.

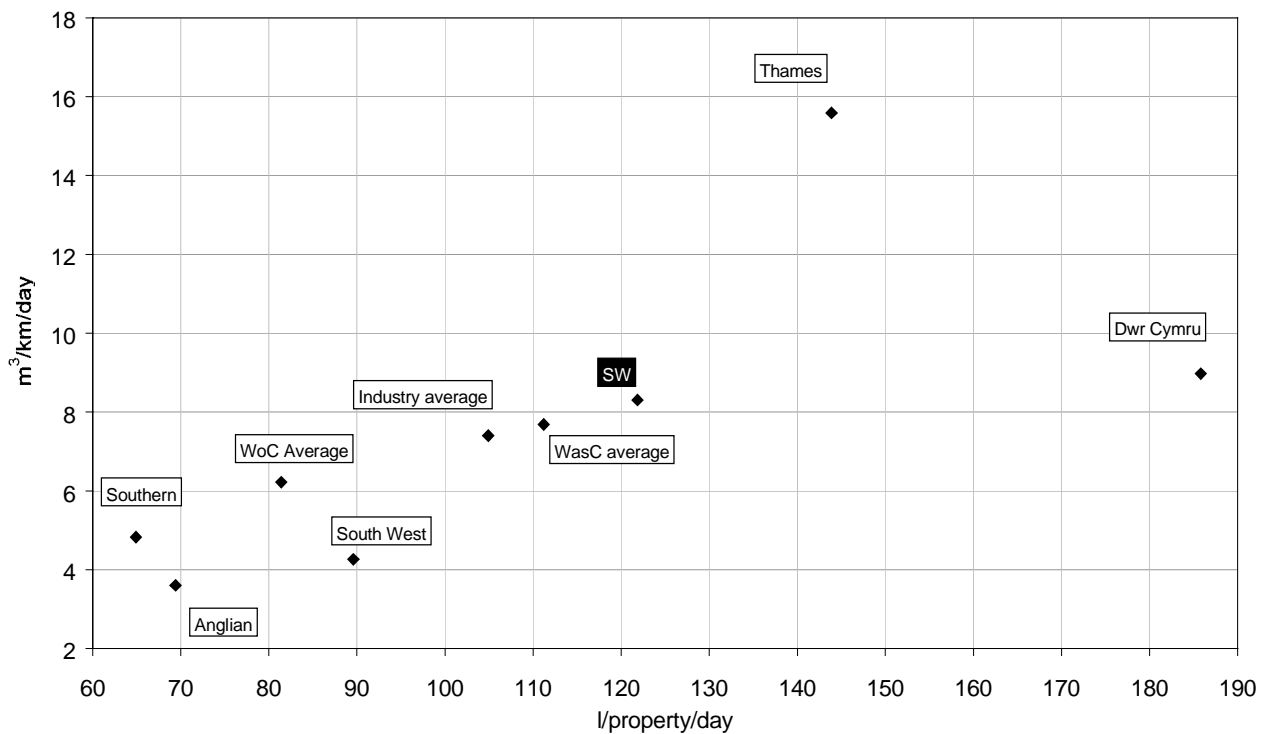
Sydney Water's total leakage is difficult to compare directly to England and Wales because Sydney Water does not quote figures for supply pipe leakage.

In contrast to England and Wales, companies install all meters externally at the property boundary.

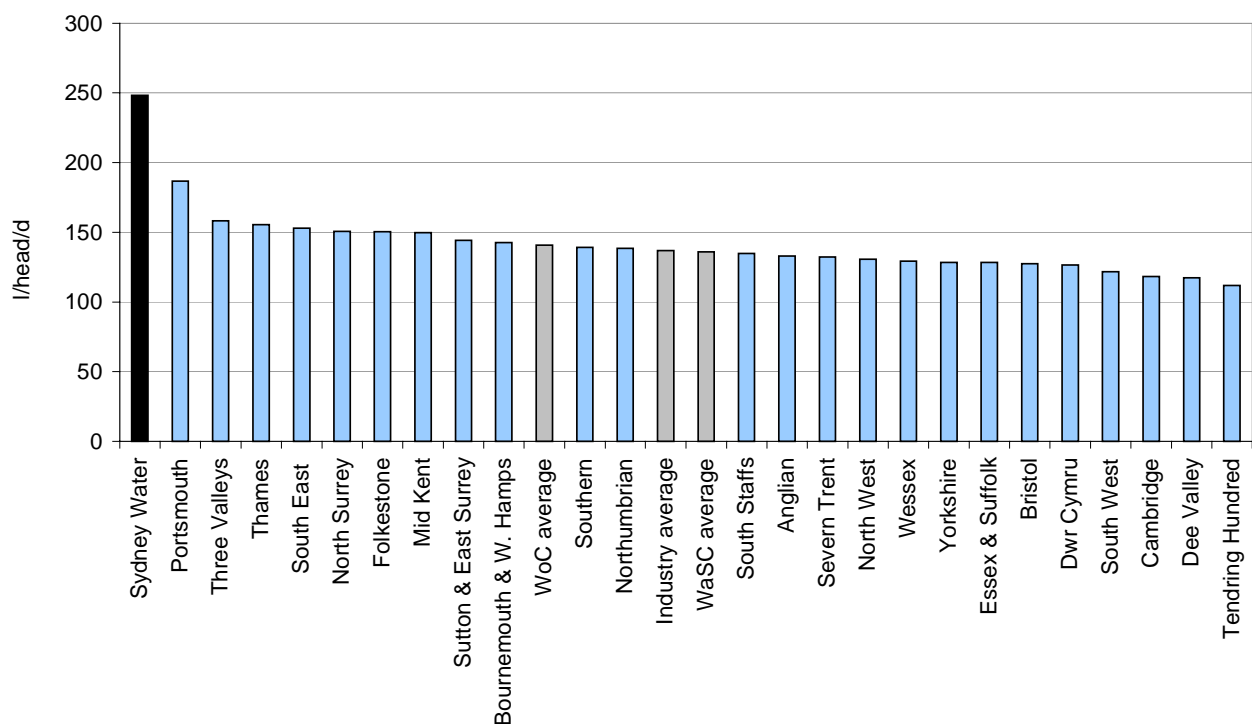
All the water that reaches the customer's external meter counts as water delivered. Sydney Water bills the customer for this and does not, therefore, make an estimate of leakage from supply pipes.

Despite this we can compare distribution losses (Figure 1). Sydney Water's performance compares well with the average of companies in England and Wales. If Sydney Water supply pipe leakage is zero, or close to it, then it fairs very well compared to the best performing companies in England and Wales, in terms of total leakage. Total leakage, in megalitres per day, decreased from 196 last year to 177 in 1999-2000, reversing a slight increase from 1997-98. Sydney Water measured pcc is higher than in England and Wales (Figure 2). Under its assumptions, pcc includes supply pipe leakage (although the company believes this form of leakage is negligible).

**Figure 1: Distribution losses - Sydney Water vs England and Wales**



**Figure 2: Measured pcc**



## Operating expenditure

Tables 11 to 14 set out a simple analysis of unit operating, capital maintenance and return on capital costs. Unit cost comparisons provide a simple indicator of relative cost performance.

### Water unit cost comparisons

Sydney Water's operating costs, in terms of water delivered, are in line with the England and Wales average. These costs are higher than reported in previous reports (Table 11). The increase in water resources and treatment expenditure relates to the creation of the Sydney Catchment Authority (SCA). SCA took over responsibility for catchment management and bulk water provision from Sydney Water, charging Sydney Water for bulk supplies.

**Table 11 Costs per unit of water delivered (p/m<sup>3</sup>)**

	England and Wales 1999-00		Sydney Water		
	average	range	1997-98	1998-99	1999-00
<b>Cost of operations</b>	<b>31</b>	<b>24-52</b>	<b>25(20)</b>	<b>32 (28)</b>	<b>32 (28)</b>
Resources and treatment	10	6-19	11 (6)	10 (6)	17 (13)
Distribution	11	8-22	11 (11)	10 (10)	11 (11)
Business activity	11	7-15	4 (4)	11 (11)	5 (5)
<b>Cost of capital maintenance</b>	<b>18</b>	<b>9-26</b>	<b>5 (7)</b>	<b>5 (7)</b>	<b>4(6)</b>
<b>Return on capital</b>	<b>23</b>	<b>11-54</b>	<b>10 (13)</b>	<b>n/a (2)</b>	<b>5 (8)</b>
<b>Total cost</b>	<b>72</b>	<b>48-128</b>	<b>40 (40)</b>	<b>37 (37)</b>	<b>41 (41)</b>

Data for the England and Wales range column is not additive

**Table 12 Costs per property of water delivered (£/ property)**

	England and Wales 1999-00		Sydney Water		
	average	range	1997-98	1998-99	1999-00
<b>Cost of operations</b>	<b>66</b>	<b>50-88</b>	<b>98 (80)</b>	<b>119 (103)</b>	<b>118 (101)</b>
Resources and treatment	20	13-40	42(24)	39 (23)	63 (46)
Distribution	23	17-33	41(41)	38 (38)	39 (39)
Business activity	22	15-29	15(15)	42 (42)	17 (17)
<b>Cost of capital maintenance</b>	<b>38</b>	<b>18-52</b>	<b>21 (28)</b>	<b>20 (26)</b>	<b>16 (23)</b>
<b>Return on capital</b>	<b>46</b>	<b>21-76</b>	<b>38 (50)</b>	<b>n/a (7)</b>	<b>18 (28)</b>
<b>Total cost</b>	<b>150</b>	<b>100-181</b>	<b>158 (158)</b>	<b>136 (136)</b>	<b>152 (152)</b>

Data for the England and Wales range column is not additive

Cost per property provides a useful comparison that strips out the effect of demand on unit costs. On this basis, Sydney Water water unit costs appear much higher than the average for England and Wales (Table 12). Again the resource and treatment costs category shows an increase this year, reflecting the purchase of bulk supplies from SCA. In contrast, capital maintenance costs are well below England and Wales average and, indeed, lower than last year.

Sydney Water contracts out the operation and maintenance of its treatment works. The costs of this contract are included in Sydney Water's operating costs. The contract includes provision for the renewal of capital equipment that leads to an overstatement of operating costs and understatement of capital maintenance. The figures in brackets reflect the reallocation of the capital maintenance and return on capital costs of the contract from the operating expenditure.

### Sewerage unit costs comparisons

Tables 13 and 14 suggest Sydney Water's overall cost to the customer for sewerage services is broadly similar to England and Wales; the higher total operating costs balance the lower capital maintenance costs. On a per property basis, Sydney Water appears relatively less efficient than on a water delivered basis. Indeed, capital maintenance, on a per property basis, appears to be in line with England and Wales.

**Table 13 Costs per unit of sewage collected (p/m<sup>3</sup>)**

	England and Wales 1999-00		Sydney Water		
	average	range	1997-98	1998-99	1999-00
<b>Cost of operations</b>	<b>28</b>	<b>21-42</b>	<b>38</b>	<b>38</b>	<b>39</b>
Sewerage	5	3-10	13	13	14
Sewage treatment	9	6-17	14	14	16
Sludge disposal	5	3-9	5	5	5
Business activity	9	7-13	5	6	4
<b>Cost of capital maintenance</b>	<b>24</b>	<b>17-33</b>	<b>15</b>	<b>15</b>	<b>16</b>
<b>Return on capital</b>	<b>45</b>	<b>26-103</b>	<b>17</b>	<b>6</b>	<b>8</b>
<b>Total cost</b>	<b>97</b>	<b>63-178</b>	<b>70</b>	<b>59</b>	<b>63</b>

Data for the England and Wales range column is not additive

**Table 14 Costs per property for sewage collected (£/ prop)**

	England and Wales 1999-00		Sydney Water		
	average	range	1997-98	1998-99	1999-00
<b>Cost of operations</b>	<b>50</b>	<b>42-65</b>	<b>104</b>	<b>98</b>	<b>97</b>
Sewerage	9	6-17	37	34	34
Sewage treatment	16	12-26	39	36	39
Sludge disposal	10	6-14	13	12	12
Business activity	15	12-22	14	16	11
<b>Cost of capital maintenance</b>	<b>42</b>	<b>34-58</b>	<b>43</b>	<b>40</b>	<b>40</b>
<b>Return on capital</b>	<b>80</b>	<b>50-159</b>	<b>48</b>	<b>14</b>	<b>21</b>
<b>Total cost</b>	<b>172</b>	<b>128-275</b>	<b>194</b>	<b>152</b>	<b>157</b>

Note. Data for the England and Wales range column is not additive.

## Econometric Models

Within the constraints of this study, sufficient data was only available to run econometric models for water service operating expenditure and capital maintenance. Sewerage service modelling requires additional information outside of the June Return information submission. Further details of the models and explanatory factors are in appendix 4.

Sydney Water is Band E for the combined water model. It has a much lower number of sources than England and Wales companies. The resources and treatment model takes into account economies of scale at the source level (costs will be lower if fewer sources are used). Sydney Water's small number of sources does not explain its high costs. It is not easy to translate the costs associated with the purchase of water from the SCA to the operating environment in England and Wales. They might be similar to Environment Agency abstraction charges. If this were the case, it would not be reasonable to model them. Instead, if they were outside of the company's control, we would either quantify and remove the costs before modelling or treat the costs as a special factor.

Despite this complicating factor, Sydney Water's performance, in terms of efficiency banding, would not change because of the large impact of the low number of sources.

The distribution model suggests below average efficiency for Sydney Water mainly due to the low winter population in relation to modelled opex.

Sydney Water does perform well on the power model, showing particularly low average pumping head (aph) for the level of distribution input pumped. For most companies, power expenditure is almost entirely for pumping, although there are some water treatment processes which are energy intensive.

The model takes the effects of terrain into account (companies in hilly areas will require more power to move water around), and the significant economies of scale associated with high power consumption. The reported opex is low compared to England and Wales companies with a similar aph. Only 2% of Sydney Water modelled opex is power compared to an average of 10% in England and Wales.

We adjust the results for the England and Wales companies for special factors and non-econometric adjustments. We also remove certain atypicals from costs. However, we have not adjusted the Sydney Water results for such factors. It may be that, in reality, certain special factor adjustments to the Sydney Water result might be appropriate and might explain the banding for the overall model. The special factors accepted for some companies are in appendix 4.

Sydney Water costs come out below those expected for all elements of the capital maintenance water model. Not surprisingly, it also comes out well below predicted costs for overall expenditure. The unit cost comparisons appear to support this higher efficiency. However, it might also mean that there are inconsistencies between England and Wales and Sydney Water cost allocation policies.

## Capital expenditure

Tables 15 and 16 highlight the level of capital expenditure, per property, separated between ongoing capital maintenance and expenditure directed towards improving standards of service (including those that quality regulators impose). We compare data for 1997-2000 to the England and Wales average for 1995-2000. To a large extent the differences are likely to reflect legislative differences and other pressures on service providers to improve rather than efficiency.

### Water service

**Table 15 Annual capital expenditure per property by sub service area**

Water	England and Wales 1995-00		Sydney Water		
	average	range	1997-98	1998-99	1999-00
<b>Water resources &amp; treatment</b>	<b>15.8</b>	<b>1.6-45.5</b>	<b>2.5</b>	<b>5.0</b>	<b>0.4</b>
Maintenance	7.3	1.5-21.9	1.5	0.0	0.0
Enhancement	8.4	0.1-23.5	1.0	5.0	0.4
<b>Water distribution</b>	<b>37.3</b>	<b>9.2-71.9</b>	<b>8.5</b>	<b>11.0</b>	<b>23.9</b>
Maintenance	15	3.7-23.7	8.0	7.5	9.5
Enhancement	22.3	5.5-48.2	0.5	3.5	14.4
<b>Management and general</b>	<b>7.7</b>	<b>2.5-15.7</b>	<b>4.5</b>	<b>5.0</b>	<b>7.8</b>
<b>Water total</b>	<b>60.7</b>	<b>30.2-99.6</b>	<b>15.6</b>	<b>20.9</b>	<b>32.0</b>

Data for the England and Wales range column is not additive

The water service asset maintenance expenditure is higher for England and Wales companies than for Sydney Water, partly due to the externalisation of operation and maintenance of treatment works for water resources and treatment (meaning that capital maintenance is not required on these assets). Sydney Water's total capital expenditure for water resources and treatment is much lower than for previous years.

Distribution system, and water resources and treatment, expenditure is lower for Sydney Water compared to England and Wales companies, partly because Sydney Water has very few remaining unlined iron mains as a result of a rehabilitation programme in the 1960s. It is clear, however, that Sydney Water's water distribution enhancement expenditure has seen significant year-on-year increases. Last year's increase was particularly significant.

### Sewerage service

Sydney Water expected quality expenditure to increase significantly this year in order to meet anticipated environmental standards. Its 1999-2000 expenditure is significantly higher than 1998-1999, although its total capital expenditure is still lower than England and Wales. Expenditure on sewerage network enhancement, sewage treatment and sludge treatment, and disposal maintenance increased significantly. This brings Sydney Water's capital expenditure closer to England and Wales averages for both the sewerage network and management and general categories.

**Table 16 Annual capital expenditure per property by sub-service area**

Sewerage	England and Wales 1995-00		Sydney Water		
	average	range	1997-98	1998-99	1999-00
<b>Sewerage network</b>	<b>34.5</b>	<b>15.1-67.7</b>	<b>33.2</b>	<b>26.8</b>	<b>41.0</b>
Maintenance	10.7	7.1-17.0	18.1	19.7	19.5
Enhancement	23.7	8.0-50.7	15.2	7.1	21.4
<b>Sewage treatment &amp; sludge treatment and disposal</b>	<b>58.7</b>	<b>23.0-97.0</b>	<b>12.3</b>	<b>3.5</b>	<b>19.6</b>
Maintenance	13.0	6.8-21.3	6.2	0.9	19.0
Enhancement	45.7	16.2-75.7	6.1	2.6	0.7
<b>Management and general</b>	<b>8.9</b>	<b>4.7-11.8</b>	<b>2.3</b>	<b>2.1</b>	<b>9.9</b>
<b>Sewerage total</b>	<b>102.0</b>	<b>48.0-142.2</b>	<b>47.8</b>	<b>32.4</b>	<b>70.5</b>

Data for the England and Wales range column is not additive

The higher enhancement expenditure for sewage treatment and sludge treatment and disposal in England and Wales (required to meet new quality obligations) explains the difference in total cost.

## Network activity

Network activity measures provide a snapshot view of the performance of assets. We view these against longer term trends. Table 17 compares network activity rates, alongside burst and collapse rates for water mains and sewers, for Sydney Water since 1996, against the long term (1990-2000) average for England and Wales.

Sydney Water's network does not contain significant lengths of unlined mains and it does not, therefore, relined mains. Infrastructure activity levels are higher in England and Wales, where a comprehensive mains rehabilitation programme continues. The lower activity levels might partly explain Sydney Water's higher burst rate, although its overall trend since 1997-1998 is downwards. Sydney Water suffers from twice as many sewer collapses as England and Wales even though its sewer renovation rate is higher. Sydney Water has recently instigated a strategy aimed at improving sewer performance.

**Table 17 Network Activity**

	England and Wales 1990-00		Sydney Water			
	average	range	1996-97	1997-98	1998-99	1999-00
<b>% of total mains length</b>						
Renewed	0.91	0.1-1.5	0.16	0.19	0.16	0.06
Relined	0.58	<0.1-1.6	0.0	0.0	0.0	0.0
Mains bursts per 1000km	210	123-346	512	487	435	423
<b>% of total critical sewer length</b>						
Renovated	0.18	0.04-0.53	0.23	0.23	0.48	0.22
Replaced	0.13	0.03-0.46	0	0	0	0
Sewer collapses per 1000km	18	5-37	34	64	49	47

## Financial performance

Table 18 summarises some key financial indicators. Australian accounts are prepared on a current cost basis. Sydney Water's estimate of the gross Modern Equivalent Asset (MEA) value for replacing its assets is very low compared to the England and Wales companies, given the length of mains and sewers. This appears to be a common situation across the Australian industry. Different assumptions on the unit cost of replacement may be a factor. The lower MEA might partly explain the apparently higher rate of return on capital. England and Wales companies of roughly similar size, in terms of properties, mains and population served, quote a net replacement cost that is two to three times higher than Sydney Water.

**Table 18 Financial indicators**

	England and Wales				Sydney Water	
	average		range		1998-99	1999-00
	1998-99	1999-00	1998-99	1999-00		
Water and sewerage net replacement cost (MEA) (£/prop)	9,262*	8,908*	7,734-11,930*	6,920-11,745*	3,191	3,553
Current cost dividend cover	0.7	1.6	0.1-2.8	0.9-3.0	0.2	0.6
Dividend + interest / capital employed (%)	11	7	5-52	2.9-11.3	2	2
Current cost interest cover	3.8	3.5	2.1-10.6	2.1-12.7	1.7	2.1
Return on capital (MEA) (%)	1.3	1.3	0.8-2.6	0.9-2.7	2.3	2.1
Operating margin (%)	36	36	19-49	21-49	26	24

\*Water and sewerage companies only

## Confidence grades

The confidence grade system used in JR submissions established a basis for companies to express their view on data reliability and accuracy. The confidence grade is a combination of reliability and accuracy bands. Greater details of this system are in appendix 5.

Sydney Water's confidence grades are generally within those that England and Wales companies achieve. Sydney Water's confidence grades are broadly similar to last year with a limited improvement in some areas. Water related data has generally higher grades assigned than sewerage.

Sydney Water did not employ a Reporter to audit and challenge the data. While past Sydney Water submissions were audited, providing a degree of comfort, some caution must still be applied.

## **A2 Water Corporation Western Australia**

### **Data sources**

The Water Corporation of Western Australia submitted data directly to us in the form of an audited, slimmed down June Return. This contains additional data to that available for the other Australian comparators in this report. A small amount of additional data is from WSAAfacts 2000.

### **Regulatory bodies**

In 1996 the Western Australia government created the Water Corporation Western Australia to manage water and sewerage services. The government remained the owner. The Water and Rivers Commission considers water resources, the Department of Public Health considers water quality and the Department of Environmental Protection consider environmental concerns. The Office of Water Regulation and the government consider economic and customer service regulation.

### **Customer service levels**

#### **Overall Performance Assessment (OPA)**

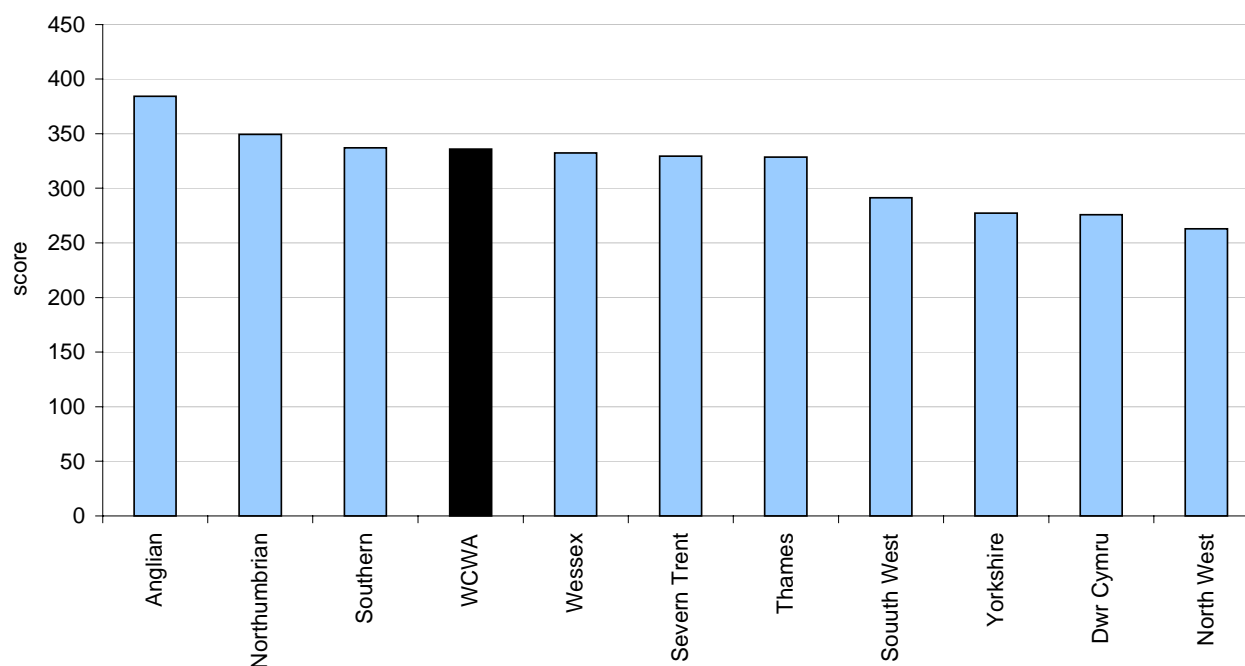
As part of this year's submission, Water Corporation agreed to participate in the OPA that we produce as part of the comparison of levels of service. Water Corporation achieves a score of 336 points, towards the upper range for water and sewerage companies (Figure 3). We developed the OPA to provide us with a broad overall assessment of company service provision beyond DG service indicators. The score encompasses a range of services beyond the main indicators of water and sewerage performance, such as services to customers with special needs and environmental performance (see appendix 3 for further details).

The design of the OPA takes account of the UK operating environment and may not be entirely appropriate to the Australian operating environment.

#### **Performance against DG levels of service indicators**

The majority of England and Wales companies meet the satisfactory standard for each of the measures. Water Corporation performance is close to the top of the performance range for DG2, DG3, DG5 and DG8, achieving a 'good' assessment under our methodology for each of these measures. In contrast, Water Corporation's performance for DG6, DG7 and DG9 is below the minimum performance level required to meet our 'satisfactory' assessment. Water Corporation aligns its processes and systems with the appropriate targets in its operating licence. In these three categories the targets set out in the licence are lower than England and Wales targets. Table 19 provides a summary of Water Corporation performance compared to the England and Wales companies for 1998-99 and 1999-00. For further details on DG indicators see appendix 2.

**Figure 3: 1999-00 Overall Performance Assessment Score for Wascs**



**Table 19 Performance against DG levels of service indicators**

	England and Wales				Water Corporation		
	average		range				
	1998-99	1999-00	1998-99	1999-00			
<b>DG2</b>	Properties at risk of low pressure (%)	0.17	0.13	0-3.47	0-1.46	0	
<b>DG3</b>	Properties subject to unplanned supply interruptions (%)	>12 hours	0.05	0.06	0-0.24	0-1.51	0.01
		>6 hours	0.33	0.36	0-0.99	0-1.80	0.01
<b>DG5</b>	Properties subject to flooding incidents (per 100,000 properties)	overloaded sewers	9.4	16.9	1.3-16.8	7.7-33.5	0.0
		'other causes'	14.0	14.9	7.7-22.7	5.1-20.5	10.5
<b>DG6</b>	Billing contacts not responded to within five working days (%)	2.5	1.5	0-6.0	0-4.1	5.7	
<b>DG7</b>	Written complaints not responded to within 10 working days (%)	1.3	0.6	0-4.7	0-6.6	38.9	
<b>DG8</b>	Bills not based on meter readings (metered properties) (%)	0.3	0.3	0-1.0	0-0.5	0	
<b>DG9</b>	Received telephone calls not answered within 30 seconds (%)	10	9	2-17	2-31	28	

## **DG2 Pressure of mains water**

Water Corporation is required, in its operating licence, to provide a 15 metre head of pressure at the water meter. Water Corporation did not record any cases of properties receiving pressure below the reference level, placing it within the 'above average' assessment.

Water Corporation methodology is sufficiently robust to justify the company reporting a zero return. Only one company in England and Wales matches this performance.

## **DG3 Supply interruptions**

Companies in England and Wales must report unplanned interruptions of 6, 12 or 24 hours. Urban residential housing in Australia is not designed to include storage tanks. Storage tanks provide a limited buffer against supply interruptions. The absence of these tanks provides a greater incentive to minimise interruptions.

Water Corporation is near the top of the performance range and is rated as 'good'. Only one of the England and Wales companies outperformed Water Corporation.

## **DG4 Properties subjected to water restrictions**

Water Corporation employs a permanent ban on sprinkler use between 9am and 6pm. This is not a restriction because water use is not limited outside of these hours. It is viewed as a water efficiency measure that addresses long term supply/demand concerns through the reduction of evapo-transpiration.

## **DG5 Properties subject to sewer flooding incidents**

Water Corporation did not report any cases of flooding due to overloaded sewers (the England and Wales industry mean was 16.9 per 100,000), placing it within the 'above average' assessment.

The Water Corporation figure of 10.5 per 100,000 of customers suffering sewer flooding as a result of 'other causes' is equal to an 'above average' assessment.

Three England and Wales companies achieved a better performance than the Water Corporation achieved. The industry mean for 'other causes' was 14.9. The role of separate sewerage and rain water systems and surcharge gullies in Water Corporation's performance, as outlined for Sydney Water, applies equally to Water Corporation.

## **DG6 Response to billing queries**

The Water Corporation adopted an internal target of 90% for its Customer Charter requirement of responding to queries within 10 calendar days. On the basis of England and Wales standards for DG6, Water Corporation's performance places it within the 'needs improvement' category. It achieves our primary criteria of responding to at least 90% of billing contacts within five working days, but fails the secondary criteria of no more than 3% of responses taking more than 10 working days.

Total billing contacts are far higher this year compared to the previous Water Corporation submission.

This may be due to a combination of greater data reliability, better information on telephone contacts for customers and a new telephone system perceived to be more customer friendly.

Water Corporation is unable to separate contacts from customers within the metropolitan area from the non-metropolitan area. The data may, therefore, be slightly overstated. Water Corporation's new call centre may also have contributed to the increase.

### **DG7 Response to written complaints**

Water Corporation's operating licence sets a target of resolving 90% of written complaints within 21 calendar days. DG7 assesses companies against two sets of criteria, responses within 10 working days and responses that take longer than 20 working days.

Water Corporation sits within the 'needs improvement' category achieving 61.1% and 5.6% respectively.

The England and Wales average is 99.4% and 0.1%. The number of complaints in total is much lower for Water Corporation than England and Wales (1.4 per 1,000 compared to 5.2). Although the Water Corporation's target specifies 'resolution' as opposed to 'response', our definition of what a response entails is very similar.

### **DG8 Meter reading**

Universal metering has been in place for a number of years across Australia, including Perth, and this experience of meter services has helped Water Corporation achieve a very high performance for meter reading (99.96%).

All the England and Wales companies are near to the top of performance but the industry mean, at 99.67%, is below Water Corporation performance. The lowest score was 99.5%.

### **DG9 Telephone contact**

The number of telephone contacts is significantly greater than the last submission. This relates to the factors set out for DG6. In spite of this, the percentage of calls answered in 30 seconds remains relatively constant (71% in 1997-1998 compared to 72% in 1999-2000).

Water Corporation's operating licence sets a target of 70% of calls responded to within 20 seconds. Water Corporation falls within the 'needs improvement' category.

The closest performance to Water Corporation is 68.6% followed by 87.1%. The 'acceptable' rating requires more than 86% of calls to be answered within 30 seconds.

## Volume of water delivered and leakage

Table 20 sets out the key water use parameters for Water Corporation and England and Wales.

All customers (household and non-household) in Water Corporation have a metered supply and all household customers are externally metered (internal metering of household properties is considered negligible).

While Water Corporation total leakage compares favourably to the England and Wales industry averages, it is difficult to compare directly.

Water Corporation installs meters externally and has legal responsibility, under its operating licence, as far as the meter on the property.

It only focuses on leakage on company pipes, which means that all the water that reaches the customer's external meter counts as water delivered.

Water Corporation bills the customer for this and does not, therefore, make an estimate of customer side leakage.

**Table 20 Water delivered, leakage and consumption**

	England and Wales average		Water Corporation
	1998-99	1999-00	1999-00
Distribution input (l/prop/day)	654	646	1319
Distribution losses (l/prop/day)	113	105	66
Total leakage (l/prop/day)	154	143	108
Proportion of water delivered to non-households (%)	32	32	23
Measured household consumption(l/head/day)	136	137	338.5
Unmeasured households consumption(l/head /day)	148	151	-
Average household consumption(l/head/day)	146	149	338.5

Figure 4 compares Water Corporation distribution losses against the best and worst performing water and sewerage companies, water only companies and industry averages. Water Corporation performs very well on this basis.

Per capita consumption (pcc) for Water Corporation differs significantly from levels in England and Wales. The Water Corporation figure of 338.5 l/head/day more than doubles the average found in England and Wales for measured customers (Figure 5).

Differences in climate, affluence and attitudes to, and standards of, water efficiency may play a part. Water Corporation report that, in fact, based on recent research, 54% of this pcc is thought to relate to use in the garden, much higher than in England and Wales (see Table 6).

As most water consumption is metered, top down estimates of leakage are likely to be more reliable than England and Wales.

Yet some uncertainties remain. Water Corporation uses estimates of water taken unbilled and water used operationally because this information is not collected/kept. Operational use appears high compared to that of comparably sized water companies (although it is close to the estimate of a similarly sized water and sewerage company, Wessex Water).

**Figure 4: Distribution losses - Water Corporation vs England and Wales**

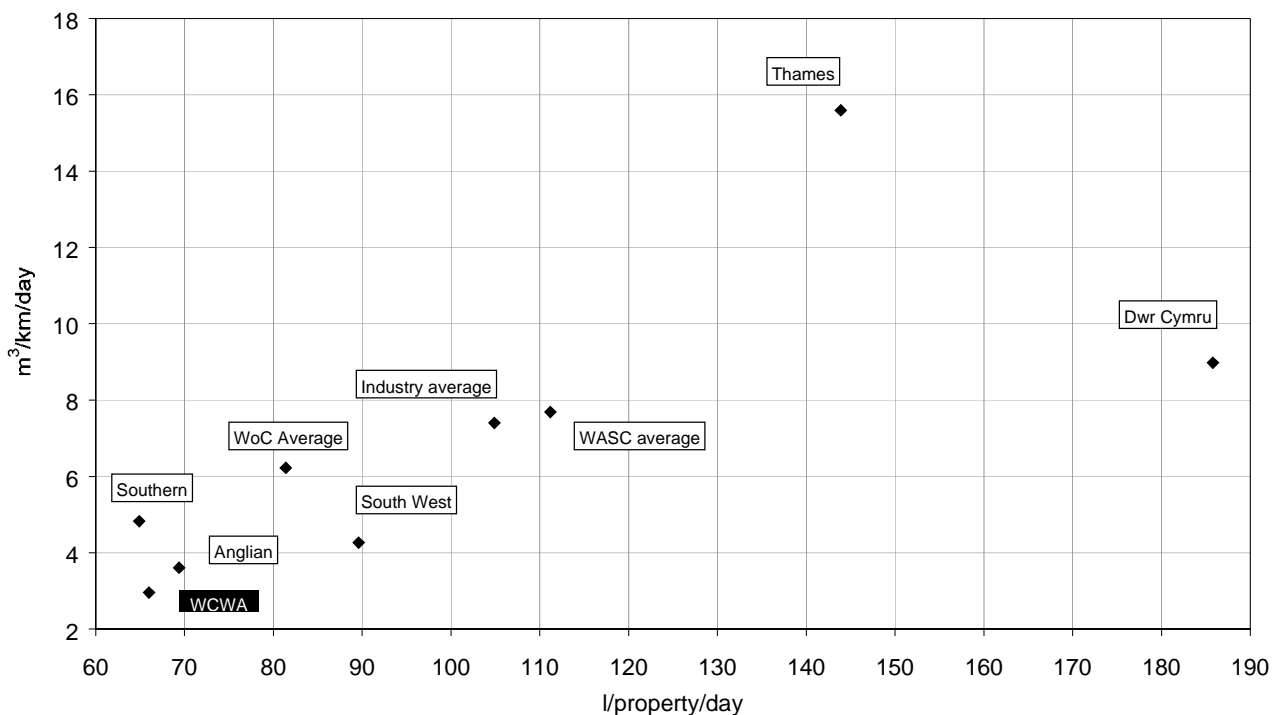
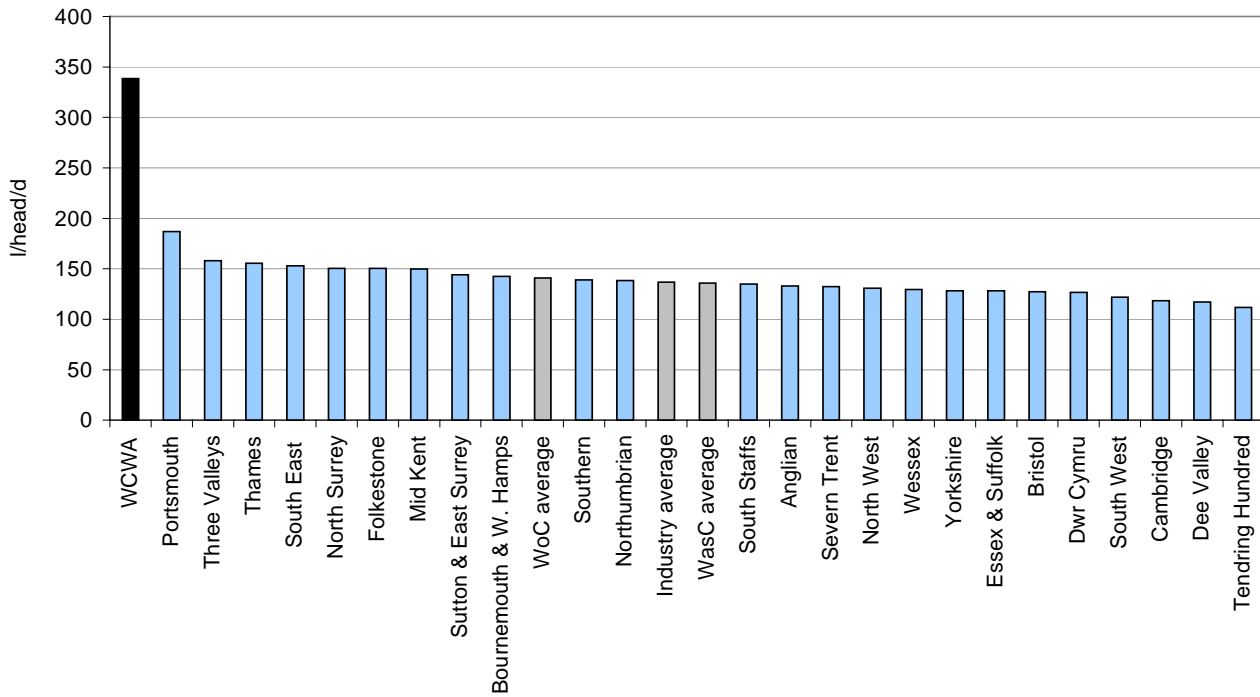


Figure 5: Measured pcc



## Operating Expenditure

### Water unit cost comparisons

Tables 21 and 22 compare unit costs of Water Corporation to England and Wales for the water service.

Table 21 Costs per unit of water delivered (p/m<sup>3</sup>)

Water	England and Wales 1999-00		Water Corporation
	average	range	1999-00
<b>Cost of operations</b>	<b>31</b>	<b>24-52</b>	<b>14</b>
Resources and treatment	10	6-19	7
Distribution	11	8-22	4
Business activity	11	7-15	3
<b>Cost of capital maintenance</b>	<b>18</b>	<b>9-26</b>	<b>10</b>
<b>Return on capital</b>	<b>23</b>	<b>11-54</b>	<b>16</b>
<b>Total cost</b>	<b>72</b>	<b>48-128</b>	<b>40</b>

Data for the England and Wales range column is not additive.

**Table 22 Costs per property of water delivered (£/ property)**

	England and Wales 1999-00		Water Corporation
	average	range	1999-00
<b>Cost of operations</b>	<b>66</b>	<b>50-88</b>	<b>65</b>
Resources and treatment	20	13-40	34
Distribution	23	17-33	17
Business activity	22	15-29	14
<b>Cost of capital maintenance</b>	<b>38</b>	<b>18-52</b>	<b>44</b>
<b>Return on capital</b>	<b>46</b>	<b>21-76</b>	<b>74</b>
<b>Total cost</b>	<b>150</b>	<b>100-181</b>	<b>183</b>

Data for the England and Wales range column is not additive.

Cost of operations and cost of capital maintenance are well below the England and Wales company average, on a per unit water delivered basis. This contrasts to the situation on a per property basis, where its cost of operations is in line with the England and Wales average and its capital maintenance costs are slightly higher.

The situation is similar when its return on capital unit costs are compared. This contrast may reflect the large differences in per capita consumption between Water Corporation and England and Wales. Resources and treatment (in £ per property) appears to be particularly high.

### **Sewerage unit cost comparisons**

Tables 23 and 24 set out sewerage unit costs. Water Corporation costs are significantly higher than the England and Wales average for capital maintenance and return on capital on both a sewage collected and per property basis. Cost of operations is approximately in line across the two measures.

Water Corporation cost of operating underground networks is lower for water but significantly higher for sewerage. Energy costs and the number of pumping stations are a significant factor in Water Corporation sewerage costs.

This is because the land is flat and the population that Water Corporation serves is low density and widely spread.

Also, odour control has become a major issue with land values increasingly causing buffer zones around works to be sold off by local councils. Significant investment is being implemented to combat this issue.

Total reported waste water service operating expenditure increased by 4% since the last submission.

**Table 23 Costs per unit of sewage collected (p/m<sup>3</sup>)**

Sewerage	England and Wales 1999-00		Water Corporation
	average	range	1999-00
<b>Cost of operations</b>	<b>28</b>	<b>21-42</b>	<b>31</b>
Sewerage	5	3-10	14
Sewage treatment	9	6-17	11
Sludge disposal	5	3-9	0
Business activity	9	7-13	6
<b>Cost of capital maintenance</b>	<b>24</b>	<b>17-33</b>	<b>39</b>
<b>Return on capital</b>	<b>45</b>	<b>26-103</b>	<b>91</b>
<b>Total cost</b>	<b>97</b>	<b>63-178</b>	<b>160</b>

Data for the England and Wales range column is not additive.

**Table 24 Costs per property for sewage collected (£/ prop)**

Sewerage	England and Wales 1999-00		Water Corporation
	average	range	1999-00
<b>Cost of operations</b>	<b>50</b>	<b>42-65</b>	<b>47</b>
Sewerage	9	6-17	21
Sewage treatment	16	12-26	17
Sludge disposal	10	6-14	0
Business activity	15	12-22	10
<b>Cost of capital maintenance</b>	<b>42</b>	<b>34-58</b>	<b>58</b>
<b>Return on capital</b>	<b>80</b>	<b>50-159</b>	<b>137</b>
<b>Total cost</b>	<b>172</b>	<b>128-275</b>	<b>242</b>

Data for the England and Wales range column is not additive.

## Econometric Models

Within the constraints of this study, sufficient data was only available to run econometric models for water service operating expenditure and capital maintenance. Sewerage service modelling requires additional information outside of the June Return submission.

Water Corporation is placed in Band D for the combined water model. Water Corporation, in a similar manner to Sydney Water, fair well on the power sub-service model.

However, Water Corporation, with a relatively low winter population and the absence of distribution input from river sources, fair particularly badly on the Resources and Treatment (R&T) opex model. Excluding R&T from the combined model analysis would place Water Corporation in Band B, 'above average' efficiency.

As discussed for Sydney Water, the results of the combined econometric modelling for England and Wales companies are adjusted for certain atypical costs, special factors and non-econometric adjustments. Water Corporation results have not been adjusted for any such factors.

For all of the capital maintenance models, Water Corporation came in below the expected actual expenditure although it should be noted that there was no expenditure in the management and general category. Not surprisingly Water Corporation was well below the predicted overall expenditure. See appendix 4 for further details.

## Capital Expenditure

Tables 25 and 26 set out the level of capital expenditure per property, separated between ongoing capital maintenance and expenditure directed at meeting improved standards of service (including those that the quality regulators impose). For Water Corporation, total capital enhancement expenditure is the cost driver.

### Water service

Capital maintenance for both water resources, and treatment and water distribution, is much lower than England and Wales. Capital enhancement expenditure, on the other hand, is much higher than England and Wales in both categories.

Water Corporation overall expenditure is far higher than in England and Wales companies in both categories. To a large extent, the differences are likely to reflect legislative and other pressures on service providers to improve rather than efficiency.

Due to a severe shortage of rainfall over the last 20 years, Water Corporation has had to bring forward source development. Infrastructure is designed to cope with the peak demand period that lasts for two months of the year.

Water Corporation is currently undertaking additional expenditure above that envisaged, and funded under the current price regime, to meet customer demands on water quality.

**Table 25 Annual capital expenditure per property by sub service area**

Water	England and Wales 1995-00		Water Corporation
	average	range	1999-0
<b>Water resources &amp; treatment</b>	<b>15.8</b>	<b>1.6-45.5</b>	<b>75.6</b>
Maintenance	7.3	1.5-21.9	3.7
Enhancement	8.4	0.1-23.5	71.9
<b>Water distribution</b>	<b>37.3</b>	<b>9.2-71.9</b>	<b>76.1</b>
Maintenance	15	3.7-23.7	0.3
Enhancement	22.3	5.5-48.2	75.8
<b>Management and general</b>	<b>7.7</b>	<b>2.5-15.7</b>	<b>0.0</b>
<b>Water total</b>	<b>60.7</b>	<b>30.2-99.6</b>	<b>151.7</b>

Data for the England and Wales range column is not additive

## Sewerage service

Maintenance on the sewerage network is closer to the England and Wales average but is very low for sewage treatment and sludge treatment and disposal.

**Table 26 Annual capital expenditure per property by sub-service area**

Sewerage	England and Wales 1995-00		Water Corporation
	average	range	1999-00
<b>Sewerage network</b>	<b>34.5</b>	<b>15.1-67.7</b>	<b>85.2</b>
Maintenance	10.7	7.1-17.0	7.0
Enhancement	23.7	8.0-50.7	78.2
<b>Sewage treatment &amp; sludge treatment and disposal</b>	<b>58.7</b>	<b>23.0-97.0</b>	<b>14.6</b>
Maintenance	13.0	6.8-21.3	1.1
Enhancement	45.7	16.2-75.7	13.5
<b>Management and general</b>	<b>8.9</b>	<b>4.7-11.8</b>	<b>0.0</b>
<b>Sewerage total</b>	<b>102.0</b>	<b>48.0-142.2</b>	<b>99.7</b>

Data for the England and Wales range column is not additive

Enhancement costs for the sewerage network are much higher than England and Wales but, interestingly, sewage treatment and sludge treatment and disposal expenditure is lower than England and Wales.

The increase in capital expenditure in sewerage is mainly derived from the upgrading of three major treatment plants to cope with normal growth plus the growth from the infill sewerage programme.

This 10-year programme seeks to connect large numbers of properties to the sewerage system.

Odour control is also now a large part of capital expenditure in sewerage. Odour control is an issue that may become increasingly important in England and Wales.

## Financial Performance

Table 27 summarises key financial indicators. Water Corporation's estimate of the gross Modern Equivalent Asset value for replacing its assets is very low compared to the England and Wales companies, given the length of mains and sewers.

As mentioned for Sydney Water, this appears common within the Australian industry. Differing unit cost of replacement assumptions may be a factor.

It might partly explain the apparently higher rate of return on capital. England and Wales companies of roughly similar size, in terms of properties, mains and population served, quote a net replacement cost that is up to two times higher than Water Corporation. Water Corporation interest cover is in line with the highest in the industry.

**Table 27 Financial indicators**

	England and Wales 1999-00		Water Corporation
	average	range	1999-00
Net replacement cost (MEA) (£/prop)	8,908*	6,920-11,745*	5,115
Current cost dividend cover	1.6	0.9-3.0	1.0
Dividend + interest /capital employed (%)	7	2.9-11.3	3
Current cost interest cover	3.5	2.1-12.7	13.0
Return on capital (MEA) (%)	1.3	0.9-2.7	4.7
Operating margin (%)	36	21-49	55

\*Water and sewerage companies only

## Network Activity

Network activity measures provide a good indication of the performance of assets. Annual data provide a snapshot view of performance, which we view against longer term trends. Table 28 compares network activity, water mains burst rates and sewer collapse rates for Water Corporation in 1999-00 against the long term (1990-99) average for England and Wales. Infrastructure activity levels generally are higher in England and Wales, while mains burst rates for Water Corporation water mains are low compared to England and Wales.

The low levels of mains renewal may be a result of a high longevity of assets, a relatively young asset age or the low burst rate. In addition, a comprehensive mains rehabilitation programme is underway in England and Wales which may partly explain the differential in activity. Sewer collapses are well below England and Wales industry averages although rates of renovation mirror England and Wales averages.

**Table 28 Network Activity**

	England and Wales 1990-00		Water Corporation
	average	range	1999-00
<b>% of total mains length</b>			
Renewed	0.91	0.1-1.5	0.02
Relined	0.58	<0.1-1.6	0.0
Mains bursts per 1000km	210	123-346	126
<b>% of total critical sewer length</b>			
Renovated	0.18	0.04-0.53	0.14
Replaced	0.13	0.03-0.46	0.0
Sewer collapses per 1000km	18	5-37	<b>2</b>

## Confidence Grades

Water Corporation confidence grades are generally within those that the England and Wales companies as a whole achieve. Water Corporation grades only stray outside of the England and Wales range on a few occasions. Reporters have audited Water Corporation's data submission for 1999-00. Generally, the water-related data has higher grades assigned than sewerage. Further details of this system are in appendix 5.

## A3 Other Australian companies

### Data sources

There were two main sources of data for the Australian water and sewerage providers reviewed in the section.

The Water Services Association of Australia publishes WSAAfacts annually. This covers most aspects of company performance that we review. WSAA members submit data for their metropolitan operations only.

This study considers information available for those enterprises serving the largest cities. As in WSAAfacts, data for the metropolitan areas is separate from data for the empty hinterland areas.

However, the section on financial indicators covers the entire business, which for some companies includes these areas.

Table 29 sets out the abbreviations used in this report for the Australian companies.

**Table 29 Company abbreviations**

<b>Abbreviations used in tables in this report</b>	<b>Company name</b>	<b>Urban area served</b>
BRB	Brisbane Water	Brisbane, Queensland
CW	CityWest Water	Melbourne, Victoria
GC	Gold Coast Water	Gold Coast, Queensland
SAW	South Australia Water Corporation	Adelaide, South Australia
SEW	South East Water Limited	Melbourne, Victoria
YVW	Yarra Valley Water	Melbourne, Victoria

We checked each corporation's annual report for data consistency and for financial information not included in WSAAfacts.

### Characteristics of the companies

Tables 30 and 31 set out a number of indicators, comparing them to equivalent data for a selection of England and Wales companies.

The six Australian companies reviewed in this section range in size from the equivalent of a fairly large water and sewerage company (WaSC) to companies that are smaller than any WaSCs.

Australian companies share a number of characteristics with England and Wales.

Population per connection and length of main per property are similar, perhaps because WSAAfacts covers only urban areas. Other aspects are strikingly different. This is particularly apparent in terms of the local climate and level of metering.

**Table 30 Comparison of base data with a range of England and Wales companies**

	Properties connected (000s)		Population served (000s)		Volume (Mld)		Network length (000 km)		Turn-over £m
	Water	Sewerage	Water	Sewerage	Water delivered	Sewage collected	Water	Sewerage	Total
BRB	350	339	850	823	341	321	5.7	6.4	125
CW	257	254	571	571	308	289	3.5	3.1	72
GC	185	173	406	380	137	133	2.7	2.6	53
SAW	454	431	1,050	1,029	368	259	8.6	6.7	119
SEW	532	494	1,286	1,286	433	312	7.8	7.0	100
YVW	584	531	1,553	1,553	466	360	8.5	7.9	119
Southern	989	1,748	2,222	4,444	518	809	13.3	20.8	465
South West	708	633	1,523	1,546	364	258	14.9	8.6	275
Wessex	516	1,045	1,180	2,497	304	484	11.1	15.4	277
Thames	3,425	5,301	7,801	12,660	2,049	2,818	31.6	66.9	1103

**Table 31 Comparison of operating environment with England and Wales average**

	Population per connection (Water)	Household meter penetration (%)	Climate indicators			Length of main per property (m)	
			Annual rainfall (mm)	Average temp. (°C)		Water	Sewerage
				Min.	Max.		
BRB	2.4	100%	954	15.5	24.3	16.3	18.9
CW	2.2	100%	611	12.1	21.1	13.8	12.1
GC	2.2	100%	1,295	17.3	24.1	14.6	15.2
SAW	2.3	100%	677	12.7	22.3	18.9	15.6
SEW	2.4	100%	611	12.1	21.1	14.6	14.2
YVW	2.7	100%	611	12.1	21.1	14.5	15.0
E&W average	2.3	17%	1,057	n/a	n/a	14.1	13.6
E&W lowest	2.1	1%	-	-	-	8.9	11.8
E&W highest	2.4	42%	-	-	-	21.5	15.4

## Customer service levels

While information relating to customer service levels is limited, it generally seems that performance in Australia is similar to that of England and Wales (Table 32).

This is particularly evident in responses to account contacts and written complaints. Both sewer flooding and mains burst appear higher in Australia. As discussed for Sydney Water and Water Corporation, many of the flooding incidents may be external only.

Data on bursts seem to suggest that the underground networks are in worse condition than those in England and Wales. Given the large variation in Australian data it might be that differences in part are related to differing definitions although soil types and age of networks might also contribute.

**Table 32 Customer service indicators**

	England and Wales		BRB	CW	GC	SAW	SEW	YVW
	average	range						
Properties subject to unplanned interruptions >six hrs (%)	0.36	0-1.8	0.76	0.59	-	-	0.31	0.17
Properties subject to sewer flooding incidents (per 100,000 properties)	32	16-49	20	98	13	354	63	120
Billing contacts not responded to in 10 days (%)	0.5	0-2	0.4	0	-	0	0	0
Written complaints not responded to within 10 working days (%)	0.6	0-6.6	0	0	-	0	0	2
Mains bursts per 1000km	210	123-346	376	701	136	246	264	421

## Environmental performance and sewage volumes

For most areas of Australia secondary treatment is most common (Table 33). Increases in the proportion of sewage receiving higher standards of treatment will be stepped, reflecting new treatment processes or treatment works coming on line.

In general, the higher the level of treatment the greater the associated operating expenditure. WSAAfacts suggest a relative increase in costs of 1:3:6 from primary through to tertiary (1 represents the relative cost of primary treatment).

However, the introduction of more sophisticated treatment also brings an opportunity to rationalise works and reduce operating costs. The volume of waste water returned, per property, to the network is significantly higher than even the highest figure in England and Wales.

WSAAfacts estimates that the waste water returned data includes 92l/prop/d of infiltration, approximately 11% of the volume returned.

**Table 33 Environmental performance and sewage volumes**

	England and Wales		BRB	CW	GC	SAW	SEW	YVW
	average	range						
<b>Proportion of treatment</b>								
Primary only (%)	14	0-54	0	0	0	0	0	0
Secondary (%)	61	31-76	63	100	89	100	87	0
Tertiary (%)	25	3-42	37	0	11	0	13	100
Volume of waste water returned (l/prop/d)	469	409-535	945	1139	768	600	632	678

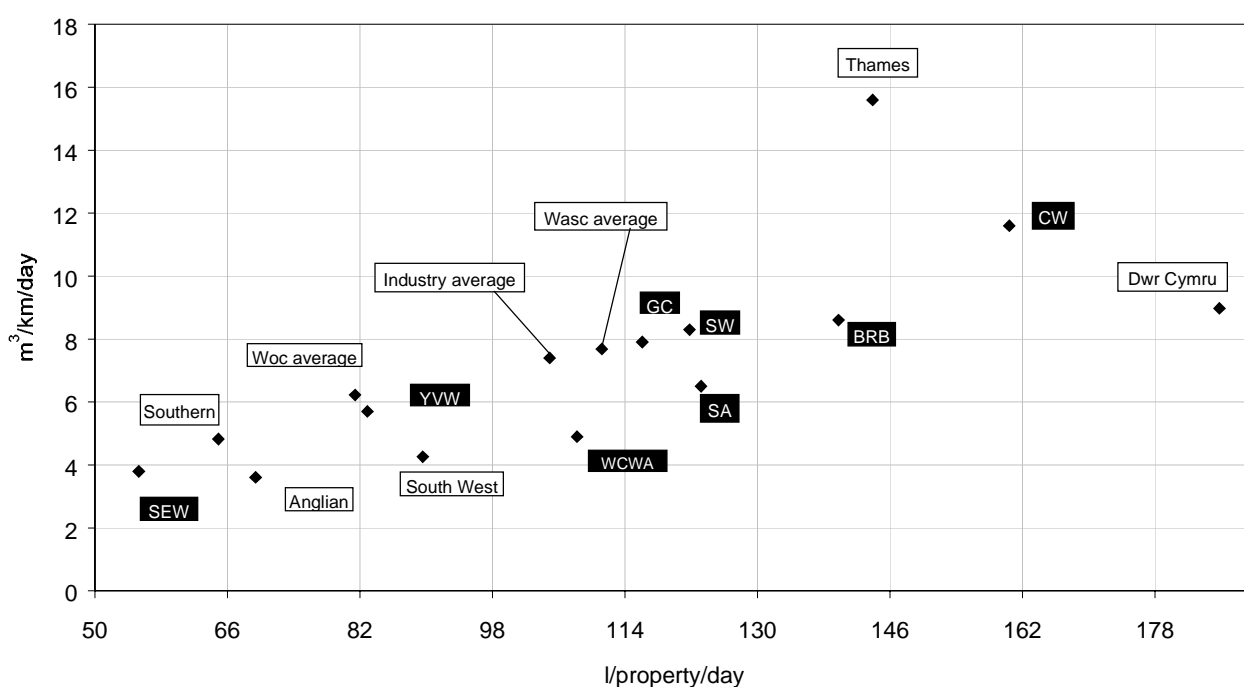
## Volume of water delivered and leakage

Table 34 sets out the key parameters for water use. It is evident, as with last year, that water demand is much higher in Australia compared to England and Wales. Consumption amongst all the Australian companies is almost double that of England and Wales. While Australian distribution inputs are higher, distribution losses are more in line with the levels experienced in England and Wales (Figure 6). Estimates of supply pipe leakage are not available.

**Table 34 Water delivered, leakage and consumption**

	England and Wales		BRB	CW	GC	SAW	SEW	YVW
	average	range						
Distribution input (l/prop/day)	646	433-852	1165	1359	888	1124	907	927
Distribution losses (l/prop/day)	105	55-186	140	160	116	123	55	83
Proportion of water delivered to non H/H (%)	32	20-46	37	51	33	14	29	23
Measured H/H consumption (l/head/d)	137	112-187	252	264	225	301	240	231
H/H water delivered/population (l/head/d)*	160	129-187	252	264	225	301	240	231

**Figure 6 Distribution losses of Australian companies vs England and Wales**



## Unit cost comparisons

### Water service

Table 35 sets out the main components for the water service of the unit cost of water delivered.

The results demonstrate that the high level of water used per capita generates very low unit costs. Both operating costs and capital maintenance are lower than the England and Wales average for all the Australian companies considered. It appears that even the lowest cost companies in England and Wales cannot supply water at such low volumetric rates as the highest cost Australian comparator.

Capital maintenance costs are particularly low, perhaps due to the greater use of outsourcing to supplier companies.

In Melbourne, for example, a separate company provides all treated water to the three 'retailers' (City West, South East and Yarra Valley). The effect of this is to inflate operating costs and reduce capital maintenance. The return on capital component in Australia is similar to England and Wales.

Of course, these comparisons do not take account of the operating environment, level of treatment required, or scale economies. To the extent that economies of scale exist, the costs in Australia are bound to be lower since the volume of water delivered will have little effect on customer service and, assuming there are no supply constraints, the distribution costs.

When expressed in per property terms, as in Table 36, the comparison is far closer with the England and Wales average lying within the range of the Australian companies.

Total costs for South East Water and Yarra Valley (both serving Melbourne) are below the levels of even the lowest cost companies in England and Wales, despite relatively high returns on capital.

**Table 35 Cost per unit of water delivered (p/m<sup>3</sup>)**

	England and Wales		BRB	CW	GC	SAW	SEW	YVW
	average	range						
Cost of operations	31	24-52	19	8	16	21	13	11
Cost of capital maintenance	18	9-26	13	4	10	10	5	6
Return on capital	23	11-54	19	23	22	22	16	18
<b>Total cost</b>	<b>72</b>	<b>48-128</b>	<b>51</b>	<b>35</b>	<b>38</b>	<b>43</b>	<b>34</b>	<b>35</b>

Data for the England and Wales range column is not additive

**Table 36 Cost per property of water delivered (£/property)**

	England and Wales		BRB	CW	GC	SAW	SEW	YVW
	average	range						
Cost of operations	66	50-88	69	37	43	64	38	32
Cost of capital maintenance	38	18-52	47	16	28	29	14	16
Return on capital	46	21-76	69	101	59	66	47	52
<b>Total cost</b>	<b>150</b>	<b>100-181</b>	<b>185</b>	<b>154</b>	<b>130</b>	<b>159</b>	<b>99</b>	<b>100</b>

Data for the England and Wales range column is not additive

### Sewerage service

Tables 37 and 38 make the same comparisons for the sewerage service. As with water, the higher volumes passing through the network in Australia lead to lower estimates of the costs of the service, in volumetric terms.

Volume is probably a less appropriate cost driver for the sewerage service because factors such as the level of treatment required, the size of the sewer network and the total pollution load will all affect cost.

The number of properties is likely to be a better denominator, at least serving as a proxy for the amount of pollution generated. This shows the England and Wales companies in a more favourable light. Operating costs appear more in line with the Australian companies.

Capital maintenance and return on capital costs still appear higher in England and Wales. South East Water and Yarra Valley's costs are, again, below that of even the lowest cost companies in this country.

**Table 37 Cost per unit of sewage collected (p/m<sup>3</sup>)**

	England and Wales		BRB	CW	GC	SAW	SEW	YVW
	average	range						
Cost of operations	28	21-42	16	13	21	21	16	18
Cost of capital maintenance	24	17-33	13	3	13	13	7	7
Return on capital	45	26-103	23	14	26	39	26	21
<b>Total cost</b>	<b>97</b>	<b>63-178</b>	<b>51</b>	<b>31</b>	<b>60</b>	<b>74</b>	<b>48</b>	<b>46</b>

Data for the England and Wales range column is not additive

**Table 38 Cost per property for sewage collected (£/property)**

	England and Wales		BRB	CW	GC	SAW	SEW	YVW
	average	range						
Cost of operations	50	42-65	54	55	59	46	36	45
Cost of capital maintenance	42	34-58	45	14	36	29	16	18
Return on capital	80	50-159	79	58	72	86	59	51
<b>Total cost</b>	<b>172</b>	<b>128-275</b>	<b>177</b>	<b>127</b>	<b>167</b>	<b>161</b>	<b>111</b>	<b>114</b>

Data for the England and Wales range column is not additive

## Financial performance

Tables 39 sets out some key financial ratios. Australian companies prepare their financial accounts on a current cost basis, as in England and Wales.

Australian estimates of replacement costs are much lower, in terms of amount per property served. Because of this, the return on capital for the Australian companies is above that for England and Wales.

The rate of profit compared to replacement cost and operating margins varies considerably.

Dividends (where paid) are roughly the same as in England and Wales compared to profit levels.

**Table 39 Financial indicators**

	England and Wales		BRB	CW	GC	SAW	SEW	YVW
	average	range						
Net replacement cost (MEA) (£/prop)	8908*	6920-11745*	2986	1415	2392	3431	1167	1233
Current cost dividend cover	1.6	0.9-3.0	2.2	1.9	-	0.1	1.0	0.9
Current cost interest cover	3.5	2.1-12.7	2.9	10.3	7.9	2.1	4.5	2.7
Return on capital (MEA) (%)	1.3	0.9-2.7	5	14	8	3	6	5
Operating margin (%)	36	21-49	38	71	68	32	36	29

\* Water and sewerage companies only

## **Key conclusions**

- Comparisons of unit costs purely on a volumetric basis appear to suggest that Australian companies are more efficient than those in England and Wales. High levels of consumption distort comparisons.
- Comparisons based on the number of properties paint a different picture. As in last year's report, South East and Yarra Valley report total cost levels significantly below England and Wales. The differences in costs for these two companies would require further investigation to decide whether this is a result of greater efficiency or relates to the operating environment.
- Financial indicators appear broadly similar to England and Wales, though with significant variations between both the Australian companies and between the England and Wales companies. Estimates of replacement costs are significantly lower in Australia.
- Limited comparison suggests aspects of customer service are similar across England and Wales and Australia.

## B The Netherlands

### Constitutional and regulatory framework

Water resources management in the Netherlands involves national, provincial and local government. Local and regional government bodies own the 18 companies that represent the majority of water service providers. The trade association VEWIN represents their interests.

The regional governments agree prices with the water providers on a regular basis although there does not appear to be a formal framework for price setting.

The government introduced a compulsory benchmarking system recently to encourage comparisons.

European Union directives affected the Netherlands less than many other EU states.

### Data sources

We have used company annual reports and data from an Anderson Consulting benchmarking exercise for VEWIN as the basis of this report. Table 40 outlines the abbreviations used in this report.

**Table 40 Company abbreviations**

Abbreviation used in tables in this report	Company name	Urban area served
DZH	Duinwaterbedrijf Zuid-Holland	South Holland
AMS	Gemeentewaterleidingen	Amsterdam
NHO	PWN Waterleidingbedrijf	North Holland
WG	Waterbedrijf Gelderland	Gelderland (Arnhem)
WML	Waterleiding Maatschappij Limburg	Limburg (Maastricht)
WMN	Waterleidingbedrijf Midden-Nederland	Mid Netherlands (Utrecht)
WMO	Waterleiding Maatschappij Overijssel	East Holland (Zwolle)
WOB	Waterleidingmaatschappij Oost-Brabant	East Brabant (Eindhoven)

## Characteristics of the companies

Tables 41 and 42 set out some key characteristics. The eight companies reviewed are generally similar in size to the larger water only companies in England and Wales. Operating conditions in the Netherlands and England and Wales are broadly similar. The climate is similar to that of England and Wales but the flatter nature of the Netherlands has some cost implications. There are some differences in terms of connection density. Urban areas such as Amsterdam (AMS) and South Holland (DZH) have a very low connection:network length ratio. Others such as Gelderland (WG) are more sparsely populated. Overall, 68% of the public water supply in the Netherlands is drawn from groundwater.

**Table 41 Comparison of base data with a range of England and Wales companies**

	Properties connected (000s)	Population served (000s)	Volume water delivered (MI/d)	Network length (000 km)	Turnover (water) (£m)
DZH	550	1131	191	3.9	75.1
AMS	412	n/a	181	2.1	58.4
NHO	685	n/a	295	9.4	108.7
WG	508	n/a	223	12.9	62.1
WML	455	n/a	198	7.6	61.1
WMN	522	n/a	215	6.1	47.6
WMO	488	n/a	208	12.0	58.3
WOB	586	1366	285	10.4	78.3
South West	708	1523	364	14.9	107
Wessex	516	1180	304	11.1	90
Essex & Suffolk	747	1700	432	8.5	117
North Surrey	198	480	118	2.5	33

**Table 42 Comparison of operating environment with England and Wales**

	Population per connection	H/H meter penetration (%)	Ground or surface water	Length of main per property (m)	
				Water	Sewerage
DZH	2.1	100	Surface	7.0	
AMS	-	100	Surface	5.1	
NHO	-	100	Surface	13.7	
WG	-	100	Ground	25.5	
WML	-	100	Ground	16.6	
WMN	-	100	Ground	11.6	
WMO	-	100	Ground	24.5	
WOB	2.3	100	Ground	17.7	
E & W average	2.3	17	Mixture	14.1	
E & W lowest	2.1	1	-	8.9	
E & W highest	2.4	42	-	21.5	

## Customer service levels

Little information is available on the level of customer service Dutch companies provide. The Andersen study considered customer satisfaction as recorded in surveys. This is not comparable with the information available for England and Wales. While these surveys suggest that 90% of customers are satisfied, or very satisfied, with service levels, the Andersen report notes that translation of customer standards into service guarantees is very limited. Water quality appears to be consistent with EU guidance with compliance between 94% and 99.9%.

## Volume of water delivered and leakage

Broadly speaking, distribution input reported is comparable to England and Wales, although slightly lower, perhaps as a result of near universal metering (Table 43). The Dutch companies, compared to England and Wales, tend to report very low levels of leakage (in some cases zero). DZH, for example, reports leakage of 0.09m<sup>3</sup>/km/hour. The England and Wales average is 0.42m<sup>3</sup>/km/hr.

This year we participated in a fact finding visit to the Netherlands (reported in the Environment Agency Demand Management Bulletin). While leakage control in the Netherlands is passive, a number of factors are thought to contribute to low leakage:

- low operating pressures;
- a newer system relative to England and Wales;
- low burst rates;
- mains tend to be located in footpaths under paving blocks. Sandy soils and a high water table means that virtually all leaks are visible;
- water quality controlled to minimise corrosion; and
- rapid response to reported leaks.

Water abstraction is highly taxed in the Netherlands. The Dutch tax is revenue-raising, targeting groundwater abstraction; those that are less reliant on groundwater face lower charges. The European Environment Agency notes that similar taxes apply in France and Germany. Generally, such taxes should provide an incentive to reduce water abstraction. One of the ways in which this could be achieved is through leakage reduction. Whether this tax has been an important incentive to lower levels of leakage in the Netherlands is hard to say.

**Table 43 Water delivered, leakage and consumption**

	England and Wales		DZH	AMS	NHO	WG	WML	WMN	WMO	WOB
	average	range								
Distribution input (l/prop/d)	646	433-852	316	639	431	464	478	424	454	495

## Unit cost comparisons

Table 44 reviews volumetric unit costs for each of the main components of customers' bills. In line with the VEWIN report, we separated the taxation element relating to abstraction from the analysis. We updated the VEWIN benchmarking study with information from the companies' 1999 annual reports. We assume the unit costs for tax are the same as in the VEWIN study. Generally, the operating cost component of bills in the Netherlands is higher than England and Wales, on a water delivered basis. While capital maintenance and return on capital unit costs appear lower, the addition of the abstraction tax element places total costs broadly in line with the England and Wales average.

**Table 44 Costs per unit of water delivered (p/m<sup>3</sup>)**

	England and Wales		DZH	AMS	NHO	WG	WML	WMN	WMO	WOB
	average	range								
Cost of operations	31	24-52	53	60	68	47	40	33	39	35
Abstraction charge	-	-	4	2	3	10	10	11	10	10
Cost of capital maintenance	18	9-26	22	17	26	12	15	10	13	20
Return on capital	23	11-54	28	9	5	8	19	4	15	10
<b>Total cost</b>	<b>72</b>	<b>48-128</b>	<b>108</b>	<b>89</b>	<b>101</b>	<b>76</b>	<b>84</b>	<b>59</b>	<b>77</b>	<b>75</b>

Data for the England and Wales range column is not additive

The very low returns on the capital employed suggest that there may be some form of subsidy involved. The lowest cost companies in the Netherlands tend to be those that almost exclusively rely on groundwater. Groundwater tends to be lower cost in terms of treatment requirements. The three companies with the highest costs are those that rely on surface water. Per property unit cost comparison (Table 45) suggests the Dutch companies are slightly better performers. This will be partly due to the lower consumption levels compared to England and Wales. There may also be differences in the rate of occupancy, which could affect the results. Again costs for Middle Netherlands are the lowest amongst the Dutch companies.

**Table 45 Costs per property of water delivered (£/property)**

	England and Wales		DZH	AMS	NHO	WG	WML	WMN	WMO	WOB
	average	range								
Cost of operations	66	50-88	68	97	106	75	64	51	61	63
Abstraction charge	-	-	6	3	4	16	15	17	15	18
Cost of capital maintenance	38	18-52	27	28	40	20	24	16	21	35
Return on capital	46	21-76	36	15	8	12	31	7	23	17
<b>Total cost</b>	<b>150</b>	<b>100-181</b>	<b>137</b>	<b>142</b>	<b>159</b>	<b>122</b>	<b>134</b>	<b>91</b>	<b>119</b>	<b>134</b>

Data for the England and Wales range column is not additive

## Financial performance

Some key financial indicators are set out in Table 46. The Netherlands companies' accounts are prepared on a historic cost basis, reflected in depreciation and the capital value recorded. The Dutch companies are publicly owned and do not pay dividends. Dutch companies' interest cover, return on capital and operating margins are much lower than in England and Wales. Lower profit levels might suggest that there are implicit subsidies built into the Dutch charging system.

**Table 46 Financial indicators**

	England and Wales		DZH	AMS	NHO	WG	WML	WMN	WMO	WOB
	average	range								
Water service (£/prop)	-	-	501	373	684	344	638	263	331	292
Dividend + interest / capital employed (%)	7	3-11	6	5	4	3	4	4	4	4
Historic cost interest cover	4.1	2.7-16.0	1.6	1.3	1.1	1.7	1.5	1.0	1.6	1.9
Return on capital (estimated capital employed) (%)	9.3	7.0-17.2	10	6	4	5	6	4	7	8
Operating margin (%)	36	21-49	36	17	18	15	28	12	19	17

## Key conclusions

- Companies in the Netherlands provide us with some useful comparative data on water consumption and cost levels.
- Comparisons of unit costs suggest that the best performers in the Netherlands are equal to the most efficient companies in England and Wales.
- Reported leakage levels in the Netherlands are extremely low. There is evidence to suggest that differences in both the operating environment and methodology employed can explain some of the disparity between the Netherlands and England and Wales.

## C United States of America

Table 47 Company abbreviations

Abbreviations used in tables in this report	Company name	Urban area served
CAL	California Water Service Company	Various communities including East LA and South San Francisco
IND	Indianapolis Water Company	Indianapolis
NJ	New Jersey-American Water Company	Monmouth / Camden / Cape May / Hunterdon
PEN	Penn American	Various communities including Pittsburgh and Hershey
PH	Philadelphia Suburban Water Company	Philadelphia
SJ	San Jose Water Company	San Jose Metropolitan Area
SC	Southern California	Sacramento / Santa Barbara / LA
SLC	St Louis County Water Company	St Louis County / North of Jefferson County

### Constitutional and regulatory framework

The number of water systems in the US is large, varying widely in size and form of ownership.

The form of regulation varies with the ownership and location of the system. Federal policy drives drinking water quality.

The privately owned concerns are members of a trade association, the National Association of Water Companies (NAWC).

Each of these companies is relatively small, none being larger than a big (in terms of properties connected) water only company in England and Wales. Many serve cities or suburban areas (Table 47).

Tribunals generally regulate prices in the US by fixing the rate of return that a company can earn on its assets. There is less emphasis on medium term incentive-based regulation as used in England and Wales.

Either a customer, if they think bills are too high, or a company, if it feels returns are insufficient, can trigger price reviews.

### Data sources

NAWC publishes a set of annual operating and financial data from its members. The information in this section is largely based on the published information for 1999.

## Characteristics of the companies

Table 48 sets out some key information relating to the size of the US companies. Table 49 compares population density. The eight companies reviewed are the largest of the private water companies in the US. However, even these are comparable only to medium to large-sized water only companies in England and Wales.

There are large differences in the operating environments of the US companies. The population distribution is sparse. There is a higher occupation rate per property that suggests that each connection serves a number of dwellings. It is likely that metering is universal.

**Table 48 Comparison of base data with some England and Wales companies**

	Properties connected (000s)	Population served (000s)	Volume (MI/d) of water delivered	Network length (000 km)	Turnover £m
CAL	388	1,600	832	7.5	125
IND	286	839	450	5.2	58
NJ	340	1,000	481	7.4	151
PEN	541	2,000	536	12.4	180
PH	308	1,000	337	5.8	93
SJ	216	979	491	3.9	72
SC	244	1,061	621	4.4	99
SLC	306	995	528	6.5	65
Essex & Suffolk	747	1,700	432	8.5	117
North Surrey	198	480	118	2.5	33
South West	707	1,523	364	14.9	275
Wessex	516	1,180	304	11.1	277

**Table 49 Comparison of operating environment with England and Wales**

	Population per connection (Water)	Household meter penetration (%)	Length of main per property (m) (Water)
CAL	4.1	100	19.5
IND	2.9	100	18.0
NJ	2.9	100	21.9
PEN	3.7	100	23.0
PH	3.2	100	18.8
SJ	4.5	100	18.0
SC	4.3	100	18.1
SLC	3.3	100	21.3
E & W average	2.3	17	14.1
E & W lowest	2.1	1	8.9
E & W highest	2.4	42	21.5

## Customer service levels

There are no data on the levels of customer service.

## Volume of water delivered and leakage

Table 50 sets out the key parameters for water use. This assessment is important in terms of assessing efficiency and deciding whether a company is using its water resources effectively.

As with Australia, there is a large variation between the consumption patterns of most of the US companies and England and Wales. In most cases per capita consumption appears to be at least twice that of England and Wales. There is, however, a marked variation among the US companies with both Pennsylvanian companies (PEN and PH) closer to the England and Wales' level. This could be a result of inconsistency in definitions, for example, how a company treats internal and external water use. These differences would affect the unit cost analysis.

Despite these concerns, climate and social and economic trends are clearly important determinants of the higher water use in the US. Hotter and drier climates in the areas that a number of companies serve, combined with higher living standards, appear to lead to higher consumption levels. Swimming pools and air conditioning are likely to be much more widespread. Garden watering will contribute to high consumption in arid areas such as California particularly if, in the face of low rainfall, inhabitants wish to maintain 'temperate zone' gardens with lawns.

All of the US companies appear to have higher leakage levels per property than England and Wales. Southern California is an exception, its leakage levels being closer to those in England and Wales. If higher demand were to lead to higher pressure levels this would, in turn, drive higher leakage levels. Recent work, carried out on behalf of AWWA, linked consumption in the US to both climate and garden size. It also suggested that outdoor use accounted for 58% of household use. This is much higher than England and Wales. The AWWA study suggested household leakage was approximately 6l/prop/day.

**Table 50 Water delivered, leakage and consumption**

	England and Wales average	England and Wales range	CAL	IND	NJ	PEN	PH	SJ	SC	SLC
Distribution input (l/prop/d)	646	433-852	2918	1853	1600	1358	1333	2443	2712	2068
Total leakage (l/prop/d)	143	78-223	773	278	186	366	238	167	169	341
Proportion of water delivered to non H/H	32	20-46	38	44	44	45	40	42	10	39
H/H water delivered/population (l/head/d)	160	129-187	323	298	270	148	202	294	525	324

## Unit cost comparisons

Table 51 sets out volumetric unit costs for each of the main components of customers' bills, broken down to sub-service area. The results are largely as one would expect, with the high volumes leading to low unit costs compared to England and Wales. In particular, distribution costs are much lower, suggesting that economies of scale, due to higher demand, are evident in this sub-service. The same seems to apply to capital maintenance charges. The return on capital component varies substantially among the companies reviewed.

**Table 51 Costs per unit of water delivered (p/m<sup>3</sup>)**

	England and Wales average	England and Wales range	CAL	IND	NJ	PEN	PH	SJ	SC	SLC
<b>Cost of operations</b>	<b>31</b>	<b>24-52</b>	<b>28</b>	<b>17</b>	<b>34</b>	<b>35</b>	<b>28</b>	<b>25</b>	<b>26</b>	<b>19</b>
Resources and treatment	10	6-19	17	6	17	11	11	18	15	6
Distribution	11	8-22	3	2	6	7	4	3	2	5
Business activity	11	7-15	8	10	11	18	12	4	9	8
<b>Cost of capital maintenance</b>	<b>18</b>	<b>9-26</b>	<b>3</b>	<b>5</b>	<b>9</b>	<b>13</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>5</b>
<b>Return on capital</b>	<b>23</b>	<b>11-54</b>	<b>10</b>	<b>13</b>	<b>43</b>	<b>44</b>	<b>39</b>	<b>11</b>	<b>14</b>	<b>10</b>
<b>Total cost</b>	<b>72</b>	<b>48-128</b>	<b>41</b>	<b>35</b>	<b>86</b>	<b>92</b>	<b>76</b>	<b>39</b>	<b>43</b>	<b>34</b>

Data for the England and Wales range column is not additive

Because of the wide variations in consumption levels and the fact that volume may be a poor determinant of costs for some areas of operations, we undertook an alternative analysis, in terms of cost per property (Table 52). This suggests that US costs are somewhat higher than England and Wales.

**Table 52 Costs per property of water delivered (£/property)**

	England and Wales average	England and Wales range	CAL	IND	NJ	PEN	PH	SJ	SC	SLC
<b>Cost of operations</b>	<b>66</b>	<b>50-88</b>	<b>218</b>	<b>99</b>	<b>176</b>	<b>127</b>	<b>111</b>	<b>208</b>	<b>245</b>	<b>122</b>
Resources and treatment	20	13-40	136	33	90	39	44	148	137	40
Distribution	23	17-33	22	9	29	25	17	24	21	31
Business activity	22	15-29	60	57	57	64	49	36	87	50
<b>Cost of capital maintenance</b>	<b>38</b>	<b>18-52</b>	<b>24</b>	<b>32</b>	<b>46</b>	<b>47</b>	<b>36</b>	<b>29</b>	<b>29</b>	<b>30</b>
<b>Return on capital</b>	<b>46</b>	<b>21-76</b>	<b>82</b>	<b>73</b>	<b>222</b>	<b>159</b>	<b>156</b>	<b>94</b>	<b>130</b>	<b>62</b>
<b>Total cost</b>	<b>150</b>	<b>100-181</b>	<b>324</b>	<b>204</b>	<b>444</b>	<b>333</b>	<b>303</b>	<b>331</b>	<b>404</b>	<b>214</b>

Data for the England and Wales range column is not additive

## Financial performance

Table 53 considers financial information provided in the NAWC report. One point to note is that US companies' accounts are prepared on an historic cost basis. There is, therefore, no concept of the MEA replacement value as used in England and Wales. In general, indicators for the US companies lie within the range of the England and Wales companies.

The return on assets and operating margin is somewhat higher than in England and Wales for a number of companies, particularly for New Jersey (NJ), Pennsylvania and Philadelphia.

**Table 53 Financial indicators**

	England and Wales		CAL	IND	NJ	PEN	PH	SJ	SC	SLC
	average	range								
Water service (£/prop)	-	-	792	1,263	1,674	1,505	1,329	866	1,165	752
Dividend + interest / capital employed (%)	7	3-11	5	2	6	6	6	4	5	4
Historic cost interest cover	4.1	2.7-16.0	3.8	2.8	3.9	2.6	3.7	4.7	3.7	3.0
Return on capital (estimated capital employed) (%)	9.3	7.0-17.2	9.5	4.9	12.9	9.9	11.1	10.2	10.5	6.8
Operating margin (%)	36	21-49	23	31	49	45	49	27	30	24

## Key conclusions

- High consumption levels make comparisons of costs more difficult. High outdoor use appears to be a particular source of additional consumption.
- Because of the high consumption levels, volumetric unit costs appear very much lower for the US companies than England and Wales. In contrast, total costs per property are a good deal higher, in particular for resources and treatment
- Financial indicators are generally comparable to England and Wales. Most indicators lie within the range that England and Wales companies report.

## D Purchasing Power Parity

The effect of fluctuations in exchange rates can significantly impact on unit costs and perceived efficiency. This may mask changes in costs. One possible method for correcting this is the Purchasing Power Parity theory (PPP).

The PPP theory states that exchange rates between currencies are in equilibrium when the purchasing power is the same in each of the two countries. This means that the exchange rate between two countries should equal the ratio of the countries' price level of a fixed basket of goods and services. When a country's domestic price level is increasing through inflation, we must apply a depreciating factor to that country's exchange rate in order to return to PPP.

The OECD publishes annual and monthly PPP figures for all OECD countries (Table 54). The table draws exchange rates from IMF International Financial Statistics.

**Table 54 Official and PPP exchange rates**

Country	Currency	Official exchange rate (US\$/currency)	PPP exchange rate	Degree of undervaluation (%)
Calendar year 2000:				
<b>United Kingdom</b>	£ Sterling	1.5161	1.5291	0.9
<b>Netherlands</b>	Guilder	0.4182	0.4975	19.0
<b>Australia</b>	A\$	0.5823	0.7634	31.1
Calendar year 1999				
<b>United Kingdom</b>	£ Sterling	1.618	1.5267	6.0 overvaluation
July 99 – June 2000:				
<b>Australia</b>	A\$	0.6138	0.7663	24.8

Notes: 1. Figures are period averages.  
2. Mid-year rates for Australia were interpolated to allow for Australian financial year.

It is important to state that the PPPs are based on a sample basket of goods and services selected to be representative of the Gross Domestic Product (GDP) for each country.

If PPPs specific to water industry expenditure were available they might differ from these although probably not substantially. Other caveats to be aware of include:

- for the theory to hold, there should be competitive markets for goods and services in each of the countries;
- people in different countries consume different sets of goods and services making the comparison not strictly like-for-like; and
- non-traded goods are not subject to the PPP law.

For the four countries we are considering, the first two points are unlikely to lead to large discrepancies, since all operate in competitive market environments and consumption patterns in these developed countries are probably sufficiently similar.

The third point could lead to errors. Trade between countries in construction and maintenance projects tends to be low.

For example, energy and labour costs may need specific corrections. On the other hand, trading in mechanical and electrical equipment and components is likely to occur.

Bearing these limitations in mind, the PPP US\$ exchange rates in Table 54 can be converted to base in sterling (Table 55) and applied to the relevant expenditure figures.

**Table 55 PPP exchange rates against sterling**

Country	Currency	PPP exchange rate (currency/£)
Calendar year 2000:		
<b>Netherlands</b>	Guilder	3.0736
Calendar year 1999:		
<b>United States</b>	US\$	1.5267
July 99 – June 2000:		
<b>Australia</b>	A\$	1.9923

When we analyse operating costs using the purchasing power parity exchange rates, a different picture emerges. The figures in Table 56 show that the American and Australian unit costs remain lower than those for England and Wales and the Netherlands. These reflect the greater water consumption in these countries.

**Table 56 Costs per unit of water delivered based on purchasing power parity (pence/m<sup>3</sup>)**

	England and Wales	Australia	Netherlands	US
Cost of operations	31	25	56	28
Cost of capital maintenance	18	8	20	6
Return on capital	23	18	14	23
Abstraction tax	-	-	9	-
<b>Total cost</b>	<b>72</b>	<b>51</b>	<b>99</b>	<b>57</b>

This method of analysis shows Dutch operating costs to be the highest. When based on purchasing power parity, the overall costs per property of water delivered, as shown in Table 57, are similar for England and Wales, Australia and the Netherlands. They remain significantly higher in the US.

**Table 57 Costs per property of water delivered based on purchasing power parity (£/property)**

	England and Wales	Australia	Netherlands	US
Cost of operations	66	87	87	168
Cost of capital maintenance	38	29	32	37
Return on capital	46	63	21	134
Abstraction tax	-	-	14	-
<b>Total cost</b>	<b>150</b>	<b>179</b>	<b>154</b>	<b>339</b>

Table 58 shows that the analysis based on purchasing power parity closes the gap between the two countries' unit costs. The unit costs remain lower in Australia.

When expressed in £/property, the Australian costs of sewage collection appear higher than in England and Wales although the capital maintenance element is still lower (Table 59).

**Table 58 Costs per unit of sewage collected based on purchasing power parity (pence/m<sup>3</sup>)**

	<b>England and Wales</b>	<b>Australia</b>
Cost of operations	28	27
Cost of capital maintenance	24	14
Return on capital	45	23
<b>Total cost</b>	<b>97</b>	<b>64</b>

**Table 59 Costs per property of sewage collected based on purchasing power parity (£/property)**

	<b>England and Wales</b>	<b>Australia</b>
Cost of operations	50	81
Cost of capital maintenance	42	44
Return on capital	80	70
<b>Total cost</b>	<b>172</b>	<b>195</b>

## **Appendices**

### **1 Data comparability**

The data used in this report is based on trade association publications, annual reports and accounts as well as June Returns. It is important to note that information might not be on a comparable basis to that set out in the June Return that the Reporters audit.

#### **Operating expenditure data**

Operating expenditure may include work on capital equipment that a company's employees may undertake. We exclude such expenditure from our definitions and have, therefore, adjusted the Netherlands.

Costs associated with providing services other than the provision of water and sewerage supply to third parties may be included. These are separately identified in June Return tables. Costs associated with bulk supply arrangements may also be included. There may be an impact on unit cost calculations if costs associated with supplying properties outside the company's area are included. Although these would be included in England and Wales data, bulk supplies are more common in other countries.

Contracting out increases operating costs at the expense of capital maintenance and the return on capital component. This is particularly the case for Build, Own and Operate (BOO) and/or Private Finance Initiative (PFI) arrangements for treatment works. This applies equally to comparisons between England and Wales companies.

#### **Capital maintenance charges data**

Differing accounting standards will affect the level of the depreciation charge. Current cost accounts tend to increase the capital maintenance charge but may arguably be a more accurate way of recording the depreciation requirement. This is because historic cost depreciation fails to take account of inflation.

#### **Return on capital data**

The return on capital in this report represents a residual. It is, therefore, important that turnover is collected on a comparable basis. Turnover figures sometimes include income from sources other than those a company collects for the supply of water and sewerage services. In the main the problem relates to the treatment of capital expenditure items, new connections and possibly unread meters. The Netherlands' accounts include some capital items that a company's employees produce. These appear as both a turnover item (for which the company charges itself) and an operating cost item. Adjustments have been made to remove this where possible.

In Australia, revenue for new connections appears as a turnover item. Other countries treat this item as negative capital expenditure. Some adjustments have been made, but in others turnover and, as a result, the return on capital item may be overstated.

## **Water delivered data**

The water balance is important both in itself and for comparing costs. In England and Wales each component, including leakage, is estimated separately and then checked against top down estimates. Other countries, with comprehensive metering, take a different approach with one component (usually leakage) estimated as a residual. This has the risk that inaccuracies in other areas (e.g. meter under-registration or supply pipe leakage) may accumulate in the leakage estimate.

It is important to realise that other, more pressing; circumstances may influence leakage levels. For example, there may be a need to maintain a certain pressure level or resource position.

## **Properties served data**

Differences in interpretation affects the unit cost comparisons. How a company treats blocks of flats and other multi-household buildings is particularly important. Our June Return guidance states that companies treat such properties as non-households. Other countries may regard such properties as a single connection (resulting in very high per property usage) or as multiple households.

## **Financial indicators data**

The extent to which companies finance their assets rather, than just operate them, will affect the operating margin that a company requires. A low capital value allows a lower operating margin to be sufficient.

The other main difficulty is exceptional and atypical earnings, such as profits made on the disposal of land or other assets. These have been removed from the analysis wherever possible.

## **2 DG indicators**

### **DG2 Inadequate pressure**

The number of connected properties that receive during the year, and are likely to continue to receive, pressure below the reference level. The reference level is ten metres head of pressure at a boundary stop tap with a flow of nine litres per minute. This standard applies when demand for water is normal.

There are exceptions to this standard that allow for circumstances beyond a company's control. Customers' own plumbing, for example, may cause pressure problems. In reality, it is impractical to measure the pressure and flow at the boundary of every customer's property. Companies may therefore report against an alternative reference level of 15 metres head of pressure in the distribution main supplying the property.

Companies must maintain registers identifying those properties at risk of receiving low pressure.

### **DG3 Supply interruptions**

The number of properties experiencing interruptions to their supply of greater than 6, 12 and 24 hours which are the responsibility of the water company, but are neither planned nor warned. Companies can exclude incidents of supply interruptions that are:

- caused by a third party; or
- the result of planned maintenance work where customers were warned in advance.

Companies must maintain registers that identify those properties that supply interruptions affect.

### **DG5 Flooding from sewers**

Company performance in respect of internal sewage flooding of properties. Companies assess the risk of flooding due to sewer capacity using two categories of risk:

- more than once in 10 years; and
- twice in 10 years.

Companies also report on sewer flooding incidents in two causal categories – overloaded sewers, and other causes (temporary problems).

## **DG6 Billing contacts**

The total number of written and telephone billing contacts a company receives and the number dealt with in 5, 10, 20 and more than 20 working days.

A billing contact is any enquiry regarding a bill that is not a complaint (see DG7). Examples include an account query, change of address or request for alternative payment arrangements.

## **DG7 Written complaints**

The total number of written complaints a company receives and the number dealt with in 5, 10, 20 and more than 20 working days.

A written complaint is any letter, however mildly worded, that draws attention to a service or action of the company or its representatives, which falls short of what the correspondent expects. The total must include all complaints, including those about general levels of charging or other policy issues, and complaints that are not justified.

## **DG8 Bills for metered customers**

Percentage of metered customers who receive at least one bill during the year based on a meter reading undertaken by the water company or provided to the company by the customer (either in response to an estimated bill or as a result of a request to provide a meter reading).

## **DG9 Ease of telephone contact**

The ease with which customers can contact their local water company by telephone.

This monitors incoming telephone traffic on principal, advertised customer contact numbers that are linked to, for example, the customer service department or accounts section or the main switchboard. The indicator measures:

- the total number of calls a company receives on customer contact lines;
- the total number of calls the company answers;
- the number of calls the company answers within three time bands – within 15 seconds, 15 to 30 seconds and over 30 seconds;
- the average time taken to answer calls; and
- all lines busy – that is, inability to make contact with the company.

Company performance (Table 60) is set within three bands - good, acceptable, and needs improvement (for absolute assessments) or above average, average and below average (for comparative assessments). Regulatory action is taken against those companies recording a needs improvement or below average assessment.

**Table 60 Criteria for DG indicators**

<b>Indicator</b>	<b>Primary criteria</b>	<b>Secondary criteria</b>
<b>DG2</b>	<p><b>Above average:</b> &gt;50% better than the industry mean  <b>Average:</b> +/- 50% of industry mean  <b>Below average:</b> &gt;50% worse than the industry mean</p>	
<b>DG5</b>	<p><b>Above average:</b> &gt;25% better than the industry mean  <b>Average:</b> +/- 25% of industry mean  <b>Below average:</b> &gt; 25% worse than the industry mean</p>	
<b>DG3</b>	<p>Performance score (PS) based on percentage of connected properties subject to supply interruptions of &gt;6 hours, &gt;12 hours and &gt;24 hours.            PS calculated as ( &gt;6 hours x 1) + (&gt;12 hours x 1) + (&gt;24 hours x 2)</p> <p><b>Good:</b> &lt;0.5  <b>Acceptable:</b> 0.5-2.0  <b>Needs improvement:</b> &gt;2.0</p>	
<b>DG6</b>	<p>% of billing contacts answered within five working days</p> <p><b>Good:</b> &gt;95%  <b>Acceptable:</b> 90-95%  <b>Needs improvement:</b> &lt;90%</p>	<p>% billing contacts answered over 10 working days</p> <p>and &lt;1.5%            and &lt;3%</p>
<b>DG7</b>	<p>% of written complaints answered within 10 working days</p> <p><b>Good:</b> &gt;98%  <b>Acceptable:</b> 95-98%  <b>Needs improvement:</b> &lt;95%</p>	<p>% written complaints answered over 20 working days</p> <p>and &lt;1%            and &lt;1%            or &gt;1%</p>
<b>DG8</b>	<p>% of metered customers that receive a bill at least once a year based on a company or customer reading</p> <p><b>Good:</b> &gt;99.5%  <b>Acceptable:</b> 98-99.5%  <b>Needs improvement:</b> &lt;98%</p>	<p>% unread for two years by the company</p> <p>and &lt;0.15%</p>
<b>DG9</b>	<p>% of received calls answered within 30 seconds</p> <p><b>Acceptable:</b> =86%  <b>Needs improvement:</b> &lt;86%</p>	

### **3 Overall Performance Assessment**

The overall performance assessment was part of the 1999 periodic review. We wished to:

- compare the quality of the overall service that companies provided to customers;
- take this into account when setting price limits; and
- inform customers (and other interested parties) of the overall performance of their local water and sewerage company.

The overall assessment reflected the broad range of services companies provide to customers, showing the significantly better or worse performing companies. The key areas and contributing measures are:

#### **Water supply**

Water pressure, interruptions to supply, hosepipe bans, and drinking water quality.

#### **Sewerage service**

Sewer flooding incidents and risk of flooding.

#### **Customer service**

Written complaints, billing contacts, meter reading, telephone answering, telephone access, services to customers with special needs, meter options, supply pipe repairs, debt and disconnection policies, complaint handling, compensation, payment options, and customer information.

#### **Environmental impact**

Leakage, bathing waters, sludge disposal, sewage treatment works, combined sewer overflows, pollution incidents, and sea outfalls.

We used the results of this analysis, for 1996–97 to 1998–99, to adjust company price limits in the price determinations announced in November 1999. These adjustments rewarded the very best companies and penalised the worst, helping to maintain the incentives on companies to improve the services they offer to customers.

## 4 Water econometric models

Table 61 summarises the four water models for operating costs.

The overall water service operating efficiency assessment combines the results of the water service models including any adjustment for special factors.

**Table 61 Actual operating expenditure relative to that predicted by models**

Model	Explanatory Factors
Resources & treatment	Population, no. of sources, DI, proportion of supplies from rivers
Distribution	Population, proportion of total mains length with diameter >300mm
Business activities	No. of billed properties
Power	DI, Average pumping head

### Water distribution

The proportion of large mains to small mains is the most important cost driver in this model. Repairs, maintenance and inspection on large mains incur much greater costs than on small mains.

### Water resources and treatment

The explanatory variables of population, number of sources, distribution input and the proportion of supplies from rivers are taken into account.

These ensure that efficiency bands take into account economies of scale at source level (costs will be lower if fewer sources are used) and the difficulty of treatment (river supplies will generally be more expensive to treat).

### Water power model

For most companies, power expenditure is almost entirely for pumping, although there are some water treatment processes which are energy intensive.

The model takes the effects of terrain into account (companies in hilly areas will require more power to move water around), and the significant economies of scale associated with high power consumption.

### Business activities model

Business activities include customer services and scientific services and the charge for doubtful debts.

The model takes into account the economies of scale that are associated with high volume billing and customer service activities.

Table 62 summarises the four water models for capital maintenance.

**Table 62 Actual capital maintenance expenditure relative to that predicted by models**

<b>Model</b>	<b>Explanatory variables</b>
Water resources and treatment:	Connected properties, proportion of distribution input from surface water sources
Distribution infrastructure:	Length of main, burst rate, proportion of communication pipes that are lead
Distribution non-infrastructure	Pumping station capacity, service reservoir and non-infrastructure water tower capacity
Management and general	Billed properties, proportion of billed properties that are non-household

**Water distribution infrastructure**

The burst rate of mains is the most important cost driver in this model. Companies with higher burst rates might expect to incur higher costs in maintaining their distribution networks. A second explanatory variable, the proportion of communication pipes that are lead, helps to explain the additional costs associated with the opportunistic replacement of lead communication pipes when replacing mains.

**Water resources and treatment**

The proportion of treated water taken from rivers is the key explanatory factor of this model. It explains the higher maintenance costs of companies that treat mainly surface water (which generally requires more sophisticated treatment processes).

**Water distribution non-infrastructure**

This model takes account of water tower and service reservoir capacity. The ratio of storage capacity to pumping station capacity helps to explain the higher costs of companies with relatively greater storage capacity.

**Water management and general**

The key cost driver in this model is the proportion of billed properties that are non-household. The model explains the higher unit costs that companies incur when faced with a greater number of business customers. Metering and billing requirements will be higher. Adding together, and comparing, the results of the models provide an overview of each company's overall water service efficiency. As with operating expenditure, company-specific factors are taken into account.

Operating efficiency models were re-estimated using 1999–2000 data. The capital maintenance models were also updated to incorporate a seventh year of expenditure data and to take into account different accounting practices between companies.

Even allowing for the explanatory factors taken into account in the econometric modelling, the operating costs of the least efficient companies are considerably higher than the most efficient companies.

The least efficient companies in Band D would need to reduce water service operating costs by about 30% to move to Band A. A company in Band E for capital maintenance would need to reduce their costs by about 35% to move to Band A.

Within these operating and capital maintenance efficiency bands, the level of service provided by each company varies. One way to assess performance is to compare the efficiency results with those in the corresponding year of the Ofwat publication 'Report on levels of service for the water industry'. There is evidence that good standards of customer service do not necessarily require higher costs.

### **Special factors**

The econometric models take into account factors that describe the size or operating environment of different companies. But, there are other factors that are company specific and cannot be incorporated into an econometric model. Such company-specific special factors typically lead to higher operating or capital maintenance costs that are outside management control. Legal requirements or circumstances peculiar to an individual company's area of operation are examples of such special factors.

Companies submitted claims for special factors individually as part of the 1999 Periodic Review process. We reviewed these claims and, where justified, made adjustments to the relative efficiency assessments. Companies had to provide verifiable costs. The most significant types of special factors allowed in the assessments of relative efficiency at the 1999 Periodic Review were:

- unusual water resources and treatment costs;
- unusual sludge and sewage treatment costs;
- legal requirements;
- high level of meter penetration;
- costs of operating in London and the surrounding area;
- scale of sewerage service business activities;
- industrial customers;
- summer peak demand; and
- regional power costs.

## 5 Information quality

Companies must provide reliable and accurate information if meaningful comparative assessments are to be made. The quality of information has improved markedly in recent years but we continue to work with companies and Reporters to improve the consistency and comparability of information. Our aim is to encourage improvement in the reporting of data by all companies. We wish to be able to differentiate between companies who achieve a high level of performance, based on sound information, and those companies whose performance is based on less reliable data.

### Confidence Grades

The reliability and accuracy of information submitted to Ofwat is assigned a confidence grade. These have two parts: a reliability band reflecting how companies gather data and a number indicating its likely range of error.

### Data reliability bands

**A** Sound textual records, procedures, investigations or analysis properly documented and recognised as the best method of assessment.

**B** As A, but with minor shortcomings. Examples include old assessment, some missing documentation, some reliance on unconfirmed reports, some use of extrapolation.

**C** Extrapolation from limited samples for which Grade A or B data is available.

**D** Unconfirmed verbal reports, cursory inspections or analysis.

### Accuracy bands

**1**  $\pm 1\%$

**2**  $\pm 5\%$

**3**  $\pm 10\%$

**4**  $\pm 25\%$

**5**  $\pm 50\%$

**6**  $\pm 100\%$

**X** For very small numbers where accuracy cannot be calculated or the error could be more than 100%.

Information for some measures of service is much more difficult to obtain than for others. Thus confidence grades might appear to be much better for some measures compared to others. We expect companies to achieve a high degree of accuracy (B2 or better in most cases) for measures which involve simple tasks such as counting the time taken to respond to letters.

On the other hand it would be unreasonable to expect the same level of accuracy for those measures requiring detailed knowledge of the sewerage or water distribution systems. Generally, we would consider a company to be doing well if it provides reliable information (B) to an accuracy of 10% or better (B3).