Future water and sewerage charges 2005-10

Final determinations

OFWAT

Periodic review 2004

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Price base

Figures quoted in this report are expressed in 2002-03 prices except for customers' bills. Customers' bills are presented in current prices in line with the bills customers have received for 2004-05.

In their business plans companies prepared their bill projections in financial year average 2002-03 prices, as specified in our reporting requirements.

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Foreword

This report sets out my determinations of price limits for the water and sewerage companies in England and Wales from April 2005 to March 2010. They have been prepared in accordance with all of my statutory duties. They are the product of careful collective consideration within Ofwat. They are therefore referred to throughout this report as 'our' determinations. The non-executive advisory directors on the Ofwat Board have been party to the process and they support the outcome.

We have made judgements about what resources each company needs to finance and carry out its functions properly, assuming that it improves its efficiency year by year in line with our efficiency factors. We have taken account of the interests of customers and of the wider environment. Although the price limits run only to 2010, we have reflected in them the need for the water industry to continue to provide essential water services for the foreseeable future.

We have taken as our starting point each water company's final business plan. In reaching our view we have been helped by the guidance given by the Secretary of State for Environment, Food and Rural Affairs for England and the Welsh Assembly Government for Wales; by research jointly undertaken with other stakeholders on customers' views and priorities and submissions from the WaterVoice Committees; by work undertaken by the Drinking Water Inspectorate, the Environment Agency, English Nature and the Countryside Council for Wales on the outputs required of the companies; by the work of the independent reporters for each company; and by the reports of a number of consultants commissioned by Ofwat and by other stakeholders.

We published for consultation our draft determinations in August so that the companies and other stakeholders could consider them and make their representations. I met each WaterVoice Committee and each company to understand their concerns. Ministers provided final guidance, endorsing the inclusion of some discretionary work for England and confirming the exclusion of further work in Wales. The quality regulators, the Environment Agency, English Nature and the Drinking Water Inspectorate have had full access to our detailed decisions to enable them to help us clarify future work programmes.

We have considered all of the representations made on our draft determinations and have taken them, together with the most up-to-date factual information available to us, into account in our final determinations.

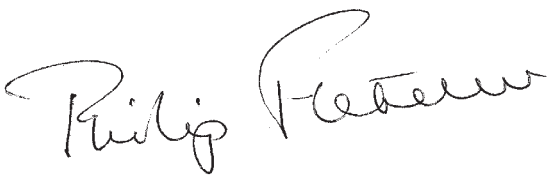
We judge that an increase in price limits is essential to maintain the progress in service quality and performance which has already been achieved and to make the further advances required. The price limits are as high as they need to be to enable each company to provide these services. But they are no higher than they have to be for customers, who in general have no choice about their supplier. Our price limits have been prepared on a consistent basis, but do take account of each company's circumstances and accordingly vary considerably from one company to another.

In general terms we are content with the strategies proposed by companies. However, following scrutiny and challenge we consider that the companies have in general tended to overestimate the costs of their strategies and underestimate the scope for further improvements in efficiency. This challenge explains why we have been able to determine price limits that are only around two-thirds of the increase that companies sought.

In conducting the review, we have adopted a transparent process. We have followed the methodological approach that we set out in March 2003. We have explained our reasoning in general terms in this report, supplemented by a confidential, detailed report that we have provided to each company.

Inevitably during 2005 to 2010 there will be new challenges to meet. Each company's licence has provisions for interim price limit reviews in cases where there are specific material changes in circumstances that are not reflected in our determinations. We have taken a neutral stance on interim price reviews, neither allowing contingencies in price limits for future changes nor setting our assumptions and expectations at levels that presuppose the need for interim reviews.

Each company must decide by 1 February 2005 if it wants me to refer its determination to the Competition Commission for redetermination. Whether or not a reference is made to the Competition Commission, our determinations will apply to the charging year beginning 1 April 2005. The Competition Commission would review all the available evidence in reaching its own determinations, which could lead to changes to the price limits we set for those companies that appeal.



Philip Fletcher
Director General of Water Services

Key points – England and Wales

Effect on customers' bills

- Price limits of 4.2% a year on average for five years (before inflation) – one-third less than that sought by companies. Average household bills up by £46 (18%) from £249 to £295 over five years (before inflation). This compares with the companies' proposals for an average increase of £72 (29%).
- Increase in bills needed to finance substantial (£16.8 billion) capital programme for further environmental and service improvements, and higher costs faced by companies.
- Increase of 8.5% in bills, on average, in April 2005 – almost half the overall increase – to reflect current levels of companies' costs. The companies sought on average a 12% increase in 2005.

Benefits

- All current essential services safeguarded for customers and the environment – this requires a bigger programme to maintain pipes, sewers and treatment works for the future.
- Safe and more reliable supplies of drinking water – achieved through further improvement projects in water quality and security of supply.
- Further protect the environment – achieved through a major programme of work to deliver tighter standards at over 1,000 sewage treatment works, and improve over 2,000 overflows from the sewerage system. This will improve our rivers and coastal waters, and includes 379 investigations to inform decisions on future environmental protection.
- More than 95% of companies' and ministerial proposals included in price limits. Some proposals not included as yet, where we consider they are not fully justified.
- A programme of nearly £1 billion to safeguard homes against the risk of sewer flooding. This would resolve or mitigate every known high-risk problem of internal flooding from overloaded sewers where companies' plans said action is needed by 2010. By then, the proportion of properties at risk would reduce to 0.01% of households.

Effect on companies

- We have scrutinised each company's business plan thoroughly and all representations on our draft determinations (more than 500) have been considered.
- Demanding but achievable efficiency challenges (eg operating cost efficiencies of 1.4% each year for water and 1.3% for sewerage) assume that all companies, especially the less efficient, will improve further and faster than the economy as a whole. There is scope for all companies to outperform our assumptions. And there are improved incentives for the best performers to become more efficient.
- Financing assumptions that are appropriate for efficient companies to maintain access to the capital markets (eg post-tax cost of capital of 5.1%). Regulatory capital value is estimated to rise from just under £35 billion to almost £41 billion.
- We have set price limits that we consider will enable each company to carry out and finance its functions, meeting all the requirements set out above. **Price limits are as high as they need to be but no higher than they have to be.**

Price limits (%)

	2004-05		2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determinations	3.4		9.6	3.9	3.2	2.5	2.0	4.2
Companies' business plans	3.4		13.4	7.1	4.6	3.4	2.9	6.2

Customers' bills

Expected effect on household bills		2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Average annual household bill	Water (£)	117	130	134	137	139	140
	Sewerage (£)	132	140	144	148	152	155
	Total (£)	**249**	**270**	**278**	**285**	**291**	**295**

What is driving the changes in bills?

Average household bill in 2004-05		**£249**
Less	(1) past efficiency savings and outperformance	**(3)**
	(2) scope for reduction through future efficiency improvements	**(13)**
Plus	(3) maintaining base services	**18**
	of which (a) changes in revenue	(6)
	(b) changes in operating costs	10
	(c) changes in capital maintenance	7
	(d) changes in impact of taxation	5
	(e) financing	2
	(4) maintaining security of supplies to all customers	**11**
	(5) the impact of improvements in services	**33**
	of which (a) drinking water quality	9
	(b) environmental improvements	21
	(c) service performance	3
Average household bill in 2009-10		**£295**
Change from 2004-05 to 2009-10		**£46**

Capital investment assumptions 2005-10

	Water	Sewerage	Total
	£ billions	£ billions	£ billions
Capital expenditure[1] (five-year total)			
Capital maintenance	4.2	4.2	8.4
Supply/demand balance	1.7	0.6	2.3
Quality enhancements	2.1	3.4	5.5
Enhanced service levels	–	0.6	0.6
Total	**8.0**	**8.8**	**16.8**
£ per property	341	391	732

1 Capital expenditure is net of capital contributions.

Part I. Final determinations – summary

1. Our proposed price limits

This report summarises the outcome of our review of price limits for the 23 water companies in England and Wales for the period April 2005 to March 2010. It explains how we have arrived at our conclusions.

In October 2002, we published our timetable for this review and consulted on our approach. Following this consultation, we published our methodology paper, 'Setting water and sewerage price limits for 2005-10: Framework and approach', in March 2003.

To set price limits we need to understand the costs each company will incur to run its business and the revenues it will need to collect to finance it. The companies submitted their draft business plans in August 2003 and we published 'Setting water and sewerage price limits for 2005-10: Overview of companies' draft business plans' in October 2003. We worked with the companies, the quality regulators and the Government to determine what the companies will be required to deliver in the period 2005-10. In March 2004 the Secretary of State for Environment, Food and Rural Affairs and the Welsh Assembly Government published their principal guidance setting out the drinking water quality and environmental improvements they wished the companies to make.

The companies submitted their final business plans to us in April this year, setting out the price limits they consider they need. We scrutinised each company's proposals thoroughly and published our draft determination of price limits in 'Future water and sewerage charges 2005-10: Draft determinations' in August 2004 for consultation. This set out our initial views on the price limits the companies need for the period 2005-10.

Ministers provided their final guidance in October 2004. This clarified the environmental and drinking water quality outputs the companies are expected to deliver in 2005-10. In our draft determinations, we excluded a number of projects where we considered that further work needed to be undertaken to specify the requirements and costs. The Environment Agency, English Nature and the Drinking Water Inspectorate (DWI) have worked closely with the companies and us to do this and consequently our final determinations include more of these schemes.

In this monopoly industry we rely heavily on comparative competition. We assess how fast the industry can improve its performance within the economy at large. We compare each company's relative performance with that of other companies in the industry and make judgements about the speed and extent to which it can catch up with the performance of the best. This allows us to assess what each company can deliver over the period and within what price limits. We have taken a fair and consistent approach to each company's business plan, based on our published methodology and each company's individual circumstances.

Our final determination of price limits reflects a number of changes as a result of new information that has become available and some refinements to our approach in response to the representations.

1.1 Price limits

Our determinations of price limits for the period 2005-10 would mean an annual average price limit of 4.2% before inflation. The price limits for each company are set out in table 1. These price limits should enable companies to deliver their outputs, but are no higher than they need to be in the interests of customers.

Table 1 Price limits for 2005-06 to 2009-10

	Annual price limits					
Company	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**Average[1]**
Water and sewerage companies (WaSC)						
Anglian	3.8	0.0	2.8	2.7	2.7	2.4
Dŵr Cymru	14.2	3.6	4.1	3.3	2.2	5.4
Northumbrian	6.5	3.7	3.2	1.0	0.6	3.0
Severn Trent	11.8	4.8	2.0	1.7	2.3	4.5
South West	12.5	9.8	9.8	1.7	1.4	6.9
Southern	12.6	3.9	3.5	5.8	2.6	5.6
Thames	14.9	2.1	1.2	1.3	1.5	4.1
United Utilities	5.0	6.4	4.4	3.5	3.0	4.5
Wessex	8.9	4.9	5.6	4.0	2.9	5.2
Yorkshire	5.5	4.9	3.6	3.6	2.1	3.9
WaSC average (weighted)	**9.4**	**4.0**	**3.4**	**2.7**	**2.2**	**4.3**
Water only companies (WoC)						
Bournemouth & W Hampshire	15.9	2.2	1.6	-0.6	-2.4	3.1
Bristol	13.8	2.8	1.5	0.7	-2.3	3.2
Cambridge	11.8	1.6	0.3	-0.8	-0.3	2.4
Cholderton[2]	7.0	7.0	5.6	0.0	0.1	3.9
Dee Valley	5.7	-1.4	0.2	0.6	-0.7	0.8
Folkestone & Dover	8.3	7.3	4.0	1.9	2.6	4.8
Mid Kent	9.0	0.5	1.9	2.6	2.7	3.3
Portsmouth	-0.7	-0.6	1.5	2.5	1.0	0.7
South East	15.8	2.3	2.2	0.5	-1.6	3.7
South Staffordshire	9.9	2.5	1.7	1.0	1.3	3.2
Sutton & East Surrey	12.9	2.0	1.1	-1.0	-1.1	2.7
Tendring Hundred	-1.8	-0.7	0.6	-0.3	-0.5	-0.5
Three Valleys	15.3	1.8	1.2	-0.2	0.1	3.5
WoC average (weighted)	**12.4**	**1.9**	**1.5**	**0.4**	**-0.3**	**3.1**
Industry average (weighted)	**9.6**	**3.9**	**3.2**	**2.5**	**2.0**	**4.2**

1 The average for the price limits is the geometric average of the annual price limits.

2 Cholderton is an exceptionally small company. Price limits have been set, but other than in this table, table 4 and its company-specific table in chapter 7, Cholderton is not included in tables in the remainder of this document. It does not have a material effect on the industry averages.

The increases customers will face vary from company to company. The price limits range from 2.4% a year, on average, for Anglian, to 6.9% for South West among the water and sewerage companies. For the water only companies the range is from an average reduction of 0.5% a year for Tendring Hundred to an increase of 4.8% a year for Folkestone & Dover.

The increases in the price limits are greatest in the first year, 2005-06. This reflects the costs faced by the companies. For the industry as a whole price limits will rise by 9.6% in that year. The size of the increase then reduces year-by-year for the remaining four years. Five water and sewerage companies and six water only companies will have price limit increases of more than 10% before inflation in the first year.

The price limits we have set are lower than those proposed by companies in their business plans. On average, they sought annual price limits of 6.2% before inflation, 2% more than the limits of 4.2% included in our final determinations.

Our price limits reflect the costs the companies face. The main influences are:

- increased running costs arising from changes to taxation, pension and energy costs and legislative changes;
- increased activity necessary to maintain the asset network and improve security of supply to ensure no deterioration in services;
- further improvements to drinking water quality and the environment required by Ministers; and
- significant reductions in sewer flooding.

Table 2 compares our final determinations at an industry level with the average price limits included in the companies' business plans. In chapter 4 we set out for each company how its business plan compares with our final determinations.

Table 2 Comparison of industry average price limits with companies' business plans for 2005-10

Price limits	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Water and sewerage companies (weighted average)						
Business plans	13.1	7.1	4.7	3.6	3.1	6.3
Final determinations	9.4	4.0	3.4	2.7	2.2	4.3
Water only companies (weighted average)						
Business plans	16.7	6.8	2.7	1.2	0.9	5.5
Final determinations	12.4	1.9	1.5	0.4	-0.3	3.1
Industry (weighted average)						
Business plans	13.4	7.1	4.6	3.4	2.9	6.2
Final determinations	9.6	3.9	3.2	2.5	2.0	4.2

1.2 Changes from the draft price limits

In August 2004 we published our draft determinations of price limits. Table 3 compares our final determinations to our draft determinations. At the industry level, our final determinations are 1% higher per year on average than the draft ones.

Table 3 Final determinations compared to draft determinations

	Average annual price limits 2005-06 to 2009-10 (%)		
Company	**Draft determination**	**Final determination**	**Difference**
Water and sewerage companies			
Anglian	1.5	2.4	0.9
Dŵr Cymru	4.5	5.4	0.9
Northumbrian	1.5	3.0	1.5
Severn Trent	3.5	4.5	1.0
South West	5.6	6.9	1.3
Southern	4.0	5.6	1.6
Thames	3.0	4.1	1.1
United Utilities	3.5	4.5	1.0
Wessex	4.2	5.2	1.0
Yorkshire	3.3	3.9	0.6
WaSC average (weighted)	**3.3**	**4.3**	**1.0**
Water only companies			
Bournemouth & W Hampshire	2.6	3.1	0.5
Bristol	2.6	3.2	0.6
Cambridge	1.8	2.4	0.6
Dee Valley	0.5	0.8	0.3
Folkestone & Dover	3.3	4.8	1.5
Mid Kent	0.7	3.3	2.6
Portsmouth	-0.5	0.7	1.2
South East	2.9	3.7	0.8
South Staffordshire	2.5	3.2	0.7
Sutton & East Surrey	1.6	2.7	1.1
Tendring Hundred	-1.4	-0.5	0.9
Three Valleys	2.8	3.5	0.7
WoC average (weighted)	**2.2**	**3.1**	**0.9**
Industry average (weighted)	**3.2**	**4.2**	**1.0**

We received more than 500 representations on our draft determinations (appendix 1 provides information on the types and numbers of respondents). We also met each company and the WaterVoice Committees to hear their views on our draft decisions. The representations are summarised in chapter 5 and will be published in full (other than, by exception, where the author required confidentiality) on our website (www.ofwat.gov.uk). Our website will also include a table summarising the responses, who made them and how we have responded to the points raised.

In early October we received the final ministerial guidance on the expected quality improvements.

Our final determinations will lead to an annual average price limit of 4.2% compared with an annual average price limit of 3.2% included in our draft determinations. The first year price limit in 2005-06 will be 9.6%, an increase of 1.8% compared with our draft determination of 7.8%.

The changes between our draft and final determinations are particularly marked for Northumbrian, Southern, Folkestone & Dover and Mid Kent, where the average final price limits over the five-year period have risen by 1.5% or more compared with the draft price limits.

A number of items are contributing to the changes between our draft and final determinations. We have made a great many detailed changes which affect individual companies. Most of these have a very small effect on price limits. The issues which have a more significant overall general effect are:

- an increase in the capital programme of £1.1 billion to reflect additional quality improvement schemes, maintenance and greater investment to reduce the risk of sewer flooding;

- a reassessment of the efficiency assumptions for operating costs in the sewerage service;

- new information on current trends in energy and pension costs;

- clarification and new information from each company on issues specific to them; and

- recognition as notified items of potential risks from changes to water companies' taxation and charges in respect of abstractions and discharges from the Environment Agency and others.

In response to demands from customers and companies, we have increased the investment allowed in price limits to deal with properties at risk of sewer flooding. This was a high priority for all of the WaterVoice Committees and each of the sewerage companies. As a result, our price limits allow for measures to reduce the risk or impact of sewer flooding for each existing high risk problem where overloaded sewers cause flooding which companies proposed to resolve, including capital solutions for the vast majority of cases.

In our draft determinations, we excluded a number of environmental and drinking water improvement schemes that we considered were insufficiently clear and where further work was required to determine the costs of these schemes. As a result of further work by the Environment Agency, English Nature, the DWI and the companies on specifying the outputs and costs, we have included more of these schemes in our final price limits, as well as the majority of those schemes on which particular emphasis was laid in the final guidance from Ministers.

We have not changed our views on the cost of capital for the industry compared with the draft determination. However, the larger capital programme in our final determinations has exacerbated the financial constraints companies face if they are to maintain an adequate financial position in the last three years of the period. For this reason, price limits are higher than they would otherwise have been in order to maintain financeability in those years.

We have maintained the principles and approach underlying our assumptions on the future efficiency gains achievable by the companies over the period. This is explained in more detail in chapters 5 and 10. Our efficiency assumptions for the period 2005-10 continue to be demanding. However, we have revised our assessments in the light of the latest information in companies' annual returns. We also accepted representations from the sewerage companies that it is inappropriate to use Thames as a benchmark company for sewerage efficiency. This is because of the special factors in its operating environment that advantage that company in disposing of wastewater from London. The new benchmark will mean slightly less demanding assumptions in the sewerage service on the catch-up necessary by the less well performing companies.

We have allowed a higher level of operating costs than we did in our draft determinations. This is in response to concerns about the upward pressures on operating costs resulting from increased pension contributions, energy prices and property rates, together with other new information not available in companies' final business plans.

1.3 Increases in customers' bills

The price limits control average bills. Overall, companies proposed an increase of 29% in average household bills by 2009-10, which would have required an increase of £72 in real terms (ie before adjusting for general inflation) on the average bill in 2004-05. The price limits now set will mean that the average household customer will pay around £46 more in real terms by 2009-10 than in 2004-05, an increase of around 18%. This is less than two-thirds of the increase in bills sought by the companies.

Average household bills will rise by 8.5% in the first year 2005-06 for the industry as a whole – around half of the total five-year increase. Companies wanted an increase of 12% on average. The profile of bills is discussed further in section 1.4.

Table 4 sets out the average expected household bills for individual companies. Although price limits have been prepared on a consistent basis for all companies, the level of increase will vary according to the circumstances of each company and the outputs it is required to undertake over the next five years.

At the last review of prices in 1999, we were able to reduce customers' bills on average, mainly by taking account of the large efficiency improvements which the companies achieved in the late 1990s. These have not been repeated over the last five years. But this means, taking account of this reduction, average household bills will have increased by only around £20 or 7% (in real terms) over the decade from 1999-2000 to 2009-10. Taking an even longer perspective, over the 20 years since privatisation in 1989, bills will have increased by 42% before inflation, in real terms around 1.8% a year.

All customer groups are predicted to spend more as a proportion of their income on water and sewerage bills in 2009-10 than in 2004-05. However, this will still be less than the proportion of disposable income spent on water and sewerage charges before 1999-2000.

The increase in average household bills is less than that suggested by the price limits for 2005-10. Average household bills will rise by 18% but the cumulative price limit increase is 23%. This is because during the period some customers will switch from an unmeasured to a measured supply to save money. Price limits need to be higher than the rise in average household bills to allow for the loss of revenue that companies experience because of this switching.

The average household bill is, by definition, an average across all customers. Individual customers' bills may rise by more or less than the average because of their particular characteristics, for example whether they have a measured or unmeasured supply. We have set out later in this report, changes in 'typical bills' for customers with typical characteristics, particularly distinguishing measured and unmeasured charges. In appendix 2 we also set out a number of illustrative examples of bill changes for customers with differing consumption levels or rateable values.

Regional effects

Changes to customers' bills will vary according to which company supplies them. Customers of South West, Southern and Wessex would see the largest percentage increase in their bills, 25% on average over the five-year period.

Customers of Anglian would see more modest changes in their bills over the period, with increases of only 7%, and those of Northumbrian around 12%. Customers of Northumbrian have, however, faced higher bills in 2004-05 than set in 1999. The company sought an uplift in its price limits for that year to meet the additional costs it faced. The price limit for 2004-05 was increased from nil to 10%. United Utilities also sought an uplift to its price limits for 2004-05, the price limit we set was 8.9%.

For the water only companies, customers' bills for Folkestone & Dover would rise by 23%, but those for Tendring Hundred and Dee Valley would fall by 2% and 1% respectively.

The combined bill for South West is expected to be £444 by 2009-10. This is significantly higher than the next highest of £352 for Dŵr Cymru.

Table 4 Average expected household bills[1]

Company	Average annual household bills (£)[2]							
	2004-05		2009-10		Change			
	Water	Sewerage	Water	Sewerage	Water	Sewerage	Total	% change
Water and sewerage companies								
Anglian	122	172	140	173	18	1	20	7
Hartlepool	94	–	108	–	14	–	14	15
Dŵr Cymru	123	163	153	199	30	36	65	23
Northumbrian	100	132	114	146	14	14	28	12
Essex & Suffolk	132	–	153	–	21	–	21	16
Severn Trent	116	105	133	132	16	27	43	20
South West	126	231	179	265	53	34	87	25
Southern	91	168	110	214	19	46	65	25
Thames	113	98	156	104	44	7	50	24
United Utilities	133	136	147	175	14	39	53	20
Wessex	126	151	170	177	44	26	70	25
Yorkshire	117	126	133	155	17	28	45	18
WaSC average (weighted)	**118**	**132**	**142**	**155**	**24**	**23**	**47**	**19**
Water only companies								
Bournemouth & W Hampshire	107		122		15		15	14
Bristol	108		122		14		14	13
Cambridge	91		101		10		10	11
Cholderton	136		166		30		30	22
Dee Valley	107		106		-1		-1	-1
Folkestone & Dover	143		176		33		33	23
Mid Kent	131		151		19		19	15
Portsmouth	77		80		4		4	5
South East	129		151		21		21	16
South Staffordshire	91		106		15		15	17
Sutton & East Surrey	127		143		16		16	13
Tendring Hundred	162		158		-4		-4	-2
Three Valleys	118		138		20		20	17
WoC average (weighted)	**113**		**129**		**16**		**16**	**14**
Industry average (weighted)	**117**	**132**	**140**	**155**	**23**	**23**	**46**	**18**

1 This table is quoted in 2004-05 basket year prices. All other figures quoted in this document are in 2002-03 financial year average prices unless otherwise stated.

2 The actual impact on customers' household bills will also be governed by companies' approved charges schemes.

1.4 The profile of bills

The customer research we undertook with others indicated that most customers would prefer that, where possible, increases in bills are brought in gradually to allow customers to adjust their budgets accordingly. Several WaterVoice Committees made this point in their representations. Companies, on the other hand, have indicated a strong preference for observing the principle that their income should in general match expected costs in a given year. We have considered these preferences fully. Overall, we have concluded that we should maintain the general principle that the revenues that companies can raise reflects their expected costs in a given year for the final determinations. This means that it is essential in most cases to allow a significant part of the increase, nearly half of the five-year total on average, to take effect in April 2005.

Price limits are in general so much higher in the first year because this is the first opportunity to adjust price limits for the costs which companies have incurred over the last five years. These include factors such as the climate change levy and National Insurance contributions. In addition, several important changes which affect price limits come into effect from April 2005. These include a more onerous corporation tax regime, and the impact of the revaluation of the rating system. The increased cost of companies' pension schemes and the impact of rapid increases in wholesale energy costs have also been taken into account. Part II of this report provides more information about each of these and other factors. The extent to which companies have outperformed our assumptions at past reviews and improved their efficiency has helped to mitigate the impact of these increases in costs, but has not offset them fully. Chapter 2 provides more detail on each of the factors influencing the future level of bills.

We have considered whether costs and outputs could be phased to later in the five-year period to mitigate the impact of rising bills in 2005, without jeopardising the level of service that companies provide. This has only been possible to a limited extent. For example, we have concluded that it would not be appropriate to assume that changes could be made to the implementation dates of schemes set up under statutory agreements between the water companies and the DWI for essential improvements.

Smoothing price limits without deferring costs means bills are higher at the end of the five-year period because less revenue is collected in the early years and more is required in the later years. In addition, where a company's costs in a year exceed revenues, this would tend, in most circumstances, to increase the perceived risk for that company of failing to fulfil its financial obligations. Lenders and investors would assess the risk accordingly and require an appropriate premium to compensate for it, adding still further to customers' bills. For example, if the increase implied by final price limits were smoothed evenly over the five years, we estimate that the overall increase required by 2009-10 would be around 25% rather than 18% – an increase of 7% due to smoothing alone. This is without assuming any additional revenue to compensate for risk – the increase would be even higher if this were included. This point was not made clear to customers in the market research.

South West, Bournemouth & West Hampshire, Cholderton and Folkestone & Dover have asked us to undertake a limited smoothing of their final price limits. This is to moderate the effect of the very sharp increase that would otherwise be due in April 2005 and allow their customers to adjust to the new levels of bills. We accepted that some smoothing is appropriate for these companies as they are prepared to manage any additional risk to which they may be exposed.

1.5 What will companies achieve for the price limits we have set?

We have reviewed each company's strategy with a focus on what it proposed to deliver over the 2005-10 period. For the most part we have been able to endorse the strategies and associated outputs. Delivery of these strategies does require a further substantial investment programme.

Our price limits assume increased levels of investment by nearly all companies to maintain their assets. They also include significant further investment on improving drinking water quality and the environment to address the final guidance from Ministers.

Our determinations also assume that companies will reduce the numbers of properties at risk of flooding from sewers and improve water pressure, taste, odour and hardness of drinking water for some affected customers. Companies will also be able to undertake more activity to maintain the balance between supply and demand so that new and existing customers' demand for water and sewerage services continues to be met adequately.

We assess each company against the delivery of the output requirements, not on how much money it spends. If a company outperforms our cost assumptions but delivers the required outputs then it will benefit; conversely if it underperforms then it will have to carry the extra costs.

To allow the companies to maintain current services and meet new obligations we have assumed in our price limits a capital investment programme of almost £17 billion over the five years. This is shown in table 5. This compares with the £21 billion (net of capital contributions) sought in the companies' business plans.

The main differences relate to the exclusion of quality and service improvement schemes that require further consideration (£0.5 billion), a higher level of efficiency savings than assumed by the companies (£1.0 billion) and a reduction in the required outputs (£2.4 billion) – including a slower rate of increase in capital maintenance expenditure.

Table 5 Capital investment assumptions 2005-10

	Final determinations		
	Water £ billion	**Sewerage £ billion**	**Total £ billion**
Capital expenditure[1] (five-year total)			
Capital maintenance	4.2	4.2	8.4
Supply/demand balance	1.7	0.6	2.3
Quality enhancements	2.1	3.4	5.5
Enhanced service levels	–	0.6	0.6
Total	**8.0**	**8.8**	**16.8**
£ per property	341	391	732

1 Capital expenditure is net of capital contributions.

In our draft determinations we assumed total capital expenditure over the five-year period of £15.7 billion. The capital programme in our final determinations is £1.1 billion or 7% higher. Final price limits allow for further investment to relieve sewer flooding (an increase of

£0.3 billion) and further quality improvements (an increase of £0.4 billion), with smaller increases in capital maintenance and the supply/demand balance.

Maintaining services and the companies' assets

Companies must ensure that there is no deterioration in service to customers or in the level of compliance with their environmental consents and licences. Our price limits assume that the current levels of service to customers will, as a minimum, be maintained. This means compliance with drinking water quality regulations and the levels of service indicators and other measures that we use to assess each company's performance. Compliance with environmental consents and licences also covers abstraction from and discharges (continuous and intermittent) to the water environment.

Adequate maintenance of the asset system is essential to ensure continuing services to customers both now and into the future. Companies must sustain stable serviceability – fitness for purpose – throughout the period and beyond. Where the current position is not satisfactory we have assumed that the company will have achieved stable serviceability by the end of 2008-09 or earlier where specified. This includes maintenance of the sewerage systems to deal with newly emerging sewer flooding problems, as well as some schemes to reduce odour nuisance at sewage treatment works.

We have worked with the industry to develop an improved framework for assessing capital maintenance needs. We are pleased with the progress made by the companies. We have reviewed each company's plan to assess what it needs to maintain the serviceability of its assets.

Companies will have spent around £7.5 billion in 2000-05 (including an estimate for 2004-05) on maintaining their assets. The industry sought £9.4 billion for the 2005-10 period. We have assumed that companies will invest £8.4 billion on maintenance in the next period. This is a 22% increase over that assumed at the last review, and a 13% increase on estimated expenditure during the period 2000-05.

Maintaining the balance between supply and demand

Our price limits assume that companies can: meet all changes in demand for water both from new and existing customers; promote the efficient use of water by customers; install and operate optional meters; and ensure that leakage is kept at the economic level. Where the current security of supply position is not adequate we have assumed that the company will make the required improvements either by reducing leakage to the economic level, enhancing demand management, or commissioning new sources to the timetables set out in our determinations.

Our price limits assume that companies will need to invest £2.3 billion (or £3.1 billion gross of capital contributions) to ensure that the supply of water meets essential demands and that companies' sewerage systems can deal with the increased volume of sewage. This includes extending and upgrading the sewerage systems to deal with newly emerging problems of regular flooding from overloaded sewers in all but exceptional rainfall events. This is around a 60% increase compared with the last review. Companies included £3.3 billion (or £4.1 billion gross of capital contributions) to maintain the balance between supply and demand in their business plans.

Quality and environmental improvements

In total, companies will have invested nearly £25 billion from 1990 to 2005 on improving drinking water quality and the environment.

Our price limits assume that the industry will invest around £5.5 billion for new quality and environmental expenditure following our challenges to the companies' proposals of £6.9 billion. Our determinations include almost all of the projects included in companies' business plans to deliver the quality improvements supported by ministerial guidance. Not all of these are funded in full. When company proposals were not fully specified, or are dependent on the outcome of investigations, we have included in price limits the costs of investigation only. A few company proposals are very costly for the benefits to be delivered, and we have not at this stage included them. All of these schemes and the outcome of any investigations will be reappraised during 2005-10.

Enhanced service levels

We have included £0.6 billion for companies to improve some aspects of their service to customers. Most of this relates to sewer flooding. Further expenditure on sewer flooding is also included in the supply/demand balance and capital maintenance categories, so that in total we have assumed about £1.0 billion to address the problem of sewer flooding. This will enable companies to provide permanent solutions to the vast majority of current hydraulic problems they identified in their business plans and mitigation measures for the rest.

This would resolve 9,210 or about 90% of the known and emerging high risk internal flooding problems which companies proposed to deal with and 6,030 or 80% of external ones. It would do so at around 75% of the cost proposed by the water companies.

To help customers where proposed capital schemes may not be cost beneficial we have assumed that companies will install measures to protect properties from the effects of flooding. Together with the mitigation already proposed by some companies this means that the effects of sewer flooding will be reduced for 4,660 properties. Price limits therefore now include either a capital scheme or measures to reduce the risk or impact of flooding for all those currently known high-risk problems which the companies proposed to tackle by 2010.

This is a significant change from our draft determinations and reflects the concerns expressed in representations. In their responses to our draft determinations, many companies, customer representatives and other stakeholders said that too little had been allowed for sewer flooding which is a key customer priority. Government and parliamentary committees also considered that early progress on sewer flooding should be made. In light of these views we have changed our approach to sewer flooding as explained below and in more detail in chapter 13.

In our draft determinations, we allowed for schemes which cost below £120,000 per problem solved and provided for further work which proved to be cost beneficial to be taken into account at future price reviews. In our final determinations we have assumed that all proposed expenditure on schemes costing below £120,000 per problem is likely to be cost beneficial. In addition, a proportion of expenditure on schemes costing more than £120,000 is likely to be justified on cost-benefit grounds, and has therefore been built into price limits. We judge that 70% of expenditure on schemes costing between £120,000 and £250,000 per problem and 40% of expenditure on schemes costing more than £250,000 is likely to be cost beneficial. It is for the companies to take decisions about the individual schemes to complete.

We have used these assumptions to decide how much customers should be asked to finance to address sewer flooding at this stage, and we have forecast the numbers of problems which could be resolved.

In addition, our price limits allow for measures to deal with 3,700 cases of flooding caused by repeated blockages.

We have also allowed for improvements to water pressure, taste and odour or hardness of drinking water by a number of companies.

1.6 Involving customers

We have taken account of customers' views in our decisions about future water and sewerage charges. We have taken a number of steps to ensure that we are aware of customers' views in the price setting process. We have received direct correspondence from customers and other interested parties, and we have considered water companies' evidence of customers' priorities submitted in their business plans. WaterVoice has sent us comments throughout the process on behalf of customers. Independent research was also jointly commissioned with other industry stakeholders, which has informed both our decisions and Ministers' guidance on what improvements are required for drinking water quality and the environment. We have looked to companies to reflect their customers' priorities in their business plans and have checked for customer support where improved service levels are proposed. In arriving at our final decisions, we have had regard to the views expressed by customers in their representations.

WaterVoice

Each of the WaterVoice Committees submitted reports to us setting out their views on the companies' business plans and whether these reflected the views and needs of local customers. WaterVoice Committees have built up an understanding of these issues through contact with customers and regular public meetings with water companies to discuss price review issues. These reports have been particularly useful in helping us to assess the value of the proposals put forward by the companies to improve service levels.

The WaterVoice Committees and customers themselves have expressed concern about the prospect of increases to customers' bills at this price review. The WaterVoice Council considered the price increases sought by companies in their business plans to be neither acceptable nor affordable, and feared that more customers could find themselves in debt. In its public letter of 3 June 2004, the WaterVoice Council called on Ofwat and the Government "to act as a matter of priority in the final stages of the price review, to enable increases in bills by the water companies to be cut by at least one third on average". Our final determinations of price limits meet our statutory duties and, in the event, are a third lower than the price limits in the companies' business plans.

Each WaterVoice Committee has held meetings with the water companies and with us in the period since we announced our draft determinations. The Committees have also submitted written representations to us setting out their views on our draft determinations. Further detail on their representations is included in chapter 5 and in the company-specific pages in chapter 7.

Business customers

Our regular meetings with business customers provide them with an opportunity to put forward their views on what we should be seeking to achieve when setting price limits. Like

household customers they want bill increases to be as low as possible. They are particularly concerned that, operating in competitive markets, they will be unable to pass on to their customers any increases in the costs of water and sewerage services. In some markets, including overseas markets, passing on such increases would make them uncompetitive. High rates of increase in any single year would also be a cause for concern.

Business customers also asked us to ensure that the price increases they face only reflect increases in costs that are attributable to them.

Joint stakeholder market research

In preparation for this review we worked with eight other stakeholders (Department for Environment, Food and Rural Affairs, Welsh Assembly Government, DWI, Environment Agency, Water UK, WaterVoice, Wildlife & Countryside Link and English Nature) to commission two market research studies into customers' views. We have used this research in arriving at our final determinations. Chapter 8 sets out in more detail what the research told us about customers' views and priorities.

1.7 Risk and uncertainty

Inevitably, whenever we set price limits and outputs at a price review there are uncertainties about the costs companies will incur in delivering the outputs and their precise nature. We also recognise that there may be subsequent changes in the requirements placed on a company.

Price limits and outputs are a package. This package will include some outputs that turn out to be more costly than assumed and others that are less so. Where a company can deliver for less than we assume in price limits then it gains from this outperformance.

Our price setting methodology gives companies incentives to perform efficiently, accepting that there may be both favourable and unfavourable changes between price reviews. Our methodology must also offer assurance that the impact on companies where circumstances or requirements change will not be so large as to outweigh the incentives to continue to improve efficiency. Equally we need to provide assurances to customers that price limits are no higher than they need to be to meet the outputs the company has to deliver.

For the majority of outputs we can make reasonably confident central estimates of costs and we aim to make the price limits we set sustainable over a five-year period. However, if there are significant changes to specified outputs or if very significant events occur that are outside the control of an efficient company we have mechanisms to allow for changes to price limits (up and down). These mechanisms are known as interim determinations and substantial effect determinations respectively (see chapter 16 for details).

These mechanisms have worked well over the past 15 years and we will continue to use them. The mechanisms include the use of our change protocol (a procedure for dealing with changes in outputs between price reviews) published in MD197 'AMP4 change protocol'. The change protocol sets out the principles and outline procedures for water companies and the quality regulators to obtain confirmation of any changes to the improvement programmes assumed in price limits for the period 2005-10.

The five-year price review process ensures that water companies do not carry risks for more than five years. The resulting relatively low level of risk inherent in the water industry is reflected in the cost of capital and we do not include any general allowance for unforeseen costs.

As set out in chapter 15, we have tested the final price limits for 'financeability' ie are the companies able to continue to raise the finance in the capital markets necessary to undertake their investment programmes? This enables the water sector as a whole to continue to achieve good credit quality. We have not, however, allowed any further 'headroom' in financial projections to absorb possible unanticipated cost shocks or risks of not achieving efficiency assumptions. To do so would even further insulate companies and would suggest a rather lower cost of capital than the one underpinning these price limits. As noted above, the price limits, outputs and protective mechanisms in the regulatory framework are an overall package.

A few issues are too uncertain to be included in our price limits. However, we are creating 'notified items' so that if the issues do arise and have a material impact on a company's costs then they can be considered as a reason for resetting that company's price limits between reviews. Companies put forward many potential items in their business plans and representations. After assessing the companies' proposals we believe that notified items are needed for:

- a difference (up or down) in the expected uptake of optional meters;
- increased levels of bad debt or debt management costs arising from the companies' disadvantaged position, including their inability to disconnect household customers for non-payment of bills;
- increases in charges for abstraction and discharges to controlled waters;
- increases in costs arising from lane rental or the Traffic Management Act; and
- the impact of International Financial Reporting Standards on the taxation of infrastructure expenditure.

The last three are new notified items for this review. We included notified items for meter optants and the level of bad debt and debt management costs at the last price review. These are set out in more detail in chapter 16.

1.8 Infrastructure charges

At price reviews we set infrastructure charges for connection of domestic properties to water or sewerage services for the first time. The infrastructure charge is a contribution towards the costs of developing local networks to serve these new customers. Companies can levy an infrastructure charge as well as the direct costs of making connections.

We are setting infrastructure charges at £239 (in 2002-03 prices) for both the water and the sewerage services in 2005-06. This is the same limit in real terms as set at the 1994 and 1999 price reviews but increased by inflation. Charges for future years will rise in line with inflation.

2. Why are bills rising?

Table 6 sets out the change in customers' bills arising from our price limits and the elements of expenditure that are driving this change.

Table 6 What is driving the changes in bills?

Average household bill in 2004-05		**£249**
Less	(1) past efficiency savings and outperformance	**(3)**
	(2) scope for reduction through future efficiency improvements[1]	**(13)**
Plus	(3) maintaining base services	**18**
	of which (a) changes in revenue	(6)
	(b) changes in operating costs	10
	(c) changes in capital maintenance	7
	(d) changes in impact of taxation	5
	(e) financing[2]	2
	(4) maintaining security of supplies to all customers[3]	**11**
	(5) the impact of improvements in services[3]	**33**
	of which (a) drinking water quality	9
	(b) environmental improvements	21
	(c) service performance	3
Average household bill in 2009-10		**£295**
Change from 2004-05 to 2009-10		**£46**

1 This is the effect of our future efficiency assumptions for all the cost elements; ie base service, maintaining security of supply and improvements in services.
2 This is the impact of the change in the cost of financing the base service.
3 These lines show the impact of improvements in services. Where companies need additional revenue for financeability (net of taxation included in line 3(d)) it is allocated in this table across these improvements because it is this new investment which puts the extra pressure on companies' financial position.

Overall our price limits will lead to a £46 real terms increase in the average household bill for the industry, to which the effects of inflation over five years (currently expected to be around 2.5% per year) will be added.

The extent to which overall bills will increase following this review depends on a number of factors – not least of which is efficiency. In an incentive-based regime, the impact of past and future efficiencies assumed is a key element. Past and future efficiency improvements will lead to a reduction in average bills of £16 by 2009-10. However, day-to-day running costs and the costs of maintaining the water and sewerage system will increase by around £18. Maintaining the security of supply to customers will add a further £11 to bills.

New outputs, over and above items funded as part of base costs, have to be paid for and it is these items that contribute most to increases in customers' bills. Where companies are financially stretched, it costs even more to produce these new outputs because the marginal cost of finance will be greater. New capital investment requires additional finance either from shareholders or new borrowing in addition to that already undertaken by the companies to finance the existing programme.

At the 1999 price review past outperformance and future expected efficiency placed a downward pressure on bills that offset the upward pressure on bills of service, environmental and quality improvements. The situation is very different at this price review.

Companies have invested heavily to improve their drinking water quality and their environmental performance and as a consequence have had to finance this investment. Expenditure, including the cost of servicing the cost of finance for capital investment, exceeds revenue. In these circumstances it costs even more for companies to finance new outputs. The further improvements now required, in aggregate, will add £33 before efficiency factors to the average household bill by 2009-10.

We describe each of the factors that contribute to the change in bills and the approach we have taken to them in arriving at our price limits.

2.1 Efficiency savings and outperformance

Past efficiency savings and outperformance

The water companies have achieved a great deal over the last 15 years. The quality of the services they deliver to their customers is at an all-time high. The pollution impact of the industry on the environment reduces every year. Improving levels of efficiency mean that more has been delivered for less. The industry has embraced new technology, and new approaches to management and service delivery to customers. Our joint drive with the industry for better quality data both for management and regulation has also helped.

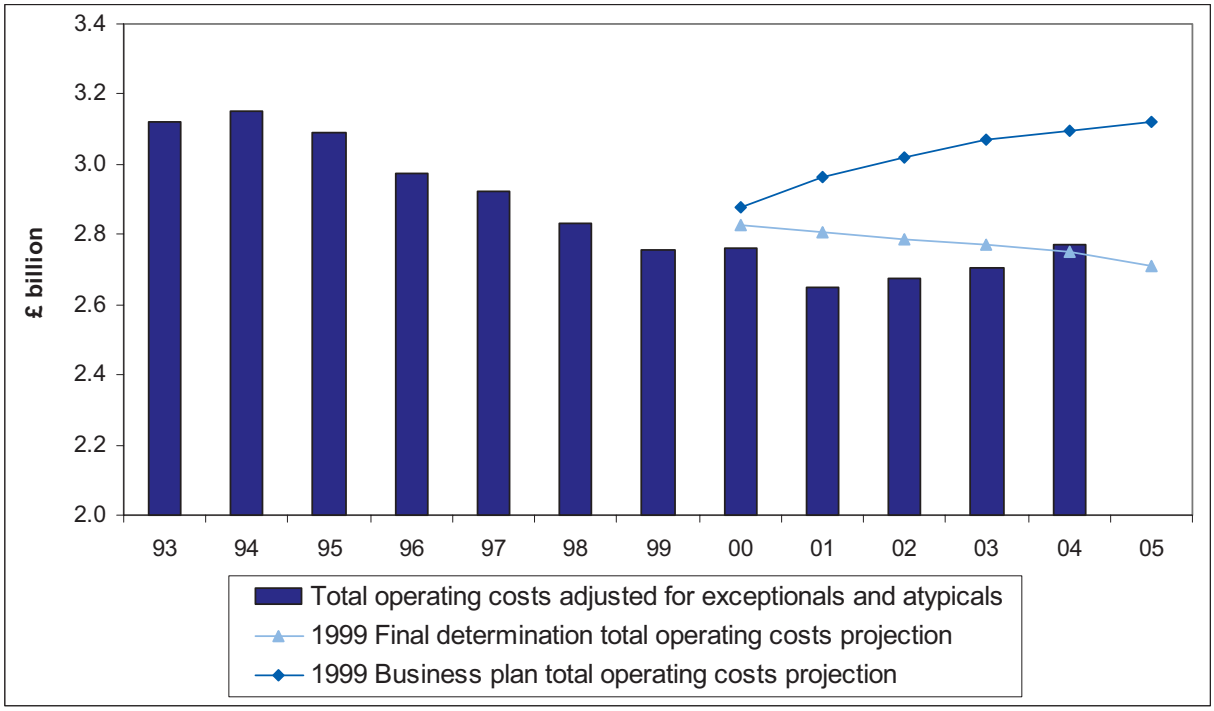
Each time price limits have been set we have included challenging efficiency assumptions, over and above the improvements achieved in the economy as a whole. Each time the industry has performed better than we assumed. Customers benefit from real improvements in efficiency, through bills being lower than would otherwise have been the case. To stimulate each company to improve further, we have established a series of rolling incentive mechanisms. These guarantee that a company will retain, for at least five years, the financial benefits of outperforming the efficiency improvements assumed in price limits.

The industry has continued to outperform during the current five-year period, although to a lesser extent than previously. The degree of outperformance varies between operating and capital expenditure and between the water and sewerage services. The latest position is summarised in our ‘Financial performance and expenditure of the water companies in England and Wales – 2003-2004 report‘ (September 2004).

There is an interaction between the rate at which efficiency improves and cost shocks that can occur from time-to-time. Within our regulatory framework, we deal with the risks of cost shocks through our judgements on the appropriate cost of capital.

These links are best demonstrated by looking at the trends in operating expenditure since 1993, as set out in figure 1. The outperformance of our assumptions in 2001 has been eroded by increases in costs since 2002-03 – for the most part these have arisen from cost increases associated with increased National Insurance contributions, pension contributions and energy bills.

Figure 1 Water and sewerage industry – operating costs 1993-2005



Future efficiency improvements

We recognise the past successes of the companies, but do not accept the view of some of them that there is little or no scope for further efficiency improvements relative to the economy as a whole. Our analysis of the relative efficiency of the companies highlights that there is still considerable variation in performance, with companies improving at different rates. Stimulating those companies that are not the most efficient to catch up with the current performance of the best companies will deliver further real efficiency improvements by the industry. Additionally, work by our consultants (and others) as well as the considered judgements of some of the leading companies all support our view that there is still scope for the best performing companies to improve.

We have sought an evidence-based approach to the assessment of the overall scope for further efficiency improvements. Many reports have been commissioned on the subject, with no consensus emerging. We have thoroughly examined all of the arguments and assessments made by the water companies. We have updated and refined our analysis of the relative efficiency of each company for operations, capital maintenance and capital works. We have used the latest information from companies and have looked closely at assessments made by the leading water companies.

Our work and preliminary views have been subject to scrutiny by our consultants. We have considered carefully the position for both water and sewerage and each area of expenditure. We have tested our potential benchmarks, and are reassured that there are large companies at or near the benchmark for both the operating and capital maintenance efficiency rankings.

We have changed our assessment of the scope for operating efficiency since our draft determinations. We have taken account of the data provided in the 2004 June returns, and have considered the companies' representations, particularly those factors in a company's operating environment that are not reflected in our econometric cost models. We have also looked carefully at our benchmark companies to check whether their performance is unduly

influenced by special factors. This has resulted in a change for the sewerage service. In the light of representations, we have concluded that Thames' performance is still unduly affected by large London works that make it unreasonable to use them as the benchmark for operating performance. This change has made a material difference to the scope for operating catch-up improvements for the sewerage service.

We try to find an appropriate balance between incentives and the efficiency assumptions included in price limits. If we were to include the whole of the scope for improvements in price limits, companies would not have any incentive to outperform.

We have applied our published policy on the sharing of the overall scope for efficiency, by including only part of it in price limits (the 'stick') with the remainder being potential future outperformance (the 'carrot'). The common continuing efficiency factors and the ranges of catch-up efficiency factors we have used are set out in table 7. Overall, we have assumed only around half of the scope for efficiency savings in our price limits, the remaining half being potential outperformance for companies.

Table 7 illustrates the balance of carrots and sticks. For example, for water base operating costs we assess the overall scope for efficiency improvements as 2.4% a year. This is split into 0.6% a year continuing improvement and 1.8% for the catch-up. We have included only half of the scope for continuing efficiency in price limits (0.3%) and over half of the scope for catch-up (1.1%). The balance represents the potential for outperformance for the companies.

Our assessment of the overall scope for efficiency is a continuing annual efficiency of around 0.6% and 1.0% for operating expenditure and capital maintenance respectively in the water service. For the sewerage service the equivalent figures are 1% and 1.2%. Taken together with the potential for companies to catch up, this would imply a scope for efficiency over the five years of around 2.4% a year for operating expenditure and around 3.6% for capital maintenance. In line with our policy on carrots and sticks we have included just over half of these assumptions in price limits. The corresponding scope for efficiency assumed at the last price review was over 3.7% a year for operating costs and about 5.6% for capital maintenance.

Further details on our approach to efficiency are set out in chapter 10.

Table 7 Improving efficiency – the 'carrot and stick' model

Operating expenditure – annual average rate of improvement	Efficiency improvement factors assumed in our final determinations			Potential outperformance incentive			Likely overall scope
	'Sticks'			'Carrots'			
	Catch-up improvement factor	Continuing improvement factor	**Total 'stick' improvement factor**	Catch-up out-performance	Continuing out-performance	**Total out-performance 'carrot'**	
Water service – base	1.1%	0.3%	**1.4%**	0.7%	0.3%	**1.0%**	**2.4%**
Water service – enhancements	1.4%	0.45%	**1.85%**	0.4%	0.45%	**0.85%**	**2.7%**
Sewerage service – base	0.8%	0.5%	**1.3%**	0.5%	0.5%	**1.0%**	**2.3%**
Sewerage service – enhancements	1.0%	0.75%	**1.75%**	0.3%	0.75%	**1.05%**	**2.8%**

Capital expenditure – cumulative improvement over the period 2005-10	Efficiency improvement factors assumed in our final determinations			Potential outperformance incentive			Likely overall scope
	'Sticks'			'Carrots'			
	Catch-up improvement factor	Continuing improvement factor	**Total 'stick' improvement factor**	Catch-up out-performance	Continuing out-performance	**Total out-performance 'carrot'**	
Water service – capital maintenance	5.4%	2.5%	**7.9%**	6.6%	2.5%	**9.1%**	**17.0%**
Water service – capital enhancements	8.2%	3.7%	**11.9%**	2.6%	3.7%	**6.3%**	**18.2%**
Sewerage service – capital maintenance	6.2%	3.0%	**9.2%**	6.6%	3.0%	**9.6%**	**18.8%**
Sewerage service – capital enhancements	8.5%	4.4%	**12.9%**	2.7%	4.4%	**7.1%**	**20.0%**

The greater efficiency of the companies has enabled customers' bills to be markedly lower than they would otherwise have been. We estimate that overall efficiency improvements since privatisation to 2004-05 have reduced bills by around £90. Our price limits allow bills to reduce by a further £16 to reflect both past outperformance since the last review and future efficiency improvements to be achieved by the companies by 2009-10.

Stimulating future outperformance

On average companies are currently outperforming our assumptions for the period 2000-04 by about 1% a year for capital maintenance, which is about half the estimated carrot for this period. The outperformance recorded so far for the capital enhancement programme is noticeably higher in the sewerage service; 2.1% a year for water enhancement projects and 4.7% a year for sewerage enhancement projects. This suggests that there is a higher scope for efficiency in this area.

Although they do not directly influence the changes in bills in the period under review, the improved incentive mechanisms we have put in place should stimulate individual companies to strive to outperform our assumptions. We set out our proposals on the enhanced mechanisms in MD187, 'PR04 – A further consultation on incentive mechanisms' (June 2003) and published our decisions in MD191, 'Our conclusions on rewarding outperformance and handling underperformance' (March 2004). These mechanisms will provide additional rewards for future outperformance by the current leading companies.

Our latest relative efficiency analysis has identified 12 companies that would meet our criteria on operating expenditure outperformance or capital expenditure (and in three cases both).

These companies would qualify for the enhanced rewards for future outperformance. This is set out in section 10.9 of chapter 10.

Customers will start to see the benefits of future outperformance in their bills from 2010, following the price review in 2009. In the meantime the rewards of outperforming our expectations will stay with the individual company through higher returns and profitability. As we set out in MD187, even with the enhanced rolling incentive mechanisms customers gain most from these arrangements over the long term.

2.2 Revenue

At a price review, our assumptions about future revenues take account of what has actually happened to each company's customer base over the past five years. The starting point for our assumptions is the companies' current revenue base, which incorporates the number of customers they currently supply and the level of income they receive from them. Companies are now receiving more revenue than we forecast when we set price limits in 1999, and this allows for bills to be adjusted downwards.

At an industry level, companies have collected slightly more revenue than we assumed in the price limits set in 1999. This resulted from a combination of:

- higher demand than forecast for drinking water and disposal of sewage from existing domestic and business customers;
- a larger number of new customers connecting to the water and sewerage networks than expected; and
- a lower uptake of optional metering, which tends to reduce revenues, than forecast in 1999.

There is also some scope to reduce the increase in price limits because of the way in which we profiled price limits in 1999. Our assumptions matched costs and revenues over the entire 2000-05 period, but not precisely in each individual year. We assumed slightly higher revenues towards the end of the period 2000-05. This factor allows for a small downward adjustment at the start of the following five-year period.

Companies forecast little change in their revenue to 2010. Most companies expect that housing growth will increase their customer base, and therefore their revenues. But this is largely offset by the effects of increased numbers of metered customers and declining industrial demand in depressing revenues. Metering tends to reduce revenues because, on average, it is customers with above average rateable values and with relatively low demand who have taken up optional meters as a way of reducing their annual bills. Further details on our assumptions on companies' revenues are set out in chapter 14.

Overall these factors lead to a reduction in the average household bill, at the industry level, of £6 by 2009-10.

2.3 Operating costs

Companies have set out the need for significant increases to their base operating expenditure in the 2005-10 period in their business plans. We have allowed for some of these costs in price limits.

We have taken account of pension costs, but not the full increases that companies proposed. Some companies considered that a proportion of the existing pension scheme deficits would be recovered over time. The allowances we assume in price limits include recovery of half of any past deficit and all future employers' contributions. This approach requires the companies to shoulder part of the risk in this area as they would if they were not regulated monopolies.

We accept that energy costs will rise disproportionately for the water companies which are high users of power, particularly electricity. However, the rise in energy costs will also be reflected in general inflation, and we have factored this into the change in energy costs included in the price limits. We expect energy costs to rise by 40% in the next two years. However, because we expect this to lead to an increase in inflation of around 0.5% a year we have reduced the increase in companies' price limits accordingly.

Companies' business plans included significant rises in the costs of bad debt and debt management. Responses from companies and stakeholders to our draft determinations reiterated their concerns that bad debt will increase further during 2005-10. We consider that companies should pursue customer debts efficiently and have not adjusted their future operating costs. However, we will continue to keep the cost of bad debts and debt management as a notified item for an interim determination. We have amended the wording of the notified item to soften the link to the loss of disconnections following the Water Industry Act 1999. Chapter 16 on uncertainties covers this.

From 2005, the Government will reassess the charges for non-domestic rates for parts of the companies' business. Estimates of these are available and we have included these in price limits.

Companies also argued for increases in costs arising from the new Landfill Tax and the potential changes to the system of charging for water abstraction. We consider that efficient companies will be able to absorb or mitigate the impact of the Landfill Tax.

We have not made an allowance for Environment Agency charges rising faster than inflation because there is considerable uncertainty about the probability and scale of the increases. However, we have put a notified item in place to protect companies that face material increases in Environment Agency charges.

Overall, the assumed changes in operating costs at an industry level will increase average household bills by £10 by 2009-10 before applying our efficiency assumptions. Further details on our approach are set out in chapter 11.

2.4 Capital maintenance

Most companies anticipate spending more on maintaining their existing assets in future. We generally accept that a higher level of maintenance is required to maintain services to customers.

Since privatisation, around £50 billion has been invested in new assets and in the maintenance of existing assets. This has funded drinking water quality and environmental improvements. The improvements made have a higher proportion of shorter life assets than in the past, for example IT and telemetry systems. These assets have to be replaced more often and many of the short and medium life assets installed during the 1990s will need to be replaced or modernised by 2010. Capital maintenance will have to increase to retain the substantial improvements brought about by the quality improvement programmes.

However, companies should invest at the right level and at the right time. Our assessments challenge the level of capital maintenance expenditure the companies set out in their business plans to maintain or achieve stable serviceability, now and in the future. We have carefully assessed the quality of companies' proposals for the future. Where a company clearly understands the risk profile of its assets and is able to assess accurately the investment it needs to maintain serviceability, then we have accepted this element of the plan.

Our assumptions on the level of capital maintenance will allow companies to deal with new sewer flooding incidents and some additional mitigation of nuisance, including odour from sewage treatment works.

Expenditure on capital maintenance is not directly reflected in price limits, or customers' bills, in the year in which it is spent. Instead, the expenditure is spread over the useful life of the assets through capital charges. It is the capital charge for maintenance that directly changes customers' bills. Capital maintenance expenditure for above ground assets (such as treatment works) and underground assets (such as sewers and pipes) contributes to the capital charges in customers' bills in different ways.

- Capital maintenance expenditure on above ground assets is paid for in bills over the life of the investment through depreciation charges (on a current cost basis).

- Capital maintenance expenditure on the underground network (sewers and pipes) is averaged over a 15-year period (2000-15). It is this average, the infrastructure renewals charge, which is paid through customers' bills. This approach means that, where we assume increasing levels of capital maintenance on the underground networks for 2010-15, ie beyond the current review period, then the infrastructure renewals charge assumed in price limits for 2005-10 will be higher.

Overall, the increase in average household bills expected from the higher levels of capital maintenance investment (and hence higher capital charges allowed in price limits) is around £7 (before applying our efficiency assumptions).

2.5 Maintaining security of supply

Maintaining the balance between supply and demand

Maintaining a balance between supply and demand for water and sewerage services is implicit in companies' statutory duties. They have duties to meet demand for their services and to connect new premises to their networks, whilst ensuring no deterioration in environmental compliance. Companies must invest to comply with these requirements. Water companies plan the development of water resources on a long-term basis to ensure the continued security of public water supplies. They extend their networks in areas of housing growth.

The rate of investment in the supply/demand balance across England and Wales is around 60% higher than that allowed in the 1999 determination. While demand for water is not rising sharply at the industry level, there are significant changes in the distribution of demand. This is particularly so in areas of housing growth in the south and east of England. Similarly, the companies extend and increase the capacity of their sewage treatment works and sewerage assets as sewage flows grow, for example due to increased property connections and dealing with run-off from more paved surfaces.

Most of this investment should be offset by receipts from developers through infrastructure charges and contributions. But despite additional revenues from new connections, the additional costs of new assets place an upward pressure on bills.

We have examined companies' plans carefully to ensure that the work proposed is clearly set out and required as part of an efficient long-term strategy to maintain the balance between supply and demand. We have also carefully scrutinised costs and checked to ensure consistency with forecasts of demand and revenues.

For the sewerage service, we have closely assessed the sewerage and sewage treatment improvements proposed by companies and the associated costs.

Enhanced security of supply

We have allowed for significant improvements to the security of public water supply where warranted. The most significant of these is in London. Our determination allows for a substantial programme of both mains renewal to reduce leakage and water resource enhancements to improve the security of supply sought by Thames.

Metering

Companies are required to meet household customers' demands for free meters. Metering has an immediate capital cost made up of the cost of the meter and its installation, and the ongoing costs of meter reading and maintenance, which must be reflected in price limits. In addition, a number of companies have proposed selective metering programmes, usually on change of occupancy, to accelerate meter penetration and improve demand management. We have accepted most companies' forecasts in these areas as part of a balanced approach to the management of water resources. By 2009-10, we expect around 36% of household customers to have metered supplies compared with 24% in 2003-04.

Impact on customers' bills

In aggregate, expenditure on metering, enhancing security of supply and maintaining the balance between supply and demand for water and sewerage services is expected to add £11 to the average household bill by 2009-10, before applying our efficiency assumptions.

Further details on our overall approach to maintaining the security of supplies to customers and the supply/demand balance is set out in chapter 12.

2.6 The quality improvement programme

Ministers set out in their principal guidance in March 2004 the policies and programmes for improvements to drinking water and the environment that the companies are required to deliver in 2005-10. The DWI and the Environment Agency worked with the companies to translate these requirements into a list of schemes for inclusion in the companies' final business plans. Since our draft determinations, in August, the companies and quality regulators have provided more supporting information to allow projects we excluded from our draft determinations to be included in price limits. Ministers have also published their final guidance, which was informed by our draft determinations, new information and developments in policy.

We have scrutinised all proposals where new information is available and included only those projects in price limits that meet our five criteria:

- It is required by the quality regulators, and confirmed by Ministers, or is a new obligation under current legislation.
- It delivers a measurable defined output, which is enforceable.
- It has a clearly defined timetable and due date for delivery in line with regulations or other legislation.
- There are defined asset improvements or changes to operational procedures to deliver the output.
- It has identified costs – the solution must have been challenged and validated by the company's reporter.

Where we have excluded projects, the change protocol can be used to take account of those projects that go ahead within the period 2005-10.

Table 8 summarises the numbers and costs of the projects that we have included in our price limits. A number of projects in companies' final business plans were excluded from our draft determinations, as the proposals were insufficiently defined or costed. Some of these are included in our final determinations, where new information has satisfied our criteria. Some projects that were in our draft determinations are not included in our final determinations; for example projects that are no longer supported by the quality regulators, usually where the investigations have shown that they are not needed in the next five years. Final ministerial guidance also indicated that the costs associated with reductions in abstraction licences should not be included directly in price limits, but should be funded through the compensation route laid down in the Water Resources Act 1991. We consider that some projects, put forward by companies as part of the quality programme, are more appropriately dealt with in other areas, such as capital maintenance. Equally, we have treated some work proposed by companies elsewhere in their business plans as part of the quality programme.

Table 8 The quality improvement programme for 2005-10

	Companies' business plans		Draft determinations		Final determinations	
	No. of projects	Capital expenditure £ million	No. of projects	Capital expenditure £ million	No. of projects	Capital expenditure £ million
Water service						
Drinking water and other obligations	357	2,200	327	1,877	348[1]	2,014
Environmental investigations and solutions with ministerial support	218	136	181	60	183	47
Water service total	575	2,336	508	1,937	531	2,061
Sewerage service						
Environment Agency environment programme for 2005-10 with ministerial support and other new obligations	2,967	3,974	2,660	2,435	2,731	2,631
Completion of 2000-05 programme	668	542	689	708	658	819
Sewerage service total	3,635[2]	4,516	3,349[2]	3,143	3,389	3,450
Total	**4,210[2]**	**6,852**	**3,857[2]**	**5,080**	**3,920**	**5,512**

1 Includes further projects submitted by companies since our draft determinations.
2 196 projects included in our draft determination have been excluded as they do not have any costs or outputs in 2005-10.

In response to comments on our draft determinations we have changed the format for this table. For the sewerage service, other new obligations for 2005-10 and the environmental programme for 2005-10, supported by Ministers, are added together. This is consistent with tables 33 and 38 in chapter 13.

Drinking water quality and other new obligations

In their business plans companies included £2.2 billion expenditure for improvements to drinking water quality and other new obligations affecting the supply of a safe, secure supply of drinking water. This included improvements to 230 water treatment works and 13,475 km of distribution mains and for cleaning another 35,600 km of mains.

We examined companies' plans and assessed whether their proposals met our criteria for inclusion in price limits. The majority did so. The costs of companies' proposals to continue to supply high-quality drinking water varied across companies. One small company required no further expenditure while, at the other end of the scale, another company stated it needed to invest £350 million. Most of this work is driven by the introduction of new standards, or the interpretation and enforcement of existing standards. Some companies also need to install new equipment to deal with the pollution of some of their water sources that supply drinking water, notably by nitrates from agriculture.

We reviewed companies' proposals against our criteria; 12 projects (with an estimated gross cost of £115 million) still do not meet our criteria. Also we considered seven projects affecting

water quality as part of capital maintenance expenditure (£22 million) rather than as a quality improvement.

Final ministerial guidance supported the programme of work to improve consumer acceptability of drinking water. We reviewed our approach to the funding of proposals for cleaning the distribution system, and have incorporated some of them in the quality improvement programme. The projects incorporated include those with defined outputs associated with completion of the 1989 programme of work to renovate the distribution system. We also consider that work on cleaning and relining large diameter trunk mains for consumer acceptability is more suitable for monitoring within the quality enhancement programme. We have considered the rest of the work on cleaning the distribution mains alongside the companies' proposals for maintaining the water distribution network.

Overall, our determinations assume that the programme of work required to improve drinking water quality and comply with other new obligations will be delivered for capital expenditure of £2.0 billion, with associated net additional operating costs of £29 million per year by 2009-10.

Of this work, £230 million for 62 schemes has already been confirmed so that companies can make an early start. This allowed companies to plan their programmes ahead of final determinations and mitigates the inefficient 'rollercoaster' pattern of investment seen in previous pricing periods.

Environmental obligations affecting the water service

The environmental regulators, particularly English Nature and the Countryside Council for Wales, are concerned that water abstraction for the public water supply is affecting some important nature conservation sites. These are sites of special scientific interest (SSSIs) or sites of European importance, which are affected either by depleted groundwater or low flows in water courses.

The companies included 218 projects in their final business plans. These were projects to continue with their investigations on the potential impact of their activity, and also (where appropriate) proposals to alleviate identified problems. We have examined each company's proposals alongside the work programmes defined by the Environment Agency. Much of this work is still at the investigation stage.

We have included 167 investigations/options appraisals in these price limits. Some of these are very extensive, and where appropriate we have only allowed the first stage. This will allow a thorough reappraisal of the way forward where initial research has indicated there is scope for further work. We have included 16 projects to alleviate some of the environmental impact of water abstraction, such as fish passes and protection screens at water abstraction intakes.

Final ministerial guidance set out the legal developments in this area. Projects to provide replacement water where abstraction licences need to be reduced to alleviate the environmental impact of water abstraction have not been included in our final price limits. We understand that the projects identified so far will remain on the Environment Agency's list of work that is needed. These will be dealt with under the compensation route laid down in the Water Resources Act 1991. Companies will need to carry out the work, but will be compensated for this by the Environment Agency. The costs will be recovered from the abstraction charges levied on all abstractors, not just the water companies.

Overall, our determinations assume that the programme of work required to investigate and carry out confirmed work or options appraisals on the environmental impact of water

abstraction will be delivered for capital expenditure of £47 million, with associated net additional operating costs of £2.4 million per year by 2009-10.

Sewerage service environmental obligations and other new obligations

Companies included proposals for 3,635 projects in their final business plans for quality improvements to the sewerage service. Companies adopted an integrated approach; for example, work at sewage treatment works is often planned to deal with more than one obligation. These proposals dealt with around 4,200 different quality obligations as well as providing maintenance and supply/demand benefits. These projects include a number of investigations proposed by the Environment Agency, English Nature and the Countryside Council for Wales for companies to assess the impact of their activities on the environment and to appraise any options for addressing them.

The majority of this work was proposed to meet the expectations set out in Ministers' guidance. Companies also need to carry out other quality enhancements, such as work planned for 2000-05, that continues into 2005-10 including work where delays have been experienced. We have ensured that companies have not benefited financially from any delays and that only the reasonable costs of completing these schemes are included in our determinations.

Having reviewed the scope of the work, we scrutinised and challenged the companies' proposals. Overall we have included capital expenditure of more than £3.4 billion in our price limits for quality improvements for the sewerage service. This includes £113 million capital expenditure for 235 projects confirmed at the end of 2003, including 20 projects for supply demand balance as the early start initiative for environmental improvements. A few projects included in the early start programme did not receive support in final ministerial guidance and companies have agreed to them not being included in final price limits.

Regulatory impact assessment

The principal ministerial guidance in England issued in March 2004 required Defra to carry out a regulatory impact assessment on projects in five policy areas that were not required by national or European legislation. Final ministerial guidance confirmed that certain projects in these policy areas should proceed.

We have assessed the projects proposed against our criteria and the majority are included in price limits. Details are given in chapter 13.

Further improvements

We have only included projects in our price limits that meet our criteria. However, the excluded projects can be added to the improvement programme during the 2005-10 period using the change protocol. There is also potential for the need for new projects to arise during 2005-10. These could arise, for example, from the Habitats, Urban Waste Water Treatment, Bathing Water or Water Framework Directives. Any of these might require increased capital investment. Although there is considerable uncertainty, a plausible upper limit on all these obligations could require the industry to invest a further £1.5 billion in the 2005-10 period. This is on top of the £5.5 billion included in price limits for quality and environmental improvements. We are aware that for United Utilities some environmental obligations are likely to be confirmed for the early part of 2005-10. These are not yet sufficiently defined to include in price limits, but could lead to a significant upward pressure on bills.

Overall impact of the quality improvements programme on customers' bills

Overall, our determinations imply that a rise of £30 in the average household bill by 2009-10 is needed to pay for the quality improvement programme – £9 for drinking water quality and £21 for improvements to the environment. These figures are before applying our efficiency assumptions to new investment to improve drinking water quality and the environment. The figure is £27 once efficiencies have been applied. Further details on the quality improvement programme are set out in chapter 13.

2.7 Other service improvements

Since 1991, the industry's performance has steadily improved across the range of service level indicators we monitor. Performance is now stabilising at levels that represent a good level of service to the majority of customers. This is demonstrated by the joint stakeholder research and reflected in our overall performance assessment (OPA) scores. Against this background very few companies included proposals to improve service levels in areas other than sewer flooding. Some proposals were included to address specific, localised problems with low water pressure and the taste, odour and hardness of drinking water.

We have scrutinised companies' proposals against a number of criteria, including customer need and willingness to pay higher bills for the proposed improvements. We also expect schemes to deliver a clear improvement in levels of service to customers in a cost-effective way.

At an industry level our determinations include a total of £0.6 billion for enhanced service levels, which will deal with low flow and water pressure; improve the taste and odour of the drinking water; reduce the hardness of drinking water; and solve known and newly emerging problems of internal and external sewer flooding. Further expenditure on sewer flooding of £0.4 billion is included as part of the supply/demand balance and capital maintenance.

These service improvements would add approximately £3 to bills by 2009-10 (before applying efficiency assumptions). Further details are set out in chapter 13.

Linking service to prices

The OPA measures companies' performance across all service areas. It provides an incentive to companies not just to be efficient, but to deliver first class service to customers. At price reviews we take account of comparative company performance, as measured by the OPA. We allow companies with the best performance to charge their customers slightly more and those with comparatively worse performance slightly less. At this price review we have applied adjustments to price limits ranging from +0.4% to -0.1% in the first year of price limits. This is set out in table 25 in chapter 10.

2.8 Financial issues

Cost of capital and financeability

Efficient companies must be able to finance their functions. A company which is efficiently managed and financed should be able to earn a return at least equal to the cost of capital, and its revenues, profits and cashflows should allow it to raise finance on reasonable terms in the capital markets. We refer to this second element as financeability. The continuing large capital programme places a financing strain on the companies and has made our approach to financeability and the cost of capital a critical issue at this review.

The cost of capital is a significant element within the determination of price limits because it is applied to the entire capital base of each company, not just new investment. If the cost of capital is set too low then companies may experience difficulties in financing their mandatory investment programmes. If it is set too high, shareholders may earn windfall returns.

Assessing the cost of capital is not a mechanical process, in part because it concerns market perceptions about the future. Much of the evidence about the cost of capital since the last review has been difficult to interpret because of the considerable volatility in the capital markets over that period. These uncertainties mean that we cannot place too much weight on one tool for assessing the cost of capital, such as the capital asset pricing model, as was the case at previous reviews. We have therefore assessed a wide range of evidence including that from other models (such as the dividend growth model), direct market data, valuations from corporate transactions, and from talking to investors.

At an early stage in the review, we indicated to companies that the evidence pointed to a basic cost of capital no lower than 5.0% post-tax in real terms, compared with 4.75% used at the last review. This recognised that the companies have enjoyed a period of historically low interest rates since the last review but also took into account indications that this will not persist. There is also evidence to suggest that the return required by equity investors may have risen since the last review in 1999.

Water and sewerage companies in their final business plans argued for a post-tax cost of capital ranging from 5.0% to 5.5% in real terms. The range for the water only companies is wider at 5.7% to 6.5%.

We believe that our approach to setting price limits should create conditions under which the additional investment required could come from debt or equity sources. We believe that the returns allowed should provide shareholders with sufficient incentives to commit additional funds, either in the form of retained earnings or new equity injections where this is appropriate, to enable companies to make new investment. Efficient companies should be able to retain stable credit quality going forward.

Taking all this into account we have assumed a cost of capital of 5.1% post-tax in real terms in our determinations. This is equivalent to 7.3% on a fully pre-tax basis (assuming a 30% marginal tax rate). We have also allowed for a small company premium for the water only companies. This ranges from 0.3% to 0.9% depending on the size of the company.

A consequence of requiring companies to undertake large capital programmes is persistent negative cashflow, ie companies spend more than they receive. This can lead to a deterioration in credit quality which could restrict companies' access to capital markets or significantly increase the cost of finance. Consequently, we have tested the financial projections underpinning the price limits against our financeability criteria. In our assumptions reflected in the price limits, we believe that we have reached an outcome that balances the position for customers, without jeopardising efficient companies' ability to access capital markets and to finance their functions.

The constraints of the capital programme impact in the later years of the period, as may be expected given that its effect is cumulative. In aggregate, price limits include around 1.0% for 2007-08 rising to 1.3% by 2009-10 to maintain financeability.

This approach coupled with any outperformance of our assumptions could give rise to higher returns in the later years of the period. Given the potential capital programme beyond 2010, we would expect prudent companies to retain an appropriate proportion of earnings to alleviate the financial strain. If this is not the case, then the argument that large capital programmes increase financial strain could not be sustained at future reviews.

The regulatory capital value

When we assess the return that a company needs to finance its functions, we need to consider the capital base as well as the cost of capital. We have continued to use the well understood concept of the regulatory capital value (RCV) as the measure of the capital base.

Our price limits assume that the industry aggregate RCV will grow from just under £35 billion at March 2005 to almost £41 billion by March 2010.

Impact on customers' bills

The impact of changes to the regulatory capital value, the cost of capital and any additional impact of financeability directly affects the cost to customers of existing as well as new investment.

To maintain base services, the net impact of our decisions in these areas is expected to add around £2 to the average household bill by 2009-10.

As noted in section 2.6, the cost of improvements to drinking water quality and the environment will increase average household bills by 2009-10. The cost of capital and financeability are a large component of this increase.

2.9 Taxation

Water companies, like other industries, need to pay business taxes. Our price limits therefore include an assumption about the level of tax which the companies will have to pay. The corporation tax positions of the companies vary, but the impact of companies' tax payments could be significant for the price limits of some companies.

Up to 1995, the effective current tax rate, ie the proportion which the tax charges bear to profits, was low – averaging less than 2% across the industry. This is now rising and, in the price limits, effective current tax rates rise to around 26% by 2009-10 on average across the industry.

One of the reasons for this is that a special agreement with the Inland Revenue comes to an end in April 2005. The way that the Inland Revenue will treat certain types of expenditure for tax purposes will change so that the treatment of water companies is brought into line with other sectors of the economy. This will lead to higher levels of business taxes on water companies, and places an upward pressure on bills.

For some companies, the increases in tax may be mitigated. Our approach assumes that price limits include a forecast of the companies' expected tax liabilities and not a notional tax liability linked to our assumptions on capital structures. For some companies with high levels of gearing, this means that their tax bills may be lower than experienced in 2000-05 despite the ending of the special agreement with the Inland Revenue.

Across the industry as a whole, the change in taxation is expected to add £5 to the average household bill by 2009-10.

3. The longer term context – beyond 2010

When implemented, the Water Act 2003 will oblige the new Water Services Regulation Authority (WSRA) to carry out its duties in the manner which it considers is best calculated, amongst other things, to contribute to the achievement of sustainable development. (The WSRA will replace the role of the Director General of Water Services.) This obligation is not yet in force. However, we believe that the concepts underlying sustainable development are consistent with our current statutory duties, and that the price limits will contribute in a balanced way to achieving the following four objectives: social progress; effective environment protection; prudent use of natural resources; and maintenance of high and stable levels of economic growth.

The long term

Our starting point is that achieving sustainable development requires a long-term perspective: meeting the needs of the present without compromising the ability of future generations to meet their own needs. We set out in 1992, before our first price review, "the objective of ensuring the effective, and financially viable, long-term provision of appropriate quality services to customers and the community" (Ofwat's strategic business plan manual). This remains so. Although at a price review we inevitably concentrate on the next five years we set this within an evolving longer term perspective. We asked companies to set out proposals that extend to 2014-15, with longer term projections for asset maintenance requirements, and water resource plans that cover a 25-year period.

Climate change

The water industry and its regulators need to take account of the many uncertainties when looking to the long term. A major issue is the rate of climate change and its likely impact on all aspects of the provision of water and sewerage services and the environment. It is neither possible nor sensible to set out detailed requirements to cater for these eventualities now. But the coherent framework of regulatory and asset planning systems can identify, and allow the companies to address the impact of, climate change as it becomes evident. In general, companies' plans did not seek significant precautionary investment, but confirmed climate change as a growing future issue and gave some indications of possible implications for both the water supply and the sewerage networks. Gaining greater certainty in these areas is a priority for the next few years so that appropriate integrated strategies can be incorporated into future price reviews. We believe that the action proposed for the period 2005-10 will prepare the industry to deal with changes within the range of possibilities forecast without undertaking inappropriate and unnecessary investment. We will take account of the latest and best evidence as it develops.

The remainder of this section links the objectives of sustainable development to the outcomes described in this report.

Social progress

Since privatisation, customers have benefited from major improvements in the quality and continuity of supply of drinking water, as well as higher levels of customer service. Price increases are never welcome. But for most customers the average increase in water bills, of around 7% in real terms over the decade from 1999 to 2009, is less than the likely growth in household incomes. For those customers on low, fixed incomes served by companies with current or prospective high bills, the increase may be difficult to afford. It is not open to us or the companies to extend cross-subsidies between better off and less well-off customers within a company's area. We therefore welcome the Government's review of affordability

issues and we have taken a full part in its deliberations. We took an active part in the seminar held with all stakeholders to expose the main issues. We consider that measures such as potential changes to tax and benefits, expansion of the direct payments scheme, and developments to the vulnerable group tariff could all help to mitigate the problems of affordability that could arise from these price limits.

Effective environmental protection

During the course of the review we have raised questions about value for money issues where projects put forward by companies and/or the quality regulators appeared not to meet our long established criteria. These criteria include: a soundly-based needs assessment, clear outputs, wide options appraisals and robust costs and benefits assessments. In the vast majority of cases our challenges have been addressed through changes to the proposals, deletion of the projects or additional information such that we have been able to include well over 95% of the proposals set out in ministerial guidance. However, there remain a small number of proposals where we have had to make some difficult decisions or, where we are able to, we have allowed in price limits for further investigatory work.

We see the open challenge process as a crucial strength of the regulatory regime. Difficult decisions will always be required but these should follow a constructive and well-informed debate between the relevant parties. We see no reason to expect future periodic reviews not to involve similar challenge, informed debate and difficult decisions.

Overall, the improvement programmes included in price limits will enable water companies to make a further substantial contribution towards delivering national and international environmental obligations, many under European Directives. The 2005-10 programmes build on the huge improvements, so far mostly due to water and sewerage companies' activity, in river and coastal water quality over the last fifteen years. The full benefits of the current programmes will not be evidenced for a number of years.

The companies' plans, as taken forward through these price limits, should also help ensure a coherent long-term approach to environmental protection. We are not in a position to assess how significant the programme of environmental improvements for water companies will be in the period beyond 2010. By 2010, one of the main statutory drivers for work on the water environment is likely to be the Water Framework Directive. Draft river basin management plans will be published in 2008 and a programme of measures in each river basin district to deliver the environmental objectives will be established in 2009. This should fit with the timetable for the next price review in 2009. However, the focus of the Water Framework Directive is on the overall environmental outcomes and is not specifically directed at the water companies. The expectation is that the polluter should pay. As a recent Government consultation paper 'Developing measures to promote catchment-sensitive farming' (June 2004) indicated, this particularly puts the focus on diffuse pollution. The significant investment on the control of point source pollution by the water and sewerage companies over the period 1990-2010 should mean that water customers are not expected to continue to fund new investment at the current rate beyond 2009. However, until the plans and programmes of measures are published, it is not possible to estimate the level of expenditure necessary by the first milestone of 2015, the date by which environmental objectives need to be met.

Prudent use of natural resources

In its report to Ministers, 'Maintaining water supply' (July 2004), the Environment Agency has advised that all companies will, if they follow their water resources and drought plans, be able to meet their customers' needs for water for the next five or more years without unnecessary restrictions or inappropriate drought permits and orders. Where justified,

resources have been included in our price limits for investigative and developmental work on long-term enhancements to supply, and on improving the security of supply. We have continued to encourage water companies to control leakage effectively, with companies expecting to reduce leakage by more than 8% between 2003 and 2010, and to carry out their duty of promoting the efficient use of water by customers. Long term, the most effective and efficient way of encouraging water conservation is to relate the price paid to the amount used. Significant progress in the installation of domestic meters will be made over the coming five years and one company, Folkestone & Dover, plans to apply for 'water scarce area status', which would give it greater freedom to install meters.

High and stable levels of economic growth

In relation to the water industry itself, we consider that these price limits provide a demanding but achievable and fair basis for encouraging the industry to further improve its efficiency. This will benefit shareholders as well as customers. In supporting the economy at large, it is essential that the industry should be able to maintain high-quality water and wastewater services. To do so, the complex asset networks developed over 150 years must remain fit for purpose. The development in the last four years of a coherent common framework for the risk-based assessment of long-term spending needs is a major step forward. Many companies have used the framework to good effect in their business plans. On the strength of their work, we have assumed significant increases in spending on maintenance, and noted evidence that asset maintenance may need to be further increased in the period 2010-15.

It is essential that the industry should be able to continue to finance its work. Companies' revenues are insufficient to pay directly for high levels of capital investment. They therefore need access to the financial markets to service increasing debt levels or to raise new equity. Providers of finance need to be confident that companies can make returns that adequately match the risks of investment. We have fully considered these issues at this review.

The size of the capital programme beyond 2010 is not defined but is likely to be substantial and there will be a need to maintain financeability in the longer term. The need for companies to maintain an adequate financial position so that they can continue to raise finance may mean that continuing large capital programmes may have a disproportionate effect on price limits. We have had to allow in the price limits for 2005-10 for higher than average industry returns at the end of the period than at the beginning, due to financing considerations. Such an approach may not be economically sustainable at reasonable cost if companies are required to sustain negative cash flow indefinitely. We shall consider these issues further in preparing for the next price review.

Competition in the water industry

As a result of the Water Act 2003, a new market competition regime for the largest business customers using 50 Ml a year of water or more is likely to come into force in 2005. This will not affect other business customers, at least until after a review due in 2008, or domestic customers. The Government wants to see how price competition evolves before considering extending it to smaller business customers. It is difficult to predict, but we expect price competition to be more of an issue at the price review in 2009.

4. Companies' business plans

4.1 Companies' business plan proposals

Our assessments and analysis started with each company's business plan proposals. These provided us with the information we need to make our decisions. They include each company's views, in detail, on the price limits it believes it needs to fund its proposed activities for the period 2005-10. The plan sets out the company's strategy for the five-year period and the outputs it plans to achieve for the price limits it is seeking.

Table 9 compares companies' proposed average price limits with our price limits.

Price limits proposed in the final business plans were on average 6.2% per year. The increases ranged from 4.3% each year for Yorkshire to 8.7% per year for South West for the water and sewerage companies. The water only companies' business plan proposals ranged from 0.7% each year for Tendring Hundred to 7.7% for Sutton & East Surrey. All companies sought increases to their price limits over the five-year period.

Across the industry, the business plans showed that companies were seeking average bill increases of 29% over the next five years, including a rise of 12% in the first year, 2005-06. The individual company plans spanned a wide range of proposed increases in average bills over the five years; the highest from Southern at 45% and the lowest from Anglian at 17%.

Overall, our determinations represent a reduction to price limits of around 2.0% per year compared with companies' final business plan proposals. In general terms we are content with the strategies proposed by companies. However, we consider that their plans underestimated the scope for further improvements in efficiency and, in some areas, overestimated the costs of carrying out their strategies. We have also made different assumptions about the scale and timing of delivery of the outputs. Taken together, the slightly lower volume of outputs and our challenges to their costs mean that we are able to have lower price limits than those proposed in companies' business plans.

Our price limits for Dŵr Cymru, Yorkshire, Bournemouth & West Hampshire, and South Staffordshire are close to the proposals they included in their business plans. In the cases of United Utilities, Bristol, Folkestone & Dover, Portsmouth, Sutton & East Surrey and Three Valleys, our scrutiny of their plans has led to significant reductions compared with the price limits they proposed for the reasons set out above. The extent to which each of the reasons above is relevant varies from company to company.

Table 9 Comparison of price limits with business plans by company

Company	Average[1] annual price limits 2005-06 to 2009-10 (%)		
	Business plan	Final determination	Difference
Water and sewerage companies			
Anglian	4.6	2.4	-2.2
Dŵr Cymru	5.9	5.4	-0.5
Northumbrian	5.0	3.0	-2.0
Severn Trent	5.6	4.5	-1.1
South West	8.7	6.9	-1.8
Southern	7.7	5.6	-2.1
Thames	6.7	4.1	-2.6
United Utilities	7.8	4.5	-3.3
Wessex	6.5	5.2	-1.3
Yorkshire	4.3	3.9	-0.4
WaSC average (weighted)	**6.3**	**4.3**	**-2.0**
Water only companies			
Bournemouth & W Hampshire	3.2	3.1	-0.1
Bristol	6.2	3.2	-3.0
Cambridge	4.3	2.4	-1.9
Dee Valley	1.9	0.8	-1.1
Folkestone & Dover	8.3	4.8	-3.5
Mid Kent	4.3	3.3	-1.0
Portsmouth	3.7	0.7	-3.0
South East	5.8	3.7	-2.1
South Staffordshire	3.8	3.2	-0.6
Sutton & East Surrey	7.7	2.7	-5.0
Tendring Hundred	0.7	-0.5	-1.2
Three Valleys	6.7	3.5	-3.2
WoC average (weighted)	**5.5**	**3.1**	**-2.4**
Industry average (weighted)	**6.2**	**4.2**	**-2.0**

1 The average for the price limits is the geometric average of the annual price limits.

We scrutinised each company's business plan thoroughly. We examined closely: their financial assumptions; the revenues they said they needed; the quality, environmental and customer service improvements they intended making; and the costs and timing of these. We examined their proposals to invest in the maintenance of their assets and their approach to arriving at their decisions. We also examined their proposals to improve efficiency against their performance to date.

In arriving at our determinations, we have carefully considered the arguments and evidence provided in the plans, and the companies' representations following our draft determinations. Where companies have commissioned studies to support their proposals we have taken the findings into account.

In our original timetable for the price review, all of the final business plans should have been submitted by 7 April 2004. Late arrival of Ministers' principal guidance meant that in practice

business plans were submitted throughout the month of April. This led to a more demanding timetable for both the companies in preparing their plans, and us in scrutinising them. Despite the time constraints, the companies' plans were, by and large, of good quality.

Companies' final business plans were developed and refined from their draft ones. We asked the companies to submit their draft plans in August 2003. These provided us, the companies' customers and other stakeholders with an opportunity to see what effect on customers' bills differing programmes of work could have. It also helped us to understand at an early stage each company's priorities and approach. We met each company to discuss its draft business plan proposals. We scrutinised and challenged elements which appeared to us unjustified, unclear or inconsistent. This process has helped make this price review more transparent than previous reviews. The final plans incorporated companies' reflections on our feedback.

Some companies' proposals changed significantly between draft and final plans both up and down, although the average was only marginally higher. In their draft business plans the companies' preferred approach would have led to average price limits of 6% each year, rather than 6.2%.

Following on from the publication of our draft determinations in August 2004, each of the companies has provided us with written representations. These gave us each company's views on our proposals. We also met each company, in September and October, to discuss their representations in detail. In some cases they have provided us with new information and comments on our approach that have led to changes to our price limits between the draft and final determinations.

4.2 The role of the reporters

Reporters are independent professionals, usually consulting engineers, appointed by each water company with our approval. The reporters' task is to examine and test the water companies' business plans and their business planning processes. They are supported by the companies' financial auditors where appropriate. Reporters worked closely with the companies during the formulation of their business plans to check that they complied with our reporting requirements and guidelines. They exposed, examined and challenged the companies' material assumptions, including the financial ones, underpinning the plans. They paid particular attention to the companies' allocations of projected expenditure between the different purpose categories, particularly for the quality programme and capital maintenance. Reporters provided us with a report for each of the companies, giving their professional opinions of the plans.

These reports helped us to compare information between companies to establish robust assumptions about relative efficiencies and serviceability to customers, and achieve consistency of business planning information between the water companies.

We appointed a team from Babtie Group (consulting engineers) to carry out an external review of the reporter process for the draft business plans. They confirmed that the reporters had scrutinised the detail and the commentary in the companies' draft business plans, and could identify and comment on the key issues and assumptions for each company.

We met each of the reporters to enable them to confirm and expand upon the key points made in their reports. These discussions contributed to our understanding of the final business plans and to our judgements about our determinations. The reporters also provided a commentary on each company's representation following on from our draft determinations. Their commentaries focused on new information provided by the companies to support their representations.

5. Representations on our draft determinations

5.1 Representations received

In 'Future water and sewerage charges 2005-10: Draft determinations' we sought representations from the companies, customers, WaterVoice Committees and other stakeholders. We set out in chapter 6 of that document the issues on which we particularly sought comments. These included:

- the profile of price limits we proposed;
- our approach to the drinking water and environmental programme, including those schemes that we had excluded;
- the balance between increases in expenditure to allow companies to maintain serviceability to their customers and the impact on customers' bills;
- our assumptions on the numbers and associated costs of dealing with properties at risk of sewer flooding; and
- the financial and efficiency assumptions that underlay our draft determinations.

As well as producing the national publication, we also provided each company with a formal letter setting out its draft price limits and the outputs we expected it to achieve for them. These letters are included on our website. Each of the companies was also provided with a confidential supplementary report setting out in more detail the assumptions underlying our draft determinations.

We received more than 500 representations on our draft determinations. These came from a wide range of stakeholders including the water and sewerage companies; each of the WaterVoice Committees; groups that represent particular interests, for example the Royal Society for the Protection of Birds (RSPB), the National Consumer Council, Water UK and the Society of British Water and Wastewater Industries; from individual customers; and elected representatives. A list of the numbers and types of organisations that provided written representations on our draft determinations is provided at appendix 1.

Each company provided detailed written representations on its draft determination in mid-September. In some cases they considered that we had not treated company-specific issues correctly, in others they considered that we had made errors. They also challenged aspects of our approach. As a result of a correction to Thames' draft price limits we published Information Bulletin 03/04 'Ofwat corrects draft determination for Thames Water' in September 2004. The companies also questioned the scope of some of the assumptions underlying our draft determinations. Immediately following the publication of our draft determinations we dealt with specific queries from the companies arising from the detailed information we provided to them with their draft determinations. We also met each company to listen to its material concerns.

As well as receiving written representations from each WaterVoice Committee on our determinations, we met representatives from each Committee. At these meetings the WaterVoice members set out their views on the draft determinations and on the areas where they considered we should revise our approach. They also sought further explanation on

some of our decisions. The WaterVoice Committees play an important part in helping us to understand customers' concerns.

As part of our accountability to Parliament, we also contributed written evidence to the Environment, Food and Rural Affairs Committee's investigation into the price review and provided oral evidence to it on 20 October 2004. We will take account of its report and recommendations at future price reviews once they are available.

The representations on our draft determinations covered a wide range of issues including company-specific ones. The key issues raised and our response are summarised below. A summary of these representations will be included on our website (www.ofwat.gov.uk) as well as copies of each of the representations.

5.2 Price limits and bills

WaterVoice welcomed the reduction in bill increases in our draft price limits compared with the proposals included in companies' business plans. However, it still considers that increases in customers' bills in real terms are of concern to all customers. Some individual customers also expressed concerns about increases in the level of water and sewerage bills, particularly as energy bills and Council Tax bills are also rising.

Reservations were expressed about the sharp rise in price limits in 2005-06, followed by smaller increases in successive years. The WaterVoice Committees stated that individuals on fixed incomes, particularly pensioners, would experience difficulties in meeting their bills. However, in their responses to the consultation companies argued that we should not smooth price limits as they considered this would create financeability problems in the early years and would lead to even higher bills at the end of the five-year period.

In our final determinations we have smoothed the price limits over the first few years for those companies that have asked to do so. The companies concerned are South West, Bournemouth & West Hampshire, Cholderton and Folkestone & Dover. Our reasoning for smoothing the price limits for these companies is set out in chapters 1 and 9.

One WaterVoice Committee also expressed concern that some measured customers' bills might go up by more than is implied in price limits due to: tariff rebalancing between large users and domestic customers; proposed changes to the unmeasured/measured tariff differential; and changes to the balance between standing and volumetric charges. WaterVoice asked us to consider ways to mitigate this possible effect. In our final determinations we have assumed that the new tariff differential approach is phased in, so that measured customers on average do not see price rises that are markedly higher than the price limits. We have also placed limits on the rebalancing between non-tariff basket and tariff basket customers, as set out in chapters 9 and 14.

The message from WaterVoice and customers in the South West, where the average household bill is the highest in England and Wales, is that any increase in water and sewerage charges is unacceptable. A number of representations drew particular attention to the change in typical measured and unmeasured water and sewerage bills over the five-year period, compared with the average household bill. We recognise that our price limits will mean that bills in the South West will be very much higher than elsewhere in the country. This is due to the environmental improvements that South West has made to its coastline, which is long relative to the population that it serves and future improvements to the water distribution system. Appendix 2 illustrates how price limits might affect the measured and unmeasured bills for all companies.

The significant increases in bills in the South West, and elsewhere, are expected to prompt more unmeasured customers to consider switching to a measured supply to save money. We expect more than 100,000 customers in the South West alone to switch to a meter during the five-year period.

A company needs to collect a similar amount of revenue to run its business from its customers, whether or not they choose to switch to a meter. Meter optants, on average, use only a little less water after switching to a meter than before and so place almost the same burden on the company in terms of demand for water. However, costs are increased due to installing, maintaining and reading meters and billing measured customers. As the Water Industry Act 1999 (WIA) requires companies to provide free domestic meters on request, companies do not have full control of their metering programmes and this has led to significant price increases for both measured and unmeasured bills, without a corresponding benefit for all customers. While the costs of metering fall on all measured households as a group the impact of lower bills for measured customers means that any increase in the total revenue requirement impacts on all customers. The greater the number of customers choosing to switch, the greater the impact.

Two organisations representing large non-domestic water customers expressed concerns about the impact on bills for large users who are outside the tariff basket.

More detail on price limits and bills is included in chapter 9.

5.3 Efficiency and outperformance

The companies raised a number of concerns about our approach to future efficiency, although some WaterVoice Committees supported the targets included in our draft determinations.

Water UK commissioned consultants to challenge our work and conclusions. Many companies used the conclusions of these studies in their individual responses to our draft determinations. The companies' representations focussed on our conclusions on the scope for future efficiency; their transparency; and the robustness of our relative efficiency methodology. Our approach to efficiency at this price review is set out in chapter 10.

The companies considered that the assumptions in our draft determinations on the scope for future efficiency were not soundly based and that we should review our assessment of the scope for efficiency and link our judgements more explicitly to the evidence available. Some companies did not think that Thames should be used as the sewerage service benchmark for operating costs because of its unusual operating environment. We have accepted this in the final price limits.

In arriving at our final decisions, we have taken account of the results of our most recent analysis of relative operating efficiency. Combined with our decision not to use Thames as the sewerage service operating cost benchmark, this leads to assumptions on the overall scope that sit within the range of views expressed by consultants. Water UK's work helpfully summarises the consultants' views on the scope for water industry productivity. The water industry specific figures range from 0.4% a year (NERA) to 2.6% a year (Cambridge Economic Policy Associates (CEPA)). We consider the overall scope for operating cost efficiency is 2.4% a year.

The industry also suggested that we had not followed its guidance on best practice in conducting efficiency studies. We do not accept this. We agree with the principles underlying this guidance and our briefs to our advisors make explicit reference to the guidance.

However, some of the principles are not easy to apply in practice, for example, the difficulties associated with preparing bottom-up analysis. Our regulatory judgements are based on sound and explicit analysis. The industry guidance helps us to place a value on those items that contribute to our decisions.

A number of companies suggested that we have revised our efficiency framework from a top-down model that starts from a judgement of the overall scope to outperform the economy as a whole, to a bottom-up model that starts from separate judgements of catch-up and continuing improvement. Some companies suggested that we should limit our expectations to what is necessary to drive the industry to a level of efficiency that is broadly in line with the economy as a whole. They claim this level of efficiency has already been achieved. On the first point, we analyse both top-down and bottom-up assessments to reach a series of robust judgements. On the second point, we see no reason to apply a limit. In acting as a surrogate for a competitive market we use the results of comparative competition to challenge the poorer performers to catch up with their peers. If leading companies are pushing the frontier forward then the poorer performers should also be challenged to keep pace with them. We consider that it is reasonable to arrive at an overall scope for efficiency that is substantially greater than one based on merely ensuring that the industry achieves, and keeps abreast with the economy generally.

The companies also questioned our reliance on the outputs of the econometric models we use to compare companies' relative efficiency. The companies argue that we should take more account of potential errors within the model than we do at present. They cited work undertaken for the industry by Professor Cubbin of the London Business School. He was asked to consider the range of uncertainty within the results of our econometric models. He pointed out that for certain assumptions these could be quite large. We have investigated his concerns and believe that uncertainties of this scale are unlikely under normal operating circumstances, and that other mechanisms and checks that are part of our process already achieve this aim. For example, one of the checks we use is a simple total service model which the Competition Commission published in its reports on the Mid Kent and Sutton & East Surrey referrals in 2000.

The companies criticised our practice of assuming that future efficiency targets apply to all costs. They argue that we should divide costs between those that are controllable and those that are not, as they suggest other regulators do. We are not persuaded. We consider that the controllability of costs varies over time – as technologies change and incentives vary it becomes possible to reduce costs. To remove arbitrarily some costs from the incentive regime seems unsound. We therefore make our decisions on the scope for future efficiency savings based on all costs. However, we accept the point that variations in the profile of costs across companies may not apply equally, but our approach to incentives and uncertainty ensures that the 'downside' risk is minimised.

Some companies raised their concerns that few companies had outperformed our operating cost assumptions at the last price review. They assert that this demonstrates a failure of the incentive regime. While the number of companies showing continuous year-on-year operating cost outperformance is limited, in overall terms the industry has outperformed its price limit assumptions for both water and sewerage. This outperformance would have been greater had there not been cost shocks such as rising power costs and increases in National Insurance contributions. However, even these increased costs have been reflected through RPI to some extent and hence companies are compensated through higher revenues, and through the balancing mechanisms in monetary and fiscal policy.

In their responses to our draft determinations some companies argued that by ignoring some increasing input costs we were effectively increasing our efficiency assumptions. We aim to provide companies with an allowance for operating costs that, all other things being equal will

allow them to run their business day to day. We have only excluded costs where we believe that changes will be accommodated in the RPI adjustment. Where there is some doubt we have put appropriate mechanisms in place.

On capital efficiency the companies considered that our assumptions go beyond what is achievable. They question in particular the reliance we place on the standard costs for capital works in the cost base. They drew attention to the Ove Arup/EC Harris study commissioned by Water UK which concluded that less than 40% of the variance in companies' standard costs arises from inefficiency. They considered that the majority of the differences in standard costs are driven by factors other than efficiency. We have responded to Water UK refuting the basis of this study. Similar criticisms of the cost base were made at the last review. So far in the current period companies are outperforming the catch-up efficiency assumptions derived from the cost base. For the current review we have assumed a lower scope for efficiency than at the review in 1999 and we believe that incentives are in place for companies to continue to outperform.

Companies also considered it unrealistic to assume that all capital enhancement catch-up efficiency can be achieved in the first year and argued that it should be phased over three years. They also queried whether different efficiency targets were appropriate for maintenance and enhancement expenditure, if in some instances the work was similar. Companies have also made representations about the magnitude of our assumptions for capital efficiency.

For capital enhancement expenditure, we expect companies to catch up 75% of the way to the performance of the benchmark companies, as measured by our comparison of procurement efficiency, using the cost base. In view of the time to plan and the type of work – usually discrete asset improvements – we have applied our factors to the whole of the capital enhancement programme for 2005-10. We have not applied these factors to work already confirmed for the start of 2005-10, the early start initiative. Our method for assessing the catch-ups is set out in appendix 3. The overall scope for efficiency improvements is assumed to be lower at this review than at previous reviews as set out in chapter 10. However, in this area most companies have continued to outperform the challenging assumptions we made for the period 2000-05 and there is little evidence that the current targets are not achievable. We believe that the current assumptions are challenging but realistic and will incentivise companies to improve their current performance and outperform our targets.

5.4 Maintaining service to customers

Operating costs

Companies questioned the overall reduction in operating costs that they considered our draft price limits would mean. They did not think they were consistent with recent trends. They considered that, unlike earlier price reviews, base costs are rising rather than falling.

In our draft determinations, we made an allowance for increases in energy costs during the period 2005-10. The companies did not, however, consider this allowance to be sufficient. They suggested that we should take account of the latest analysis from OXERA, which suggests that energy costs will increase by more than we assumed in our draft determinations. We have accepted this evidence and assumed a 40% increase in the level of energy costs over the period 2005-10 in the final price limits.

Most of the companies considered that bad debt and debt management costs will rise by more than inflation, given that the draft determinations projected high increases in bills. They considered that improved debt collection would not compensate for rising debt. The WaterVoice Committees also expected customer debt to rise in the five-year period, although some Committees supported our decision not to make allowances for this in our draft determinations. As at the price review in 1999 we proposed a notified item for debt in our draft determinations. Some companies considered that we should include a central estimate of customer debt rising in line with price limits with a two-way notified item, which would have allowed us to make adjustments up or down through an interim determination. We have decided that companies should have a strong incentive to restrain increases in bad debt and debt management costs. We have accordingly made no further allowances for bad debt in our final price limits. However, we have retained a notified item for unavoidable increases. In response to companies' concerns we have modified the notified item to recognise the conditions under which water companies operate, as compared with other service providers.

A number of companies questioned the approach we have taken to funding pensions, particularly by only allowing funding for 50% of any deficit not already included in base costs at this price review. We expect companies to take the action on the remaining deficit that they consider prudent and appropriate. Our approach strikes a balance between customers, shareholders and employees.

Some companies considered that the draft determinations underestimated the likely result of changes to the level of business rates. We have worked closely with the Valuation Office Agency, the Office of the Deputy Prime Minister, and the Welsh Assembly Government to ensure that price limits take account of the appropriate costs.

On future abstraction charges, many companies considered that we should assume that the Environment Agency's abstraction charges will rise by more than inflation as they have in previous years. We have included a one-way notified item to reflect the uncertain position on whether charges for abstraction and discharges may rise above inflation. See chapter 16 for an explanation of all of the notified items.

Some companies disagreed with our view that it was not necessary to make a specific allowance for the Landfill Tax or rising insurance premiums. Our view remains that the Landfill Tax and insurance costs are not specific to the water industry and as such any changes in the companies' costs will feed into RPI and need no specific price limit adjustment.

Capital maintenance expenditure

Companies, some WaterVoice Committees, and customers urged us to ensure that companies had sufficient revenue to maintain their assets. We have looked closely at these representations and where appropriate we have allowed for additional expenditure for capital maintenance. This has resulted in an increase in the overall capital maintenance allowance of around 3% above our draft determinations. Our final determinations assume up to 22% more than was allowed for capital maintenance expenditure for the period 2000-05 and 13% more than the companies' actual and estimated expenditure for that period. This should enable all companies to maintain, or achieve and maintain, at least stable serviceability for customers for the foreseeable future.

Some individual companies questioned our assessment of the serviceability of their assets, given the amount allowed for capital maintenance that we included in our draft price limits. They considered that the assumptions made in our draft determinations would not allow them to continue to maintain their assets. We have considered each company's case at each sub-service level, eg water infrastructure, and in some cases we have increased the amount

allowed in price limits where the company has developed its case. All companies are required to maintain, or achieve and maintain, stable serviceability to customers during the period 2005-10.

Thames made sustained representations on the infrastructure expenditure allowed in our draft determination. It argued that the amount allowed was inadequate and the implied unit rates for the installation of mains and sewers were unachievable. Thames also considered that it would be unable to achieve the required outputs to restore stable serviceability in its underground assets within the timescale proposed. Thames also argued that the efficiency factors that we had assumed made the overall package too challenging. We have reviewed the revised information provided in its representations and we accept that the draft determination may have contributed to a high risk of failure to achieve the outputs on the company and its customers. We have therefore revised the unit rates in the calculation of the allowance for renewing water mains in London to reduce this risk in the company's final price limits.

A number of companies criticised our approach and stated that the bandings we use to assess the level of companies' capital maintenance were too coarse. They claimed that coarse bands would result in relatively large changes in the allowance as a result of small differences in assessment scores. We believe that the bands we use are appropriate as only a proportion of the future expenditure is considered. This covers around 17% of the industry's capital maintenance proposals. We have made more detailed checks where a company's plan is close to the boundary. In general, companies have been given the benefit of the doubt, which tends to result in a higher proportion of plans at the bottom of each band. The effect of narrower bands would have been to reduce the total allowance for the industry.

A number of companies objected to the changes we made in our scoring of their common framework approach between our assessment of their draft business plans, submitted in August 2003, and their final plans. Out of the 64 sub-services, 21 have improved by one or more band and 8 have gone down by a band between our draft and final assessments. We had expected an overall improvement in the companies' approach at least partially due to the detailed feedback that we provided to companies on their draft business plans.

Companies asked why our assessments included them in a lower band. There were a number of reasons for this.

- A more detailed analysis, including more thorough consistency and sensitivity checking, was carried out on the final business plans as the outputs were used for price setting. The outputs from the draft business plans were primarily used to advise the companies of the status of the plans.

- Companies changed their approaches significantly between submission of each of the plans. Where changes were not fully justified this reduced the robustness of the plan.

- There had been a change in the quality of the data or commentary by the reporter on the approach taken by the company.

Odour

The cost of maintaining the current odour control measures at existing sewage and sewerage facilities is fully allowed for in companies' capital maintenance expenditure within final price limits, subject to appropriate efficiencies. This is an issue which has generated increasing public interest in recent years. All sewerage companies proposed an increase in expenditure on odour control but in most cases the outputs were not well defined. In their

representations a number of companies argued that we should include more for them to deal with odour. However, in general they did not submit additional supporting information or revised justifications that could have significantly improved the case presented in the final business plans. The exceptions were Thames and Southern.

There were a number of representations from individuals and organisations about smells and fly nuisance coming from the Mogden sewage treatment works in London. As a result of these representations we have allowed a significant increase in mitigation measures at Mogden and made the work a defined output, to be completed in two phases during the period 2005-10. We have also allowed for increased odour control, as defined projects, at several of Southern's sites.

In a recent court case about Mogden, the court was satisfied that the level of odour did amount to a legal nuisance but Thames was given time to achieve compliance because the engineering works required to alleviate the nuisance were recognised to be extensive and of long duration.

5.5 Maintaining the balance between supply and demand

Our approach on the supply/demand balance attracted relatively few comments from respondents, although companies raised a wide range of issues in their detailed representations.

Some companies disputed our decision not to include additional funding of their water efficiency activity as an enhancement of service, where there was no associated improvement to their supply/demand balance position. In general, we expect most companies' water efficiency activity to be financed as part of their base service provision. The Environment Agency considered that demand management should play a greater role in the supply/demand balance, but welcomed investment in leakage reduction and metering.

WaterVoice Thames expressed strong support for the development of a desalination plant at Beckton in East London. The Committee also considered that detailed work on the planning of a large new reservoir in Oxfordshire should go ahead before 2010. Both of these items are included in our final determinations.

Most stakeholders were content with the assumptions in our draft determinations about metering. One or two companies felt that our assumptions about optional metering were too low, while WaterVoice North West felt that funding should be diverted from optional metering in favour of dealing with sewer flooding problems. In our final determinations we have continued to use the available statistical evidence to challenge companies' forecasts of metering, where appropriate. We have also included a stepped increase in selective metering for a number of companies. The Environment Agency also suggested that some companies should encourage metering at a faster rate than the companies had planned.

In our draft determinations we assumed higher developer contributions than companies did for financing new development capital expenditure. A number of companies considered that they would not be able to recover the amounts we had forecast, and that their ability to recover contributions from developers would be reduced by changes resulting from the Water Act 2003. We did not accept all of the points made by companies, but have changed our assumptions for our final determinations, as set out in chapter 12.

The House Builders Federation set out its view that the Water Act 2003 will improve transparency about the costs of new development, and enable competition to take place.

It expressed its belief that new development was funded entirely by developers. It also sought clarity on the contribution made by infrastructure charges to the costs of developing local networks to serve new customers.

Leakage

We did not receive any representations on our methodology for assessing and implementing future leakage targets. The economic level of leakage (ELL) concept is well established and widely accepted as an appropriate tool for longer-term leakage planning.

Some companies questioned whether their targets were achievable given our adjustments to the capital maintenance programmes set out in their final business plans. We were asked to consider lower targets or increased levels of operating expenditure if the companies' original capital maintenance claims were not reinstated. However, following our integrated approach to leakage, capital maintenance and supply/demand we consider that the targets we have set are necessary and achievable.

5.6 Quality, environmental and service improvements

The drinking water quality and environmental improvement programme

More than 300 individual customers raised the issue of investment in environmental improvements. Many were responding to a campaign by the RSPB to ensure that schemes that were 'parked' for the draft determinations were included in the final determinations. Nearly two-thirds of these customers expressed their willingness to pay for these environmental improvements. They expressed the view that investment in the environment now benefits future generations and that the additional cost of these schemes was in their view small. In our final determinations we have considered the points made alongside additional information from all stakeholders, including the quality regulators and companies.

The RSPB and others also considered that table 4 in our draft determinations (the equivalent of table 6 in this publication) was misleading in showing that a substantial proportion of the increase in bills over the period arises from environmental improvements. They argued that the proportion should be lower as the new environmental programme contributes only 20% of the total capital expenditure programme at draft determinations of £15.7 billion. However, this argument is misguided. The table concerns marginal changes to bills. Most of the bill is driven by the need to finance continuing services including base capital expenditure and maintenance. A significant proportion of the increase in bills is necessary to finance the building of new capital projects to improve the environment. In chapter 2 we clarified how we arrived at the figures in this table. If we examine instead the composition of bills as a whole (as set out in chapter 9), then the funding costs associated with past improvements for environmental, drinking water quality, supply and demand, and service enhancements account for around a third of all bills.

Some respondents to our draft determinations identified particular projects that they considered should be included in our final determinations. For example, low flow rivers in the Wessex area, and the Brennand and Whitendale low flow schemes in United Utilities' area. Final ministerial guidance explained that the work associated with any reduction of abstraction for environmental purposes and any changes in licences should be funded using the compensation route set out in the Water Resources Act. We have therefore not included the costs of these abstraction licence changes. We have assumed that some preliminary investigative work will take place to inform the later stages of these projects, which will now be funded from abstraction charges.

There was also considerable support for the land management project in United Utilities' area. We have allowed in United Utilities' price limits for research to be carried out on the impact of farming methods in two areas, including the Dark Peak catchment and the Bowland Fells area. We assume that this research will also be supported by the Government with some agri-environment grants alongside the contribution made by water customers.

Some representations supported the need for investment in the Thames Tideway scheme. We have allowed in price limits for smaller scale measures to reduce the impact of storm water on the Thames Tideway, and to investigate longer term solutions.

Companies also disagreed with rephasing of the mains rehabilitation programme in our draft determinations and in some cases have met the DWI who have confirmed that no change should be made to the phasing of this work.

The WaterVoice Committees sought more detail on projects included in price limits. We have provided each company with a full schedule of the quality improvement outputs we expect it to deliver as part of our final determinations, and a timetable for their delivery. We will also place on our website lists of the projects we expect the companies to deliver as a result of these price limits.

Some business users and WaterVoice Committees thought that the environmental and drinking water quality programmes should represent value for money and that cost benefit analyses should be prepared for all statutory projects.

Sewer flooding

As well as the sewerage companies, all WaterVoice Committees raised the issue of sewer flooding in their representations. A number of MPs have also raised this issue with us particularly in connection with areas served by Thames and United Utilities. Representations expressed disappointment with the levels of improvements included in our draft price limits, and particularly their perception that our decisions only include schemes that cost up to a value of £120,000. The Committees urged us to reconsider our policy and to take further account of the prioritisation schemes put in place by the companies. The £120,000/property cost-benefit cap on sewer flooding schemes was not considered appropriate, particularly as customers with severe or frequent flooding that would be expensive to remedy might be left without a resolution. WaterVoice believes that this is a top priority area for customers, who would be willing to pay the price increases associated with reinstating companies' programmes.

We have reviewed our approach in the light of the representations, and our final price limits allow for either a capital scheme or measures to reduce the risk or impact of sewer flooding for every currently known problem where the companies proposed taking action by 2010. This is dealt with in more detail in chapter 13.

5.7 Revenue

A number of companies felt that bills for large users should rise more slowly than those for tariff basket customers. They argued that many of the drivers of higher water bills did not apply to large users. Our assessment in the final determination reflects a general presumption that water prices for all customers should move broadly in line. We have assessed the drivers of changes in water bills and not found strong evidence to support a markedly different approach for large users of potable water. We have therefore assumed that their prices will increase by at least 75% of the relevant price limits.

WaterVoice South West expressed a number of concerns about our approach to tariffs, in particular that standing charges should be higher, and that our current approach to tariffs discriminates against unmeasured customers. We continue to believe that our approach to tariffs, as reflected in the tariff differential, is appropriate. We have taken the recently revised tariff differential methodology into account in our final determinations.

5.8 Financial issues

The companies considered the weighted average cost of capital (WACC) included in our draft determinations was inadequate. They considered that the inclusion of allowances for financeability suggested that the WACC was too low. We have not changed our assumption on the WACC compared to the draft determinations. The WACC we have used is towards the upper end of a possible range supported by the evidence. It must also be viewed in the context of the other assumptions underpinning price limits and the regulatory protections available to companies. There are a number of factors that affect the share price movements of the listed water stocks, but the upward trend in share prices since publication of the draft determinations partly reflects the ending of a period of uncertainty and a generally balanced reaction from the City. It does not appear to support a position that the assumed cost of capital was too low.

The water only companies considered the small company premium included in our draft determinations to be insufficient. Some companies consider it is inappropriate for us to use four size bands to determine the small company premium for water only companies. They do not consider that four distinctive bands can be justified using the regulatory capital value.

We continue to believe that on the basis of their 2004-05 regulatory capital values, the water only companies fall into four size bands. We have sought to avoid marginal effects in differentiating between companies by adopting bandings that are clearly distinguishable. Our projected regulatory capital values (RCVs) over this price review period show that the four bands do not become less distinct by 2009-10. It remains our view that certain fixed and variable costs, both on debt and equity, have a proportionally larger impact on smaller companies and their investors, and that they should be compensated accordingly. For final determinations we have therefore retained our approach of dividing companies into four bands of premium based on size. However, we have taken a more cautious approach to interpreting the empirical data in relation to how long investors hold shares in the water only companies than at the draft determinations. Additionally, we recognise the need to compensate marginal investors who may invest for less than the average holding period. We have therefore concluded that a five-year holding period assumption is appropriate. This has the effect of increasing the small company equity premium compared to the draft determinations.

The water only companies questioned our approach of using industry-wide benchmarks for financial ratios when determining the need for financeability revenue. They believed water only companies should be judged against higher financial ratios than water and sewerage companies. We have reviewed our approach and examined the position of each individual water only company carefully. The increase in the small company equity premium should, all other things being equal, result in better ratios for the water only companies. Taking the package as a whole the ratios for the water only companies are better than those for the water and sewerage companies. For example, the majority of water only companies have an average level of cash interest cover of above 3.5 times compared to around 3.0 times for the water and sewerage companies. Consequently, we have not provided for an explicit uplift in ratios for the water only companies.

A small number of companies have challenged our methodology for calculating their infrastructure renewals charge. They consider that our approach does not fully remunerate the company for any prepayment of expenditure that builds up over 2005-10. These companies appear to have misinterpreted our methodology. We have not changed our approach to calculating infrastructure renewals charges, which aims to fully remunerate companies for the level of infrastructure renewals expenditure assumed when we set price limits. Where companies have made a convincing case for expenditure greater than assumed in price limits at the last review, we have increased the infrastructure renewals charge accordingly. In other cases, the greater expenditure would be reflected in the companies' regulatory capital value.

5.9 Uncertainty and risk

The companies are concerned about the number and scale of uncertainties which they feel could impact adversely on them during the period. The WaterVoice Committees are keen to ensure that as far as possible the price limits set are those that apply for the five-year period they cover; more frequent interim determinations could damage the credibility of the regulatory process.

In our draft determinations we set out the issues which we felt could not be fully reflected in price limits because of the degree of uncertainty around them. These were issues which we felt, should they have a significant effect on an efficient company, could be a reason for changing price limits. These notified items are discussed further in chapter 16. In response to representations we have included a new notified item for the possible impact on taxation charges of the tax treatment of infrastructure expenditure, following the introduction of International Financial Reporting Standards. We have also expanded the scope of the notified item on the costs of making abstractions and discharges, and refined the conditions for the notified item on bad debt and debt collection costs.

The majority of companies argued that we should reinsert in their licence conditions the protection against changes in construction prices relative to general inflation, where they do not have this protection already. We had already stated that this was part of a package of wider licence modifications that we will be discussing with the companies after the price review. However, we have assumed in our final price limits that construction prices will rise by slightly more than the general rate of inflation for those companies that do not have protection against this in their licences.

A number of companies suggested that a combination of the assumptions made on operating and capital cost efficiencies included in the draft determinations and their differing views on future costs, meant there was insufficient headroom in the projected financial ratios to absorb potential cost shocks. In their view, this increases risk in an asymmetric manner and could lead to companies' financial ratings falling below those comfortably within the investment grade category. Some companies sought to quantify this using a risk modelling technique developed for the industry known as 'Liquid Risk'. This technique calculates the likely probability of achieving a desired financial outcome, given a range of input assumptions.

Companies argue that this risk of underperformance could be offset directly by easing the cost and efficiency assumptions or indirectly by allowing greater 'headroom' in the financial indicators. Our response in respect of representations on operating costs and efficiency assumptions is set out earlier. However we do not believe that higher price limits are required simply to provide a cushion against cost shocks. The package of financial ratios that we have set out in chapter 15 does not represent a floor. There remains some scope for companies to absorb unanticipated downside risk and remain within the investment grade credit rating range.

6. How we set price limits

Our determinations will enable the companies to:

- run their businesses day-to-day to meet all existing obligations, together with new service, quality and environmental obligations;
- maintain their assets for current and future customers;
- ensure a sufficient balance between supply and demand for the water and sewerage services; and
- make other service improvements, for example reducing the number of homes at risk of sewer flooding.

These outputs determine the level of price limits.

6.1 Our approach

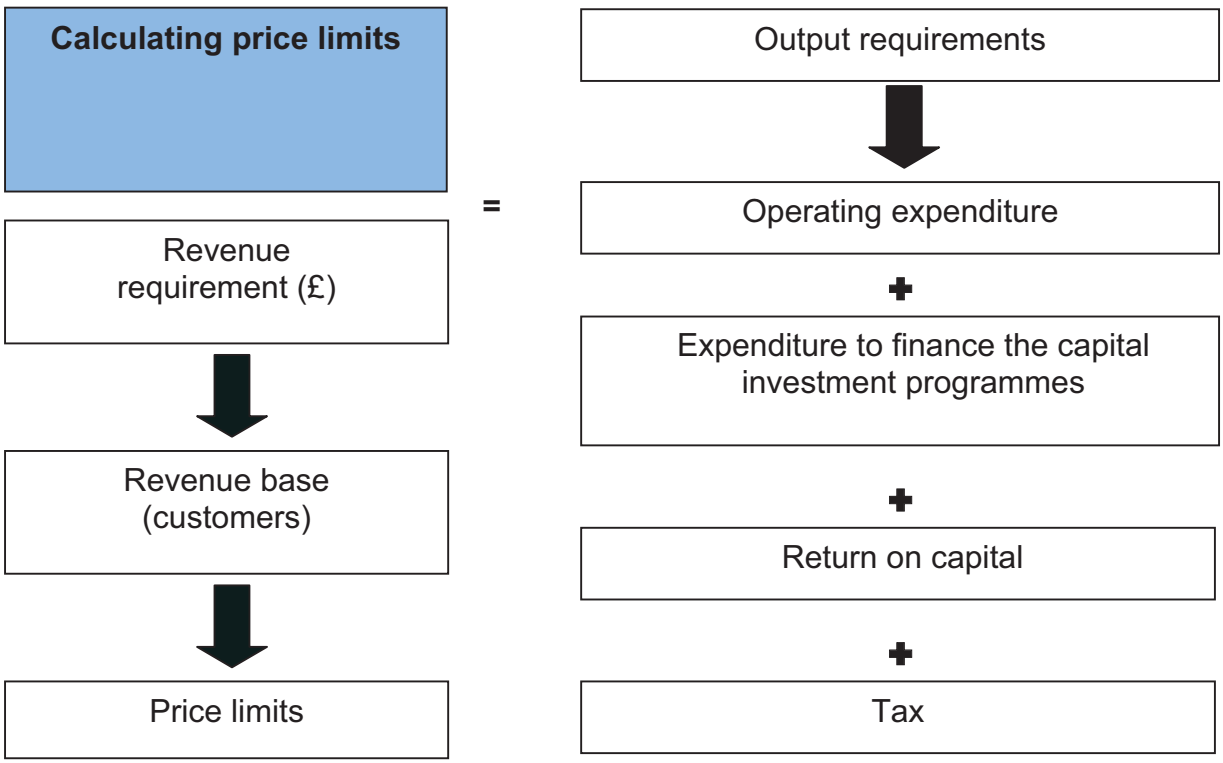
We have adopted an efficient and transparent approach to the review. We consulted on, then published, our approach in our methodology paper.

The water companies are regional monopolies that only face competitive pressures for a few very large customers. Consequently, it is our role to limit the prices that companies can charge and to set a framework that simulates the pressures of a competitive market. We must also set price limits that allow efficient companies to carry out their functions and also to finance them.

Our determinations take account of the information submitted by companies in their final business plans, their representations on our draft price limits, the reporters' reports, guidance received from the quality regulators, Defra Ministers and the Welsh Assembly Government, and representations from stakeholders on the decisions we published in August.

Figure 2 sets out our broad approach to setting price limits. It is a simple representation of the financial model that we use.

Figure 2 Calculating price limits



Each company needs to collect sufficient revenue to finance its operating expenditure and the capital investment programme. It also needs to be able to finance previous capital investment through the return the company earns on its regulatory capital value. The regulatory capital value is the value of the regulated business. In addition, the water industry pays tax. We also allow for any incentive allowance for outperformance in the previous five-year period. The sum of these costs is called the revenue requirement.

Changes to the number and mix of measured/unmeasured customers affect the revenue received. Rising bills may prompt more customers to seek a meter to save money; unmeasured bills may rise as a result to ensure that the company has sufficient revenue to meet its obligations.

The percentage change between the revenue requirement and the revenue expected from customers is the price limit. Finally, we check that the outcome of this calculation provides price limits that will enable the company to be financeable.

7. Company summaries

This chapter sets out the key elements of our final determinations for each company. It includes the effects on customers' bills and the outputs that we expect each company to deliver. This is to help customers and others to understand what companies will deliver for the price limits we set.

The position for each company is set out under the following headings.

Price limits

This sets out the price limits for each company and, for comparison, the price limits that each company sought in its business plan.

Expected effect on household bills

Bills may not change exactly in line with price limits. The effect of the price limit on average annual household bills will depend on the actual volume of water used by metered customers and the number of metered customers. The figures shown here are based on our projections of how bills will change over time.

The increase in average household bills shown for each company is likely to be less than that suggested by the cumulative price limits for 2005-10. This is because price limits need to be higher to allow for the loss of revenue that companies experience when household customers take up optional meters.

The typical metered customer is the customer with average consumption in 2002-03, whose consumption remains constant each year to 2009-10. The typical unmeasured customer is a customer with an average rateable value in 2002-03 who remains on an unmeasured basis (ie does not switch to a meter). The figures for typical bills illustrate for customers the change in bills, year on year, that they can expect, assuming they remain on the same charging basis.

We have also set out in appendix 2 some further examples of changes in bills for customers with different charging or consumption characteristics.

We have presented all data relating to bills in current prices (using the November 2003 RPI). This means that the bills for 2004-05 (ie the current year) set out in this chapter broadly correspond to those included in our 'Tariff structure and charges – 2004-05 report' (May 2004). Other data in each table is in 2002-03 prices unless otherwise stated.

Company's strategy for 2005-10

Each company published a summary of its business plan in May 2004. This set out the company's strategy for the period 2005-10, including the activities it regards as priorities for the period. For ease we have included the key improvements each company wishes to make. Copies of the summaries produced by the companies are in our library and a one-page summary is on our website.

WaterVoice Committee's comments on the draft determinations

Each WaterVoice Committee provided us with representations on our draft determinations. This section includes a summary of the Committee's views on each company's draft determination.

What the price limits will enable each company to deliver

The formal determination notification that we have provided to each company provides the price limits and summarises the outputs we expect them to deliver. These are available on our website. We have also provided each company with a more detailed confidential supplementary report.

We have examined each company's plan thoroughly. We have compared its proposals to its current activities and to the activities of other companies. In some cases we have endorsed a company's proposals and in others, following close scrutiny of its proposals, we have arrived at a different view of what the company can achieve and at what cost.

Efficiency and incentives

We have included in the company summaries the efficiencies and incentives that we assumed in setting price limits.

For operating expenditure, we show the annual average percentage efficiency factor for each service.

The capital efficiency improvement is the total impact of the efficiencies we have applied to each year of the capital programme. This is the proportion removed due to assumed efficiency expressed as a percentage of the capital programme for 2005-10.

For capital maintenance, where we have accepted a company's plan, these efficiency percentages take account of the company's catch-up efficiencies, and the phasing in of our catch-up efficiency over three years. For capital enhancement the full assumed efficiency is applied from the first year.

We also show the increase or decrease in price limits, where applicable, under the overall performance assessment.

Capital and operating expenditure

The company table sets out how we have assumed the capital and operating expenditure for each company will be allocated between the different output categories.

To help make comparisons between companies, each individual company's capital and operating expenditure requirements are also expressed as £ per billed property each year. The £/property figure quoted excludes properties no longer billed. This better reflects the operating and capital expenditure being paid for within price limits by customers.

What is driving the changes in bills?

At the industry level, table 6 in chapter 2 sets out what is contributing to changes in the average household bill over the five-year period to 2009-10. An equivalent table has been provided for each company and a comparison is made to the company's business plan proposals. All figures in this table are in current prices.

Anglian Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**3.8**	**0.0**	**2.8**	**2.7**	**2.7**	**2.4**
Company's business plan		5.4	2.0	4.7	5.2	5.9	4.6
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill (water)							
– Anglian area	122	133	133	136	138	140	15
– Hartlepool area	94	103	103	105	107	108	15
Average annual household bill (sewerage)	172	169	166	168	171	173	1
Average annual household bill (total)[1]	**294**	**302**	**299**	**304**	**309**	**313**	**7**
Typical measured bill							
– Anglian area	245	253	256	262	267	272	11
– Hartlepool area	70	74	76	79	81	84	19
Typical unmeasured bill							
– Anglian area	355	370	368	380	391	403	14
– Hartlepool area	97	106	106	109	111	113	17

1 The total bill is for the Anglian area only.

Company's strategy for 2005-10

- Provide best value water and wastewater services to customers.
- Maintain and improve service levels to customers while keeping prices as low as possible.
- Meet water quality and environmental standards and improve performance where supported by the principles of sustainable development.
- Deliver appropriate and sustainable returns to investors so that the company maintains the ability to attract capital.
- Develop and retain high calibre people with the commitment, capability and enthusiasm to deliver an efficient public service.

WaterVoice Eastern's comments on the draft determination for the Anglian area

- The proposed combination of reduced expenditure and tough efficiency targets does not represent good value as customers may notice a reduction in the level of service. The current determination should not be viewed in isolation from previous and future determinations.
- Bill increases should be smoothed over the five years, eliminating any negative price limits.
- The most serious sewer flooding problems should be dealt with as a priority and properties should not be excluded because solutions exceed £120,000. WaterVoice believes that it would cost less than £1 on bills to address the most urgent cases. This is good value for money and is consistent with customer priorities. Additional allowance should also be made for mitigation measures.
- Meter installation rates should be increased, as metering assists the supply/demand balance and gives customers an element of control over their bills.
- The predicted population increase will put a strain on the existing sewerage infrastructure and water resources, and allowances should be made for this.
- Sufficient funding should be included for capital maintenance to at least prevent an increase in bursts and interruptions to supply.

WaterVoice Northumbria's comments on the draft determination for the Hartlepool area

- To address issues of affordability and price stability the Committee would prefer a smoother profile of prices. Ofwat should reassess the large cut in capital maintenance and make greater provision for meter optants.

These price limits will enable Anglian Water to:

- Continue to maintain a safe, reliable water supply to customers and effective treatment and disposal of sewage.
- Increase activity to maintain its pipes, sewers and treatment works.
- Meet the demands of new and existing customers for a reliable water supply and sewerage service.
- Install 89,000 optional meters by 2009-10.

- Deliver required drinking water and environmental quality improvements, including:
  - 25 projects to reduce nitrates in drinking water;
  - 23 projects driven by the Habitats Directive; and
  - connecting 6,692 properties to the public sewerage system.
- Resolve or mitigate all known problems identified in the company's plan where overloaded sewers cause flooding inside people's properties.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Anglian Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 1.2% (water) and 2.0% (sewerage);
  - capital maintenance efficiency improvements of 3.4% (water) and 4.9% (sewerage);
  - capital enhancement efficiency improvements of 13.5% (water) and 14.8% (sewerage);
- 0.1% added to price limits in recognition of Anglian Water's good service.

Expenditure £m	**Capital expenditure (net) Five-year total**			**Operating expenditure Annual average**		
	Water	**Sewerage**	**Total**	**Water**	**Sewerage**	**Total**
Base service:				132	159	291
Infrastructure renewals expenditure	143	111	254	—	—	—
Non-infrastructure capital maintenance	208	308	516	—	—	—
Supply/demand balance	161	13	175	1	1	2
Quality enhancements	89	374	463	1	8	9
Enhanced service levels	0	59	59	0	0	0
Total	**601**	**865**	**1,466**	**134**	**168**	**302**
£ per property per year	62	70	132	70	68	137

What is driving the changes in bills? (2004-05 prices)

		Company business plan *			**Final determination**		
		Water	**Sewerage**	**Total**	**Water**	**Sewerage**	**Total**
Average household bill in 2004-05 (£)		**121**	**171**	**292**	**122**	**172**	**294**
Less	(1) past efficiency savings and outperformance	**–**	**(2)**	**(2)**	**–**	**(1)**	**(1)**
	(2) scope for reduction through future efficiency improvements	**(1)**	**(3)**	**(4)**	**(8)**	**(14)**	**(22)**
Plus	(3) maintaining base services of which:	**9**	**(11)**	**(2)**	**10**	**(1)**	**9**
	a) changes in revenue	(3)	(4)	(7)	(5)	(6)	(11)
	b) changes in operating costs	8	4	12	9	4	13
	c) changes in capital maintenance	5	(9)	(4)	7	1	8
	d) changes in impact of taxation	(5)	(5)	(10)	(2)	(1)	(3)
	e) financing	4	3	7	1	1	2
	(4) maintaining security of supplies to all customers	**14**	**4**	**18**	**8**	**1**	**9**
	(5) the impact of improvements in drinking water quality	**13**	**–**	**13**	**8**	**–**	**8**
	(6) the impact of environmental improvements	**–**	**26**	**26**	**–**	**14**	**14**
	(7) improvements in service performance	**–**	**3**	**3**	**–**	**2**	**2**
Average household bill in 2009-10		**156**	**188**	**344**	**140**	**173**	**313**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Dŵr Cymru (Welsh Water)

Price limits (%)	2004-05[1]	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**14.2**	**3.6**	**4.1**	**3.3**	**2.2**	**5.4**
Company's business plan figures		21.5	3.0	2.5	2.5	1.5	5.9
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill (water)	123	144	146	149	152	153	24
Average annual household bill (sewerage)	163	178	183	190	195	199	22
Average annual household bill (total)	**286**	**323**	**329**	**339**	**347**	**352**	**23**
Typical measured bill	177	205	215	222	227	228	29
Typical unmeasured bill	314	358	368	384	399	411	31

1 The average household bill for this year is stated after the customer rebate of around £9.

Company's strategy for 2005-10

Dŵr Cymru's goal is to be seen by customers and other stakeholders as a leading water company in the sector. The main elements of Dŵr Cymru's strategy are:

- Maintaining the current generally high standards of service;
- Areas for improvement should reflect, as far as possible, customer priorities; and
- Improvements to drinking water quality and environmental quality, as determined by Ministers and regulators, should represent good value for money for its customers.

WaterVoice Wales's comments on the draft determination

- Price levels are already well above the 'national' average. The 2005 proposed increase is more than six times inflation, and well beyond what market research indicates customers are prepared to pay.
- The large first year increase will cause affordability problems, especially for those on fixed or low incomes. Increases should be lower, and ideally should be smoothed over the five years.
- The lower bill increases proposed for later years leave too many uncertainties. This may lead to interim determinations in later years and further bill increases.
- A large part of the bill increase is due to decisions of the Government and its agencies. This sits uncomfortably with government guidance that bills should be affordable. We question whether many of the environment projects should be financed through water bills.
- The highest priorities of customers, safe and reliable tap water and an end to sewage flooding, should be given their proper priority against all the other calls being made on customers' money. In particular, sewage flooding projects should not be seen as a soft option for arbitrary cuts.

These price limits will enable Dŵr Cymru to:

- Continue to maintain a safe, reliable water supply to customers and effective treatment and disposal of sewage.
- Increase activity to maintain its pipes, sewers and treatment works, including 33 projects to control odour from sewage and sludge treatment facilities.
- Meet the demands of new and existing customers for a reliable water supply and sewerage service.
- Install nearly 117,000 optional meters and 2,500 selective meters by 2009-10.
- Deliver required drinking water and environmental quality standards, including:
  - improvements to 447 unsatisfactory intermittent discharges; and
  - phosphorus removal at 21 sites to protect special areas of conservation.
- Resolve or mitigate all known high risk problems identified in the company's plan where overloaded sewers cause flooding inside people's properties.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Dŵr Cymru

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 1.8% (water) and 2.0% (sewerage);
  - capital maintenance efficiency improvements of 6.3% (water) and 4.0% (sewerage);
  - capital enhancement efficiency improvements of 8.3% (water) and 9.1% (sewerage);
- 0.1% added to price limits in recognition of Dŵr Cymru's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total			Operating expenditure Annual average		
	Water	Sewerage	Total	Water	Sewerage	Total
Base service:				106	94	200
Infrastructure renewals expenditure	130	94	224	—	—	—
Non-infrastructure capital maintenance	147	171	318	—	—	—
Supply/demand balance	36	19	55	0	1	1
Quality enhancements	209	307	516	0	2	2
Enhanced service levels	0	32	32	0	0	0
Total	**523**	**621**	**1,145**	**106**	**97**	**203**
£ per property per year	81	95	177	83	74	157

What is driving the changes in bills? (2004-05 prices)

		Company business plan *			Final determination		
		Water	Sewerage	Total	Water	Sewerage	Total
Average household bill in 2004-05 (£)		**123**	**162**	**285**	**123**	**163**	**286**
Less	(1) past efficiency savings and outperformance	**(1)**	**(3)**	**(4)**	**–**	**(2)**	**(2)**
	(2) scope for reduction through future efficiency improvements	**(14)**	**(10)**	**(24)**	**(7)**	**(10)**	**(17)**
Plus	(3) maintaining base services of which:	**25**	**19**	**44**	**23**	**15**	**38**
	a) changes in revenue	10	8	18	8	9	17
	b) changes in operating costs	9	11	20	7	11	18
	c) changes in capital maintenance	9	1	10	9	(1)	8
	d) changes in impact of taxation	(4)	(4)	(8)	(2)	(5)	(7)
	e) financing	1	3	4	1	1	2
	(4) maintaining security of supplies to all customers	**4**	**3**	**7**	**3**	**2**	**5**
	(5) the impact of improvements in drinking water quality	**14**	**–**	**14**	**11**	**–**	**11**
	(6) the impact of environmental improvements	**–**	**36**	**36**	**–**	**29**	**29**
	(7) improvements in service performance	**–**	**3**	**3**	**–**	**2**	**2**
Average household bill in 2009-10		**151**	**210**	**361**	**153**	**199**	**352**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Northumbrian Water

Price limits (%)	2004-05[1]	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**6.5**	**3.7**	**3.2**	**1.0**	**0.6**	**3.0**
Company's business plan		11.1	6.1	4.2	3.0	1.0	5.0
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill							
– Northumbrian area	100	106	109	113	114	114	14
– Essex & Suffolk area	132	141	146	151	152	153	16
Average annual household bill (sewerage)	132	137	141	144	145	146	11
Average annual household bill (total) [2]	**232**	**243**	**250**	**256**	**258**	**260**	**12**
Typical measured bill							
– Northumbrian area	206	220	231	238	240	241	17
– Essex & Suffolk area	96	103	108	112	112	112	17
Typical unmeasured bill							
– Northumbrian area	237	251	259	267	271	274	15
– Essex & Suffolk area	145	154	159	165	167	168	16

1 The interim determination of price limits for Northumbrian Water increased its price limit to 10% from zero in 2004-05. This has reduced the price limit that Northumbrian Water would otherwise have been allowed in 2005-06.

2 The total bill is for the Northumbrian area only.

Company's strategy for 2005-10

Northumbrian Water's overall strategic objective is to ensure that bills rise no more than they have to, whilst safeguarding current high levels of service. The main elements of Northumbrian Water's overall strategy are:

- Appropriate investment in the replacement of worn out assets.
- Investment in improvements to drinking water quality and the environment as required by Government.
- Investment in measures to reduce discoloured water complaints.
- Investment in the alleviation of flooding from sewers.
- Ensuring that demands for water can be met in the future.
- Endeavouring to improve the quality of its services without additional cost to customers.
- Consideration of how it can improve payment options to assist customers to pay their bills.

WaterVoice Northumbria's comments on the draft determination for the Northumbrian area

- The proposed bill increases are more acceptable than the company's proposals, but these assumptions are likely to result in increased regulatory risk and price instability and may compromise levels of service.
- The Committee would prefer a smoother profile over the five-year period, to assist in making bills affordable.
- The strategic and economic mains cleansing programme should be funded, delivered and monitored, consistent with the guidance from Ministers.
- More expenditure is needed to resolve sewer flooding. The £120,000 threshold gives insufficient recognition to the prioritisation programme which the company has developed with input from the Committee.
- Assumption that bad debt will increase only in line with RPI is simplistic and unrealistic.

WaterVoice Eastern's comments on the draft determination for the Essex and Suffolk area

- The proposed combination of reduced expenditure and tough efficiency targets does not represent good value as customers may notice a reduction in the level of service. The current determination should not be viewed in isolation from previous and future determinations.
- Sufficient funding should be included for capital maintenance to at least prevent an increase in bursts and interruptions to supply.

These price limits will enable Northumbrian Water to:

- Continue to maintain a safe, reliable water supply to customers and effective treatment and disposal of sewage.
- Continue to maintain its pipes, sewers and treatment works and to purchase a new ship to transport sewage sludge.
- Meet the demands of new and existing customers for a reliable water supply and sewerage service.
- Install 110,000 optional meters and 38,000 selective meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - renovation of 2,552 km water distribution mains to improve quality at the tap;
  - cleaning of 3,501 km mains to deliver the s19 programme or to improve the acceptability of tap water to customers;
  - four projects to remove pesticides from raw water at water treatment works;
  - nutrient removal works at four sewage treatment works required by the Urban Waste Water Treatment Directive; and
  - work to deal with 497 unsatisfactory intermittent discharges from sewers.
- Resolve or mitigate all known problems identified in the company's plan where overloaded sewers cause flooding inside people's properties.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Northumbrian Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 1.2% (water) and 2.0% (sewerage);
  - capital maintenance efficiency improvements of 3.6% (water) and 3.9% (sewerage);
  - capital enhancement efficiency improvements of 14.8% (water) and 14.6% (sewerage).

Expenditure (£m)	Capital expenditure (net) Five-year total			Operating expenditure Annual average		
	Water	**Sewerage**	**Total**	**Water**	**Sewerage**	**Total**
Base service:				129	72	201
Infrastructure renewals expenditure	97	47	144	—	—	—
Non-infrastructure capital maintenance	179	149	328	—	—	—
Supply/demand balance	66	22	88	1	0	1
Quality enhancements	154	108	262	0	1	1
Enhanced service levels	0	18	18	0	0	0
Total	**496**	**343**	**839**	**130**	**73**	**203**
£ per property per year	54	60	113	70	63	133

Northumbrian area

What is driving the changes in bills? (2004-05 prices)

		Company business plan *			Final determination		
		Water	Sewerage	Total	Water	Sewerage	Total
Average household bill in 2004-05 (£)		**99**	**129**	**228**	**100**	**132**	**232**
Less	(1) past efficiency savings and outperformance	**(3)**	**(4)**	**(7)**	**(1)**	**(3)**	**(4)**
	(2) scope for reduction through future efficiency improvements	**(2)**	**(2)**	**(4)**	**(4)**	**(9)**	**(13)**
Plus	(3) maintaining base services	**20**	**25**	**45**	**8**	**8**	**16**
	of which:						
	a) changes in revenue	3	(4)	(1)	2	(5)	(3)
	b) changes in operating costs	6	7	13	2	6	8
	c) changes in capital maintenance	1	7	8	1	5	6
	d) changes in impact of taxation	8	10	18	2	1	3
	e) financing	2	5	7	1	1	2
	(4) maintaining security of supplies to all customers	**3**	**2**	**5**	**4**	**3**	**7**
	(5) the impact of improvements in drinking water quality	**8**	**–**	**8**	**7**	**–**	**7**
	(6) the impact of environmental improvements	**–**	**11**	**11**	**–**	**13**	**13**
	(7) improvements in service performance	**–**	**1**	**1**	**–**	**2**	**2**
Average household bill in 2009-10		**125**	**162**	**287**	**114**	**146**	**260**

Essex & Suffolk area

What is driving the changes in bills? (2004-05 prices)

		Company business plan*	Final determination
Average household bill in 2004-05 (water) (£)		**127**	**132**
Less	(1) past efficiency savings and outperformance	**(4)**	**(2)**
	(2) scope for reduction through future efficiency improvements	**(3)**	**(7)**
Plus	(3) maintaining base services	**28**	**13**
	of which:		
	a) changes in revenue	4	4
	b) changes in operating costs	9	4
	c) changes in capital maintenance	1	2
	d) changes in impact of taxation	10	2
	e) financing	3	1
	(4) maintaining security of supplies to all customers	**4**	**6**
	(5) the impact of improvements in drinking water quality	**10**	**11**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**162**	**153**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Severn Trent Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**11.8**	**4.8**	**2.0**	**1.7**	**2.3**	**4.5**
Company's business plan		11.0	11.0	2.1	2.1	2.1	5.6
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill (water)	116	126	128	128	130	133	14
Average annual household bill (sewerage)	105	119	124	127	129	132	26
Average annual household bill (total)	**221**	**244**	**252**	**255**	**259**	**265**	**20**
Typical measured bill	200	220	239	247	250	255	27
Typical unmeasured bill	230	257	264	268	274	282	22

Company's strategy for 2005-10

- Maintain the levels of compliance achieved over the last five years against drinking water quality, environmental and customer service standards.
- Protect water resources in the event of prolonged dry weather conditions, by planning on the basis that no more than three hosepipe bans should occur every 100 years, and by achieving a sustainable economic level of leakage of 497 Ml/d by 2010.
- Deliver all new statutory drinking water and environmental improvements.
- Address those service concerns identified by customers as being of the highest priority; in particular improvements in drinking water taste, odour and hardness, resolving sewer flooding problems and improvements to our customer contact systems.
- Provide an attractive investment opportunity by maintaining a strong investment grade credit rating for debt investors and achieving an adequate return to equity investors.

WaterVoice Central's comments on the draft determination

- The Committee understands the need for an increase in bills, which would be supported by many.
- Affordability is a significant problem; the bill increase in 2005 will hit many householders' budgets. Moving expenditure to later years would help. The Government must act to help customers with low and fixed incomes.
- It is important that the allowance for maintenance and service resilience is sufficient to address the backlog of work and keep leakage down.
- Work on providing extra storm water storage at Minworth sewage treatment works is supported, but at a lower cost than the company envisaged.
- The Committee welcomes the drinking water quality improvements.
- A small increase in price limits is warranted to alleviate a greater number of sewer flooding problems and address more quickly the residual blight of properties, gardens and public spaces flooded with sewage.

These price limits will enable Severn Trent Water to:

- Continue to maintain a safe, reliable water supply to customers and effective treatment and disposal of sewage.
- Increase activity to maintain its pipes and sewage treatment works.
- Meet the demands of new and existing customers for a reliable water supply and sewerage service.
- Install 110,000 optional meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - 38 improvements to discharges affecting waters newly designated under the Freshwater Fish Directive;
  - some of the improvements proposed by the company at Minworth sewage treatment works, to further improve the quality of the River Tame;
  - phosphorus removal at 21 sewage treatment works required by the Urban Waste Water Treatment Directive; and
  - 39 improvements at water treatment works including the removal of nitrates.
- Improve pressure of water supply to 19,000 customers by separating shared supply pipes and reduce the hardness of the water supplied from four treatment works affecting 21,000 customers.

- Improve the taste and odour of drinking water from three treatment works.
- Resolve or mitigate all known problems identified in the company's plan where overloaded sewers cause flooding inside people's properties.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Severn Trent Water

- Efficiency improvements assumed 2005-10:
  - annual operating expenditure efficiency improvements of 0.6% (water) and 0.8% (sewerage);
  - capital maintenance efficiency improvements of 5.3% (water) and 5.2% (sewerage);
  - capital enhancement efficiency improvements of 8.5% (water) and 5.1% (sewerage);
- 0.1% added to price limits in recognition of Severn Trent Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total			Operating expenditure Annual average		
	Water	Sewerage	Total	Water	Sewerage	Total
Base service:				197	195	392
Infrastructure renewals expenditure	238	140	378	—	—	—
Non-infrastructure capital maintenance	331	549	880	—	—	—
Supply/demand balance	114	65	179	5	2	7
Quality enhancements	215	474	689	1	11	12
Enhanced service levels	24	50	74	<1	<1	<1
Total	**923**	**1,278**	**2,201**	**204**	**208**	**412**
£ per property per year	56	69	125	62	56	118

What is driving the changes in bills? (2004-05 prices)

		Company business plan *			Final determination		
		Water	Sewerage	Total	Water	Sewerage	Total
Average household bill in 2004-05 (£)		**116**	**105**	**221**	**116**	**105**	**221**
Less	(1) past efficiency savings and outperformance	**–**	**(2)**	**(2)**	**–**	**(2)**	**(2)**
	(2) scope for reduction through future efficiency improvements	**(3)**	**(4)**	**(7)**	**(3)**	**(4)**	**(7)**
Plus	(3) maintaining base services of which:	**15**	**19**	**34**	**9**	**13**	**22**
	a) changes in revenue	(4)	(1)	(5)	(3)	(1)	(4)
	b) changes in operating costs	6	8	14	3	5	8
	c) changes in capital maintenance	6	5	11	3	2	5
	d) changes in impact of taxation	5	5	10	5	6	11
	e) financing	2	2	4	1	1	2
	(4) maintaining security of supplies to all customers	**6**	**3**	**9**	**5**	**2**	**7**
	(5) the impact of improvements in drinking water quality	**7**	**–**	**7**	**5**	**–**	**5**
	(6) the impact of environmental improvements	**–**	**18**	**18**	**–**	**16**	**16**
	(7) improvements in service performance	**2**	**2**	**4**	**1**	**2**	**3**
Average household bill in 2009-10		**143**	**141**	**284**	**133**	**132**	**265**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

South West Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**12.5**	**9.8**	**9.8**	**1.7**	**1.4**	**6.9**
Company's business plan		12.5	9.8	9.8	7.5	3.9	8.7
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill (water)	126	145	159	175	177	179	42
Average annual household bill (sewerage)	231	241	254	269	267	265	15
Average annual household bill (total)	**357**	**386**	**414**	**444**	**445**	**444**	**25**
Typical measured bill	273	310	342	370	373	375	37
Typical unmeasured bill	442	487	534	595	616	636	44

Company's strategy for 2005-10

- Invest in asset maintenance and supply demand to maintain and, where appropriate, improve serviceability.
- Meet the statutory requirements for quality and the environment.
- Improve customer satisfaction with South West Water's services.
- Address customers' expectations over treatment works' odours, foul flooding and discoloured water at minimum cost.
- Provide sufficient network capacity to meet growing demand and the effects of climate change.
- Maintain investor confidence through adequate returns on equity and the continued efficient financing of the business.
- Maintain appropriate headroom within interest covers, taking account of the level of embedded debt and covenants, and lenders' aspirations.
- Achieve challenging but realistic targets for future efficiency on the 80% of operating costs within the company's control.
- Maintain the level of leakage at or below 84 Ml/d, some 10-15 Ml/d below the economic level.

WaterVoice South West's comments on the draft determination

- The level of bill increases will cause affordability problems for many customers, particularly in 2005-06 and 2006-07. Income levels in the South West are significantly below the national average and prices are already substantially higher than in any other region. The Government review of affordability is urgently required.
- WaterVoice feels that Ofwat's presentation of price increases in the company-specific pages of the draft determination was misleading, as it presented average household increases (17%) whereas most customers will pay either the typical measured bill increase (29%) or the typical unmeasured bill increase (35%).
- WaterVoice is concerned that schemes, supported by the quality regulators but excluded from the draft determinations, will be re-introduced through an interim determination of price limits.
- WaterVoice welcomed the reduction in the allowance for funding capital maintenance. Shareholders, not customers, should make good the shortfall where work has not been performed adequately in the first place.
- WaterVoice was not convinced that the sewer flooding cost cap is appropriate. A balance needs to be struck between the cost to customers in general and individual benefits.
- WaterVoice broadly supports Ofwat's metering assumptions, but believes that a full and proper review of the company's tariff structure is urgently required.

These price limits will enable South West Water to:

- Continue to maintain a safe, reliable water supply to customers and effective treatment and disposal of sewage. Increase activity to maintain its pipes, sewers and sewage treatment works.
- Implement new odour control measures at priority sites.
- Meet the demands of new and existing customers for a reliable water supply and sewerage service.
- Install 113,000 optional meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - renovation of more than 3,200 km water distribution mains;

  - improvements at 14 water treatment works to improve quality at the tap;
  - phosphorus removal at 9 sewage treatment works; and
  - work to address 49 unsatisfactory intermittent discharges.
- Resolve or mitigate all known problems identified in the company's plan where overloaded sewers cause flooding inside people's properties.
- Increase price limits in the first three years by the same amount as it proposed in its business plan. We have reprofiled the company's price limits to mitigate the increase in the first year in a similar way to the company did in its business plan. This recognises the company's concerns about the impact on customers of a higher price limit.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for South West Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 2.5% (water) and 2.0% (sewerage);
  - capital maintenance efficiency improvements of 5.0% (water) and 8.7% (sewerage);
  - capital enhancement efficiency improvements of 5.0% (water) and 16.4% (sewerage);
- 0.1% taken from price limits in recognition of South West Water's relatively poorer service.

Expenditure (£m)	Capital expenditure (net) Five-year total			Operating expenditure Annual average		
	Water	Sewerage	Total	Water	Sewerage	Total
Base service:				55	52	108
Infrastructure renewals expenditure	58	37	95	—	—	—
Non-infrastructure capital maintenance	99	118	217	—	—	—
Supply/demand balance	59	51	110	1	1	2
Quality enhancements	269	60	329	1	2	3
Enhanced service levels	0	11	11	0	0	0
Total	**485**	**277**	**762**	**58**	**54**	**112**
£ per property per year	131	84	216	78	83	161

What is driving the changes in bills? (2004-05 prices)

		Company business plan *			Final determination		
		Water	Sewerage	Total	Water	Sewerage	Total
Average household bill in 2004-05 (£)		**126**	**230**	**356**	**126**	**231**	**357**
Less	(1) past efficiency savings and outperformance	**(1)**	**(5)**	**(6)**	**1**	**(1)**	**–**
	(2) scope for reduction through future efficiency improvements	**(5)**	**(6)**	**(11)**	**(13)**	**(15)**	**(28)**
Plus	(3) maintaining base services of which:	**37**	**37**	**74**	**30**	**21**	**51**
	a) changes in revenue	3	1	4	4	3	7
	b) changes in operating costs	14	14	28	13	14	27
	c) changes in capital maintenance	10	9	19	7	–	7
	d) changes in impact of taxation	7	5	12	4	1	5
	e) financing	3	8	11	2	3	5
	(4) maintaining security of supplies to all customers	**8**	**8**	**16**	**8**	**10**	**18**
	(5) the impact of improvements in drinking water quality	**22**	**–**	**22**	**27**	**–**	**27**
	(6) the impact of environmental improvements	**–**	**23**	**23**	**–**	**17**	**17**
	(7) improvements in service performance	–	**2**	**2**	**–**	**2**	**2**
Average household bill in 2009-10		**187**	**289**	**476**	**179**	**265**	**444**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Southern Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**12.6**	**3.9**	**3.5**	**5.8**	**2.6**	**5.6**
Company's business plan		17.0	5.6	5.6	5.5	5.5	7.7
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill (water)	91	109	109	109	110	110	21
Average annual household bill (sewerage)	168	182	188	196	209	214	27
Average annual household bill (total)	**259**	**290**	**298**	**305**	**319**	**324**	**25**
Typical measured bill	239	272	285	293	305	311	30
Typical unmeasured bill	271	306	315	326	346	356	31

Company's strategy for 2005-10

- Address the most urgent asset maintenance performance issues, as a priority, to deliver a stable, reliable sustainable service to customers, meet regulators' expectations and comply with their formal consents.
- Target water infrastructure, where the company's holistic analysis of performance has shown a need to invest in hotspots of problems on leakage, pressure, bursts, taste and odour. Improve sewerage infrastructure performance to reduce flooding, pollution incidents and blockage risks.
- Deliver the environmental improvement programme required and ensure a high-quality secure supply of drinking water to one of the driest areas in the country.
- Start to address the strategic water and wastewater infrastructure required to facilitate the major housing growth that is now being implemented in the South East by the Government (eg Ashford). Ensure that 2005-10 is a platform for this ongoing growth.
- Maximise future efficiency of operating costs and capital scheme delivery that can be sustained without adversely affecting customer service. Ensure that the long-term financial stability of the company enables it to deliver all of its investment obligations efficiently.

WaterVoice Southern's comments on the draft determination

- The bill increase in the first year for customers who receive both water and sewerage services from Southern Water is significant. Moving expenditure to later years, where possible, could reduce this initial increase.
- The Committee is very disappointed both with the overall amount of money allocated to sewer flooding and with the cost cap. It believes that the most serious problems should be dealt with as a priority. It is concerned that a number of serious problems, often of repeated flooding, will not now be tackled.
- Security of supply is a major issue for the region and strategies are needed to improve network connections and increase storage capacity. Developers should contribute fully to the costs of reinforcing or extending the networks to meet new demand.
- Blending water is a less expensive solution for dealing with nitrates than filtration and WaterVoice supports such schemes.

These price limits will enable Southern Water to:

- Continue to maintain a safe, reliable water supply to customers and effective treatment and disposal of sewage.
- Increase activity to improve performance for the sewage treatment works and sludge disposal assets. Continue to maintain its pipes, sewers and water treatment works.
- Meet the demands of new and existing customers for a reliable water supply and sewerage service. This includes upgrading two water treatment works, improving the network to move water to areas of greater demand, making network improvements and increasing capacity.
- Invest in the sewerage system to meet increased demand from 80,000 new properties in the region in 2005-10.
- Improve the security of supply index to 100 by 2008-09.
- Install 50,000 optional meters and 63,000 selective meters by 2009-10.
- Deliver required drinking water and environmental quality standards, including:
  - work at eight water treatment works to improve quality at the tap;
  - blending as well as treatment at three sites to reduce nitrate levels in tap water;

  - nutrient removal at 20 sewage treatment works to protect sites of special scientific interest;
  - the provision of secondary biological sewage treatment for Brighton & Hove and Margate & Broadstairs; and
  - work to address 42 unsatisfactory intermittent discharges.
- Resolve or mitigate all known problems identified in the company's plan where overloaded sewers cause flooding inside people's properties. Make improvements at Eastney pumping station.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Southern Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 0.6% (water) and 1.4% (sewerage);
  - capital maintenance efficiency improvements of 8.9% (water) and 10.0% (sewerage);
  - capital enhancement efficiency improvements of 14.7% (water) and 9.3% (sewerage).

Expenditure (£m)	Capital expenditure (net) Five-year total			Operating expenditure Annual average		
	Water	Sewerage	Total	Water	Sewerage	Total
Base service:				60	108	168
Infrastructure renewals expenditure	97	73	170	—	—	—
Non-infrastructure capital maintenance	102	449	551	—	—	—
Supply/demand balance	55	57	112	1	<1	2
Quality enhancements	14	629	643	0	5	5
Enhanced service levels	0	86	87	0	0	0
Total	**268**	**1,294**	**1,563**	**62**	**113**	**175**
£ per property per year	52	143	195	60	62	123

What is driving the changes in bills? (2004-05 prices)

		Company business plan *			Final determination		
		Water	Sewerage	Total	Water	Sewerage	Total
Average household bill in 2004-05 (£)		**90**	**169**	**259**	**91**	**168**	**259**
Less	(1) past efficiency savings and outperformance	**(1)**	**(3)**	**(4)**	**–**	**–**	**–**
	(2) scope for reduction through future efficiency improvements	**(1)**	**(2)**	**(3)**	**(6)**	**(11)**	**(17)**
Plus	(3) maintaining base services of which:	**24**	**23**	**47**	**12**	**14**	**26**
	a) changes in revenue	(8)	(3)	(11)	(10)	(3)	(13)
	b) changes in operating costs	8	10	18	1	6	7
	c) changes in capital maintenance	21	13	34	21	14	35
	d) changes in impact of taxation	2	1	3	(1)	(4)	(5)
	e) financing	1	2	3	1	1	2
	(4) maintaining security of supplies to all customers	**8**	**3**	**11**	**10**	**2**	**12**
	(5) the impact of improvements in drinking water quality	**3**	**–**	**3**	**3**	**–**	**3**
	(6) the impact of environmental improvements	**–**	**42**	**42**	**–**	**38**	**38**
	(7) improvements in service performance	**–**	**4**	**4**	**–**	**3**	**3**
Average household bill in 2009-10		**123**	**236**	**359**	**110**	**214**	**324**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Thames Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**14.9**	**2.1**	**1.2**	**1.3**	**1.5**	**4.1**
Company's business plan		22.1	5.5	2.8	2.0	2.2	6.7
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill (water)	113	146	151	154	155	156	39
Average annual household bill (sewerage)	98	100	101	101	102	104	7
Average annual household bill (total)	**210**	**246**	**252**	**255**	**258**	**261**	**24**
Typical measured bill	196	226	231	234	236	239	22
Typical unmeasured bill	215	252	260	263	267	270	26

Company's strategy for 2005-10

Thames Water's proposals are directed at customers' priorities for service and reliability of supply, the longer term needs of the company's infrastructure, catering for significant projected population growth and climate change. The strategy also delivers the quality and environmental improvements supported by Government.

Thames Water proposed to invest during the next five years to:

- Address the critical issues of leakage, supply demand balance and reduce the nuisance from odour and sewer flooding.
- Increase the availability of water resources and treatment capacity for water and wastewater so that continuity of service is maintained in future years.
- Carry out vital maintenance and replacement of key assets that are in a condition to present a risk to maintaining service levels.
- Implement specific, legally required quality and environmental improvements, or those where the benefit has been clearly demonstrated to be appropriate to the cost by the quality regulators.

WaterVoice Thames's comments on the draft determination

- While in principle customers prefer steady price changes, the extra cost of smoothing the increases over 2005-10 makes this approach unattractive.
- The sewer flooding programme should be increased by £150 million. The most severe problems should be prioritised. Properties should not be excluded solely on the grounds of cost.
- More action is needed to ensure security of supply in the medium to longer term. The proposed desalination plant at Beckton is supported and detailed planning for a new reservoir in Oxfordshire should start before 2010.
- The Tideway scheme should be properly costed provided the 27-mile interceptor tunnel is confirmed as the preferred solution.
- There is concern that the cuts in the company's forecast costs of repairing and replacing mains and local supply pipes could lead to an increase in bursts and supply interruptions.

These price limits will enable Thames Water to:

- Continue to maintain a safe, reliable water supply to customers and effective treatment and disposal of sewage.
- Increase activity to maintain its pipes and sewers, including the renewal of about 1,400 km of water distribution mains.
- Meet the demands of new and existing customers for a reliable water supply and sewerage service.
- Progress improvements to security of supply by developing desalination at Beckton, and detailed planning for a new reservoir in Oxfordshire.
- Deliver the 'agreed steps programme' on security of supply, including leakage, and work on 148 local networks in London.
- Install 63,000 optional meters and 49,000 selective meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - eight projects to reduce nitrates and the risk of Cryptosporidium in drinking water;
  - starting projects to increase the capacity of the four large London sewage treatment

works; and
  - interim measures and further investigations to deal with the environmental impact of storm water discharges into the Thames Tideway.
- Implement a phased approach to the reduction of odour from Mogden sewage treatment works.
- Resolve or mitigate all known problems identified in the company's plan where overloaded sewers cause flooding inside people's properties. Reduce sewer flooding due to repeated blockages at 3,700 properties.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Thames Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 2.5% (water) and 0.5% (sewerage);
  - capital maintenance efficiency improvements of 2.7% (water) and 5.4% (sewerage);
  - capital enhancement efficiency improvements of 10.5% (water) and 14.9% (sewerage).

Expenditure (£m)	Capital expenditure (net) Five-year total			Operating expenditure Annual average		
	Water	Sewerage	Total	Water	Sewerage	Total
Base service:				264	223	487
Infrastructure renewals expenditure	279	184	463	—	—	—
Non-infrastructure capital maintenance	344	525	869	—	—	—
Supply/demand balance	869	215	1,084	5	1	5
Quality enhancements	234	230	465	2	4	6
Enhanced service levels	0	212	212	0	0	0
Total	**1,726**	**1,366**	**3,092**	**271**	**228**	**498**
£ per property per year	99	51	150	78	42	120

What is driving the changes in bills? (2004-05 prices)

		Company business plan *			Final determination		
		Water	Sewerage	Total	Water	Sewerage	Total
Average household bill in 2004-05 (£)		**114**	**97**	**211**	**113**	**98**	**210**
Less	(1) past efficiency savings and outperformance	**(4)**	**(7)**	**(11)**	**–**	**(1)**	**(1)**
	(2) scope for reduction through future efficiency improvements	**–**	**–**	**–**	**(10)**	**(6)**	**(16)**
Plus	(3) maintaining base services	**40**	**9**	**49**	**23**	**(8)**	**16**
	of which:						
	a) changes in revenue	(8)	(5)	(13)	(6)	(8)	(14)
	b) changes in operating costs	31	7	38	15	–	15
	c) changes in capital maintenance	9	3	12	10	(1)	10
	d) changes in impact of taxation	5	2	7	3	–	3
	e) financing	3	2	5	1	1	2
	(4) maintaining security of supplies to all customers	**24**	**5**	**29**	**22**	**7**	**30**
	(5) the impact of improvements in drinking water quality	**4**	**–**	**4**	**8**	**–**	**8**
	(6) the impact of environmental improvements	**–**	**6**	**6**	**–**	**11**	**11**
	(7) improvements in service performance	**2**	**4**	**6**	**–**	**3**	**3**
Average household bill in 2009-10		**180**	**114**	**294**	**156**	**104**	**261**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

United Utilities Water

Price limits (%)	2004-05[1]	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**5.0**	**6.4**	**4.4**	**3.5**	**3.0**	**4.5**
Company's business plan		10.7	11.7	8.5	5.1	3.3	7.8
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill (water)	133	131	137	141	144	147	10
Average annual household bill (sewerage)	136	146	158	165	170	175	29
Average annual household bill (total)	**269**	**277**	**295**	**306**	**314**	**322**	**20**
Typical measured bill	246	259	282	292	299	305	24
Typical unmeasured bill	279	289	309	324	337	349	25

1 United Utilities Water was allowed an increase in its price limit to 8.9% from 4.5% in 2004-05 following an interim review. This has reduced the price limit that the company would otherwise have been allowed in 2005-06.

Company's strategy for 2005-10

United Utilities Water's overall strategy reflects its customers' needs and the desire of the public, Government and the regulators to see a water industry characterised by sustainable, efficient and securely financed companies. United Utilities Water's key strategic objectives are:

- Continue to deliver a value for money package of services to its customers, retaining the current high level of customer satisfaction.
- Maintain, and in some cases, improve the current performance of assets at an acceptable level of risk, to deliver existing service levels.
- Maintain the supply demand balance and security of supply to all customers.
- Deliver enhancements to environmental and drinking water quality required by Government and the regulators.
- Continue to make significant inroads into the problem of sewer flooding at customer premises, and begin a programme of work to tackle the most serious instances of external flooding.
- Address the problem of odour at wastewater treatment works where this has given rise to the most significant customer and community concerns.
- Continue to deliver innovation and efficiency in operations.
- Ensure investor confidence is maintained by delivering acceptable returns to investors through an efficient and sustainable capital structure.

WaterVoice North West's comments on the draft determination

- The proposed price limits are more acceptable than the company's proposals, but they may still cause affordability problems for customers.
- More expenditure should be allowed for resolving sewer flooding problems. The most serious problems should be dealt with as a priority and properties should not be excluded because solutions are expensive. The proposed cost cap is incompatible with this approach.
- The company should be funded adequately to reduce odours from sewage treatment works where this is genuinely a cost which should fall to customers.
- WaterVoice North West has concerns about the level of uncertainty regarding the scale of the environmental programme and the potential for an interim determination.

These price limits will enable United Utilities Water to:

- Continue to maintain a safe, reliable water supply to customers and effective treatment and disposal of sewage.
- Increase activity to maintain its pipes, sewers and treatment works, including changes to the treatment and disposal of sewage sludge.
- Resolve the problem of odour at three designated sewage treatment works and other sites regarded as high priority by the company.
- Meet the demands of new and existing customers for a reliable water supply and sewerage service.
- Install over 200,000 optional meters and nearly 1,000 selective meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - six phosphorus removal works to comply with the requirements of the Urban Waste Water Treatment Directive;
  - improvements at 30 sites discharging to waters newly designated under the Freshwater

Fish Directive;
  - investigations into the potential impact of changes to land management practices in two upland areas (including Dark Peak and Bowland Fells) on the condition of sites of special scientific interest in these uplands and the quality of the rivers draining them;
  - renovation of 2,555 km water distribution mains and cleaning 153 km of trunk mains to improve quality at the tap; and
  - reducing the risk from Cryptosporidium at 21 sites.
- Resolve or mitigate all known problems identified in the company's plan where overloaded sewers cause flooding inside people's properties.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for United Utilities Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 1.2% (water) and 2.0% (sewerage);
  - capital maintenance efficiency improvements of 7.0% (water) and 7.3% (sewerage);
  - capital enhancement efficiency improvements of 10.8% (water) and 12.0% (sewerage);
- 0.1% taken from price limits in recognition of United Utilities Water's relatively poorer service.

Expenditure (£m)	**Capital expenditure (net) Five-year total**			**Operating expenditure Annual average**		
	Water	**Sewerage**	**Total**	**Water**	**Sewerage**	**Total**
Base service:				189	181	370
Infrastructure renewals expenditure	275	225	500	—	—	—
Non-infrastructure capital maintenance	299	475	774	—	—	—
Supply/demand balance	51	79	129	2	2	4
Quality enhancements	409	633	1,042	9	17	25
Enhanced service levels	0	60	60	0	0	0
Total	**1,034**	**1,471**	**2,505**	**200**	**199**	**399**
£ per property per year	69	100	170	67	68	135

What is driving the changes in bills? (2004-05 prices)

		Company business plan *			**Final determination**		
		Water	**Sewerage**	**Total**	**Water**	**Sewerage**	**Total**
Average household bill in 2004-05 (£)		**133**	**136**	**269**	**133**	**136**	**269**
Less	(1) past efficiency savings and outperformance	**–**	**–**	**–**	**–**	**(1)**	**(1)**
	(2) scope for reduction through future efficiency improvements	**(4)**	**(3)**	**(7)**	**(7)**	**(8)**	**(15)**
Plus	(3) maintaining base services of which:	**7**	**12**	**19**	**1**	**8**	**9**
	a) changes in revenue	(3)	(13)	(16)	–	(12)	(12)
	b) changes in operating costs	3	15	18	(2)	10	8
	c) changes in capital maintenance	1	3	4	(3)	1	(2)
	d) changes in impact of taxation	4	4	8	5	7	12
	e) financing	2	3	5	1	2	3
	(4) maintaining security of supplies to all customers	**5**	**5**	**10**	**2**	**3**	**5**
	(5) the impact of improvements in drinking water quality	**30**	**–**	**30**	**18**	**–**	**18**
	(6) the impact of environmental improvements	**–**	**46**	**46**	**–**	**34**	**34**
	(7) improvements in service performance	**–**	**3**	**3**	**–**	**3**	**3**
Average household bill in 2009-10		**171**	**199**	**370**	**147**	**175**	**322**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Wessex Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**8.9**	**4.9**	**5.6**	**4.0**	**2.9**	**5.2**
Company's business plan		12.0	12.0	7.0	1.0	1.0	6.5
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill (water)	126	144	152	162	168	170	35
Average annual household bill (sewerage)	151	157	161	167	172	177	18
Average annual household bill (total)	**276**	**301**	**313**	**329**	**340**	**347**	**25**
Typical measured bill	227	248	264	278	287	292	29
Typical unmeasured bill	302	335	350	374	393	407	35

Company's strategy for 2005-10

- The company strategy was reflected in its draft business plan. This was to maintain the base business, provide a reasonable return to investors and carry out quality and environmental improvements that offer maximum benefits and could be funded within price limits of RPI + 2% per year.
- The final business plan reflects government guidance, requiring faster implementation of environmental improvements than proposed by the company.
- This does not reflect the views of customers and loses the sustainable balance that the company had sought to achieve between all stakeholders. The final business plan represents what is necessary to meet the requirements of Ministers.

WaterVoice Wessex's comments on the draft determination

- The level of bill increases is unacceptable, as it is more than customers indicated they were prepared to pay in customer research.
- The need for nitrate removal plants should be reviewed. Blending water from different sources may provide good quality drinking water at a lower cost.
- The funding of sewer flooding work should be reviewed to ensure that problems are resolved in 2005-10 for those properties that suffer most incidences.
- The increase in maintenance levels from current levels is supported.

These price limits will enable Wessex Water to:

- Continue to maintain a safe, reliable water supply to customers and effective treatment and disposal of sewage.
- Increase activity to maintain its pipes, sewers and treatment works.
- Meet the demands of new and existing customers for a reliable water supply and sewerage service.
- Install 46,000 optional meters and 2,000 selective meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - nine projects to treat and blend water sources to reduce nitrate levels in tap water;
  - phosphorus removal from 18 sewage effluents to protect Special Areas of Conservation;
  - connecting 800 properties to the public sewerage system; and
  - work to deal with some low flow rivers.
- Resolve or mitigate all known problems identified in the company's plan where overloaded sewers cause flooding inside people's properties.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Wessex Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 0.3% (water) and 0.5% (sewerage);
  - capital maintenance efficiency improvements of 6.3% (water) and 2.9% (sewerage);
  - capital enhancement efficiency improvements of 3.7% (water) and 6.5% (sewerage);
- 0.1% added to price limits in recognition of Wessex Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total			Operating expenditure Annual average		
	Water	Sewerage	Total	Water	Sewerage	Total
Base service:				37	60	97
Infrastructure renewals expenditure	51	47	98	—	—	—
Non-infrastructure capital maintenance	88	146	234	—	—	—
Supply/demand balance	38	30	68	1	1	2
Quality enhancements	101	198	298	2	7	9
Enhanced service levels	0	57	57	0	0	0
Total	**278**	**478**	**755**	**40**	**68**	**108**
£ per property per year	103	87	190	73	63	136

What is driving the changes in bills? (2004-05 prices)

		Company business plan *			Final determination		
		Water	Sewerage	Total	Water	Sewerage	Total
Average household bill in 2004-05 (£)		**126**	**150**	**276**	**126**	**151**	**276**
Less	(1) past efficiency savings and outperformance	**(7)**	**(10)**	**(17)**	**(5)**	**(7)**	**(12)**
	(2) scope for reduction through future efficiency improvements	**(7)**	**(6)**	**(13)**	**(4)**	**(5)**	**(8)**
Plus	(3) maintaining base services	**35**	**14**	**49**	**23**	**4**	**27**
	of which:						
	a) changes in revenue	8	6	14	6	3	9
	b) changes in operating costs	10	7	17	7	4	11
	c) changes in capital maintenance	8	(6)	2	7	(4)	3
	d) changes in impact of taxation	7	5	12	2	–	2
	e) financing	2	2	4	1	1	2
	(4) maintaining security of supplies to all customers	**5**	**4**	**9**	**6**	**3**	**9**
	(5) the impact of improvements in drinking water quality	**26**	**–**	**26**	**24**	**–**	**24**
	(6) the impact of environmental improvements	**–**	**29**	**29**	**–**	**26**	**26**
	(7) improvements in service performance	**–**	**4**	**4**	**–**	**5**	**5**
Average household bill in 2009-10		**178**	**185**	**363**	**170**	**177**	**347**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Yorkshire Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**5.5**	**4.9**	**3.6**	**3.6**	**2.1**	**3.9**
Company's business plan		6.9	3.7	3.7	3.7	3.7	4.3
Expected effect on household bills of draft determination (£)							**% change**
Average annual household bill (water)	117	122	127	130	133	133	14
Average annual household bill (sewerage)	126	133	138	144	150	155	22
Average annual household bill (total)	**243**	**254**	**265**	**274**	**283**	**288**	**18**
Typical measured bill	205	217	229	236	243	247	21
Typical unmeasured bill	259	272	285	297	311	319	24

Company's strategy for 2005-10

Yorkshire Water's strategy aims to keep prices as low as possible whilst ensuring an operationally and financially sustainable business. Yorkshire Water's overall strategy will allow them to:

- Maintain asset serviceability and services to customers.
- Improve drinking water and environmental quality, including:
  - rehabilitation of the water distribution network;
  - protecting the quality of drinking water;
  - delivering compliance with the Freshwater Fish Directive; and
  - reducing the number of unsatisfactory intermittent discharges.
- Reduce flooding from sewers.
- Maintain reliability of water supplies and capacity of sewerage services.

WaterVoice Yorkshire's comments on the draft determination

- Price increases above the rate of inflation raise concerns about affordability, especially for customers on low or fixed incomes.
- Increases in price limits should be smoothed over the five years.
- Re-balancing prices between measured and unmeasured customers should be phased over five years rather than two.
- A cost-benefit approach to solving sewer flooding problems based on frequency and severity is more beneficial to customers than a financial cut-off point. The most serious problems should not be excluded on costs alone.
- Drinking water quality schemes supported by the DWI for discolouration and pH treatment should be included in the final determination.

These price limits will enable Yorkshire Water to:

- Continue to maintain a safe, reliable water supply to customers and effective treatment and disposal of sewage.
- Increase activity to maintain its sewage treatment works.
- Meet the demands of new and existing customers for a reliable water supply and sewerage service.
- Install 114,000 optional meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - work at 22 water treatment works;
  - renovation of 2,066 km distribution mains and clean another 1,215 km, to improve quality at the tap including some work to address consumer acceptability;
  - projects to deal with 564 unsatisfactory intermittent discharges; and
  - 33 improvements to discharges affecting waters newly designated under the Freshwater Fish Directive.
- Resolve or mitigate all known problems identified in the company's plan where overloaded sewers cause flooding inside people's properties.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Yorkshire Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 0.6% (water) and 0.5% (sewerage);
  - capital maintenance efficiency improvements of 2.0% (water) and 3.7% (sewerage);
  - capital enhancement efficiency improvements of 4.7% (water) and 11.3% (sewerage);
- 0.1% added to price limits in recognition of Yorkshire Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total			Operating expenditure Annual average		
	Water	Sewerage	Total	Water	Sewerage	Total
Base service:				122	105	227
Infrastructure renewals expenditure	147	70	217	—	—	—
Non-infrastructure capital maintenance	205	269	474	—	—	—
Supply/demand balance	20	40	60	1	1	2
Quality enhancements	248	438	686	2	6	8
Enhanced service levels	0	16	16	0	0	0
Total	**619**	**834**	**1,453**	**125**	**112**	**237**
£ per property per year	60	81	141	61	54	115

What is driving the changes in bills? (2004-05 prices)

		Company business plan *			Final determination		
		Water	Sewerage	Total	Water	Sewerage	Total
Average household bill in 2004-05 (£)		**117**	**126**	**243**	**117**	**126**	**243**
Less	(1) past efficiency savings and outperformance	**(6)**	**(8)**	**(14)**	**(6)**	**(7)**	**(13)**
	(2) scope for reduction through future efficiency improvements	**(1)**	**(1)**	**(2)**	**(3)**	**(4)**	**(7)**
Plus	(3) maintaining base services	**12**	**11**	**23**	**9**	**7**	**16**
	of which:						
	a) changes in revenue	(6)	(6)	(12)	(7)	(5)	(12)
	b) changes in operating costs	6	4	10	4	2	6
	c) changes in capital maintenance	1	–	1	1	(2)	(1)
	d) changes in impact of taxation	9	11	20	9	10	19
	e) financing	2	2	4	2	2	4
	(4) maintaining security of supplies to all customers	**2**	**2**	**4**	**2**	**2**	**4**
	(5) the impact of improvements in drinking water quality	**11**	**–**	**11**	**14**	**–**	**14**
	(6) the impact of environmental improvements	**–**	**27**	**27**	**–**	**29**	**29**
	(7) improvements in service performance	**–**	**1**	**1**	**–**	**2**	**2**
Average household bill in 2009-10		**135**	**158**	**293**	**133**	**155**	**288**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Bournemouth & West Hampshire Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**15.9**	**2.2**	**1.6**	**-0.6**	**-2.4**	**3.1**
Company's business plan		15.9	3.0	0.0	0.0	-2.0	3.2
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	107	123	125	126	125	122	14
Typical measured bill	90	102	104	105	104	101	12
Typical unmeasured bill	117	136	139	143	145	143	23

Company's strategy for 2005-10

The company's strategic objectives for AMP4 are:

- To continue to meet its legal, statutory and environmental obligations as a water supply company.
- To deliver drinking water to its customers that meets the appropriate and relevant quality standards.
- To ensure a reliable and continuous supply of water.
- To maintain, develop and improve its asset base.
- To maintain, and improve where appropriate, the standards of service it provides for its customers.
- To achieve ongoing efficiencies in its costs of operation and investment.
- To provide a sufficient rate of return to its shareholders.

In support of these objectives, the key targets of the company's AMP4 plan are:

- To increase the focus on infrastructure asset maintenance.
- To continue with its commitment to metering households on change of occupier, provided that the regulatory provisions to do so are acceptable.
- To carry out a fair investigation into the impact of its abstractions on the designated Lower Avon wildlife habitats, while raising the profile of this issue, and to ensure that its customers are not disadvantaged by the outcome.
- To achieve ongoing improvements in efficiency without compromising its ability to provide the services it is obliged to provide to its customers.

WaterVoice Wessex's comments on the draft determination

- The level of bill increases over five years is acceptable.
- The increase in the first year may cause affordability problems for customers. Smoothing the increase over two years would be preferable, so long as this did not significantly increase bills over the five years.
- If investigations show work to be essential, then WaterVoice Wessex supports expenditure on an automatic sluice gate at Knapp Mill.

These price limits will enable Bournemouth & West Hampshire Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes.
- Meet the demands of new and existing customers for a reliable water supply.
- Install over 9,000 optional meters and just under 18,000 selective meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - a project to assess options for the sluice at Knapp Mill water treatment works;
  - improve the taste and odour of the water supplied to all customers.
- Work to maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.
- Increase price limits in 2005-06 by the same amount as it proposed in its business plan. We have reprofiled the company's price limits to mitigate the increases in the first year.

Efficiency and incentives in setting price limits for Bournemouth & West Hampshire Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 0.6%;
  - capital maintenance efficiency improvements of 3.8%;
  - capital enhancement efficiency improvements of 13.4%;
- 0.1% added to price limits in recognition of Bournemouth & West Hampshire Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		13.9
Infrastructure renewals expenditure	7.4	–
Non-infrastructure capital maintenance	21.9	–
Supply/demand balance	12.1	0.3
Quality enhancements	1.2	0.0
Enhanced service levels	0.3	0.0
Total	**42.8**	**14.2**
£ per property per year	45	75

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**107**	**107**
Less	(1) past efficiency savings and outperformance	**(5)**	**(2)**
	(2) scope for reduction through future efficiency improvements	**(1)**	**(4)**
Plus	(3) maintaining base services	**12**	**13**
	of which:		
	a) changes in revenue	3	1
	b) changes in operating costs	7	6
	c) changes in capital maintenance	–	–
	d) changes in impact of taxation	3	5
	e) financing	(1)	1
	(4) maintaining security of supplies to all customers	**5**	**7**
	(5) the impact of improvements in drinking water quality	**1**	**1**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**1**	–
Average household bill in 2009-10		**120**	**122**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Bristol Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**13.8**	**2.8**	**1.5**	**0.7**	**-2.3**	**3.2**
Company's business plan		20.0	6.0	6.0	0.0	0.0	6.2
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	108	121	123	124	125	122	13
Typical measured bill	92	105	111	113	114	112	21
Typical unmeasured bill	113	127	128	131	132	129	15

Company's strategy for 2005-10

- To keep bills as low as possible, while meeting the company's obligations and customer requirements. The company has removed or deferred some investment and has accepted a higher level of risk than it would prefer to minimise the impact on bills during the period. The proposed investment programme reflects customer requirements for a secure and reliable supply of water with four schemes to provide a better level of security of mains water supply to large numbers of customers.
- To continue to deliver high-quality service to customers, as reflected in Ofwat's annual performance review and water quality measures.
- To take an integrated view of the company's investment programme, continuing operating and financing costs, returns on capital and risk profile. Increasing the risk profile would change this balance.

WaterVoice Wessex's comments on the draft determination

- The level of the bill increases taken over five years is generally good value for money. However the Committee questions some schemes that Ofwat has allowed.
- The increase in the first year may cause affordability problems. Phasing large capital programmes to the later years may help.
- Re-balancing prices between measured and unmeasured customers should be phased over more than two years, to reduce the very large increases for measured customers in 2005.
- The proposal for the River Axe is not supported and there are still doubts about whether the Blagdon scheme is warranted for supply/demand reasons.
- Of the schemes proposed to increase security of supply, WaterVoice Wessex only supports the northern scheme.

These price limits will enable Bristol Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes and treatment works.
- Meet the demands of new and existing customers for a reliable water supply.
- Install 18,500 optional meters and 2,000 selective meters by 2009-10.
- Deliver required drinking water quality improvements, including:
  - the northern scheme to secure water supplies to customers in the event of a supply failure from the company's largest source; and
  - three projects to deal with deteriorating raw water quality.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.
- Reduce by 96 the number of properties at risk of low water pressure.

Efficiency and incentives in setting price limits for Bristol Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 2.5%;
  - capital maintenance efficiency improvements of 8.8%;
  - capital enhancement efficiency improvements of 19.9%;
- 0.2% added to price limits in recognition of Bristol Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		34.6
Infrastructure renewals expenditure	41.3	–
Non-infrastructure capital maintenance	40.0	–
Supply/demand balance	3.8	0.4
Quality enhancements	31.8	1.2
Enhanced service levels	0.1	0.0
Total	**117.0**	**36.2**
£ per property per year	48	73

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**108**	**108**
Less	(1) past efficiency savings and outperformance	**(4)**	**1**
	(2) scope for reduction through future efficiency improvements	**(4)**	**(11)**
Plus	(3) maintaining base services	**27**	**13**
	of which:		
	a) changes in revenue	(7)	(5)
	b) changes in operating costs	14	6
	c) changes in capital maintenance	14	11
	d) changes in impact of taxation	5	1
	e) financing	1	–
	(4) maintaining security of supplies to all customers	**9**	**7**
	(5) the impact of improvements in drinking water quality	**6**	**4**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**142**	**122**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Cambridge Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**11.8**	**1.6**	**0.3**	**-0.8**	**-0.3**	**2.4**
Company's business plan		17.3	3.1	1.1	0.6	0.2	4.3
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	91	100	101	102	101	101	11
Typical measured bill	82	90	92	92	92	91	11
Typical unmeasured bill	101	113	114	115	114	114	14

Company's strategy for 2005-10

- Maintain the current high levels of service for customers.
- Increase capital maintenance to maintain stable serviceability of the network, as measured by interruptions to supply, bursts and leakage.
- Reduce the risk of water quality and water supply failures.
- Ensure the company can continue to finance its functions by providing appropriate returns to lenders and shareholders.

WaterVoice Eastern's comments on the draft determination

- The proposed combination of reduced expenditure and tough efficiency targets does not represent good value as customers may notice a reduction in the level of service. The current determination should not be viewed in isolation from previous and future determinations.
- Bill increases should be smoothed over the five years, eliminating any negative price limits.
- Meter installation rates should be increased, as metering assists the supply/demand balance and gives customers an element of control over their bills.
- The predicted population increase will put a strain on the existing water resources and a greater allowance should be made for this.
- Sufficient funding should be included for capital maintenance to at least prevent an increase in bursts and interruptions to supply.

These price limits will enable Cambridge Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes and treatment works to ensure that service is maintained.
- Meet the demands of new and existing customers for a reliable water supply.
- Install 4,300 optional meters and 75 selective meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - a project to blend water sources to reduce nitrate levels in tap water; and
  - three investigations into the impact of water abstractions on the environment.
- Remove 41 properties from the risk of low pressure at the tap.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Cambridge Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 0.6%;
  - capital maintenance efficiency improvements of 8.0%;
  - capital enhancement efficiency improvements of 27.1%;
- 0.2% added to price limits in recognition of Cambridge Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		8.6
Infrastructure renewals expenditure	7.9	–
Non-infrastructure capital maintenance	4.8	–
Supply/demand balance	2.7	0.1
Quality enhancements	1.6	0.3
Enhanced service levels	0.0	0.0
Total	**17.0**	**8.9**
£ per property per year	27	72

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**91**	**91**
Less	(1) past efficiency savings and outperformance	**1**	**1**
	(2) scope for reduction through future efficiency improvements	**–**	**(5)**
Plus	(3) maintaining base services	**11**	**8**
	of which:		
	a) changes in revenue	(7)	(8)
	b) changes in operating costs	6	6
	c) changes in capital maintenance	8	6
	d) changes in impact of taxation	4	3
	e) financing	–	1
	(4) maintaining security of supplies to all customers	**3**	**3**
	(5) the impact of improvements in drinking water quality	**3**	**3**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**109**	**101**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Cholderton Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination[1]		**7.0**	**7.0**	**5.6**	**0.0**	**0.1**	**3.9**
Company's business plan		15.0	12.0	2.0	1.0	1.0	6.0
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill [2]	136	146	157	166	166	167	23

1 We have re-profiled the company's price limits to mitigate the increases in the first two years.
2 The average bill for 2004-05 has been amended because the company's largest customer has been re-allocated from household to non-household revenue.

Company's strategy for 2005-10

- Improve monitoring of abstraction, water supplied and leakage. Consider the most effective solutions for dealing with future supply and demand. Develop proposals for any increase in abstraction after 2010.
- Continue to provide safe, reliable drinking water meeting the highest quality standards. Replace old iron mains to deal with isolated failures and investigate options to deal with problems of rising nitrates.
- Preserve existing customer service standards, responding rapidly and effectively to customer needs.
- Increase the rate of mains renewal to support leakage control.
- Help to preserve and enhance the overall quality of life in the local community by safeguarding vulnerable customers.
- Protect the environment by encouraging water conservation.

WaterVoice Wessex's comments on the draft determination

- The increase in bills over five years is acceptable.
- The Committee questions the price profile, and the need for a large year one increase.
- Customer services could be improved by funding a further part-time administrative member of staff.
- The Committee would like the company to include a strategy to install selective meters on change of occupier in the charges scheme.

These price limits will enable Cholderton Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes and treatment works, including replacement of old iron mains.
- Meet the demands of new and existing customers for a reliable water supply.
- Install meters at new properties and selectively meter properties identified during the company's water resource investigations.
- Deliver required levels of customer service and meet the company's existing obligations.

Efficiency and incentives in setting price limits for Cholderton Water

- Efficiency improvements assumed 2005-10:
  - average annual improvements of 2% on operating expenditure and 1% on capital expenditure.

Expenditure (£000)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		85
Infrastructure renewals expenditure	60	—
Non-infrastructure capital maintenance	85	—
Supply/demand balance	39	8
Quality enhancements	—	—
Enhanced service levels	—	—
Total	**184**	**93**
£ per property per year	46.2	124

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		136	136
Less	(1) past efficiency savings and outperformance	–	–
	(2) scope for reduction through future efficiency improvements	(5)	(7)
Plus	(3) maintaining base services	39	23
	of which:		
	a) changes in revenue	(2)	(4)
	b) changes in operating costs	27	13
	c) changes in capital maintenance	14	10
	d) changes in impact of taxation	–	–
	e) financing	–	4
	(4) maintaining security of supplies to all customers	14	15
	(5) the impact of improvements in drinking water quality	–	–
	(6) the impact of environmental improvements	–	–
	(7) improvements in service performance	–	–
Average household bill in 2009-10		184	167

* This is Ofwat's recalculation of the bill impacts based on the company's submission.

Dee Valley Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**5.7**	**-1.4**	**0.2**	**0.6**	**-0.7**	**0.8**
Company's business plan		10.4	-0.1	-0.1	-0.1	-0.1	1.9
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	107	110	107	106	106	106	-1
Typical measured bill	78	85	86	87	88	87	11
Typical unmeasured bill	121	124	120	118	119	119	-2

Company's strategy for 2005-10

To improve the reliability of its assets to ensure that it continues to provide a water supply to its customers that meets the highest standards. The main asset maintenance schemes planned for 2005-10:

- Major refurbishment of the water treatment works supplying the City of Chester.
- A water transfer scheme is also planned to safeguard the water supply to customers in a small part of its supply area covering Rhydtalog, Treuddyn and Leeswood in case of problems at the source works. The scheme requires the construction of a pumping station and water main.
- Endeavour to ensure that there is a sufficient supply of water in the future to satisfy the demands of existing and new customers by reducing leakage to even lower levels.
- Improvements in efficiency will be pursued in all areas of the business to ensure that the increase in customers' bills will be kept to the absolute minimum.

WaterVoice Wales's comments on the draft determination

- The 2005 increase is two-and-a half-times inflation, well beyond what market research indicates customers are prepared to pay.
- The large first year increase is likely to cause affordability problems especially for those on low or fixed incomes. Ideally, increases in prices should be both lower and smoothed over the five years.
- The low bill increases proposed for later years leave too many uncertainties. This may lead to interim determinations in later years and further bill increases.
- The company appears to be doing a good job in meeting the customers' main priority for safe and reliable drinking water, and is doing so at the present price level. Therefore, it is difficult to understand the justification for an increase.

These price limits will enable Dee Valley Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its treatment works. This will include the upgrade of Boughton treatment works.
- Meet the demands of new and existing customers for a reliable water supply, including linking the adjacent Llywn Onn water resource zone to the Pendinas water resource zone.
- Install more than 9,000 optional meters by 2009-10.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Dee Valley Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 1.2%;
  - capital maintenance efficiency improvements of 6.9%;
  - capital enhancement efficiency improvements of 14.4%;
- 0.1% added to price limits in recognition of Dee Valley Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		8.2
Infrastructure renewals expenditure	6.8	–
Non-infrastructure capital maintenance	16.0	–
Supply/demand balance	2.0	0.2
Quality enhancements	0.0	<0.1
Enhanced service levels	0.0	0.0
Total	**24.7**	**8.5**
£ per property per year	43	74

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**106**	**107**
Less	(1) past efficiency savings and outperformance	**–**	**–**
	(2) scope for reduction through future efficiency improvements	**(2)**	**(6)**
Plus	(3) maintaining base services	**4**	**3**
	of which:		
	a) changes in revenue	1	–
	b) changes in operating costs	4	2
	c) changes in capital maintenance	–	1
	d) changes in impact of taxation	(2)	(1)
	e) financing	1	1
	(4) maintaining security of supplies to all customers	**2**	**2**
	(5) the impact of improvements in drinking water quality	**1**	**–**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**111**	**106**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Folkestone & Dover Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**8.3**	**7.3**	**4.0**	**1.9**	**2.6**	**4.8**
Company's business plan		8.3	8.3	8.3	8.3	8.3	8.3
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	143	153	163	169	172	176	23
Typical measured bill	119	129	139	143	144	147	23
Typical unmeasured bill	162	174	186	196	203	210	29

Company's strategy for 2005-10

- Resolve the current supply demand deficit having regard to the water resource position in south-east Kent and the environmental impact.
- Progress to a position where there is enough water available and the capacity exists for transfers between water resource zones ensuring a positive security of supply index.
- Discharge appropriate water quality obligations.
- Maintain levels of service without deterioration.
- Ensure 'a reliable and continuous supply' through appropriate infrastructure investment.

WaterVoice Southern's comments on the draft determination

- The bill increase in the first year is significant. Moving expenditure to later years, where possible, could reduce the initial increase.
- Security of supply is a major issue for the region and strategies are needed to improve interconnectivity and increase storage capacity. WaterVoice supports the company's proposed Denge pipeline.
- Developers should contribute fully to the cost of reinforcing or extending the network to meet new demand.
- Blending water is a less expensive solution for dealing with nitrates and WaterVoice supports the company's approach.

These price limits will enable Folkestone & Dover Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes and treatment works.
- Meet the demands of new and existing customers for a reliable water supply. Improve security of supply with three schemes, including the Denge pipeline.
- Install 4,500 optional meters and 12,000 selective meters by 2009-10. The company is also expected to apply for water scarce area status.
- Deliver required environmental quality improvements, including:
  - an investigation into the impact of the company's abstractions on the environment.
- Increase price limits in 2005-06 by the same amount as it proposed in its business plan. We have reprofiled the company's price limits to mitigate the increase in the first year.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Folkestone & Dover Water

- Efficiency improvements 2005-10:
  - average annual operating expenditure efficiency improvements of 3.2%;
  - capital maintenance efficiency improvements of 3.9%;
  - capital enhancement efficiency improvements of 5.9%;
- 0.3% added to price limits in recognition of Folkestone & Dover Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		6.7
Infrastructure renewals expenditure	4.4	–
Non-infrastructure capital maintenance	7.3	–
Supply/demand balance	10.8	0.2
Quality enhancements	2.2	0.2
Enhanced service levels	0.0	0.0
Total	**24.6**	**7.1**
£ per property per year	68	97

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**143**	**143**
Less	(1) past efficiency savings and outperformance	**(3)**	**(2)**
	(2) scope for reduction through future efficiency improvements	**(3)**	**(14)**
Plus	(3) maintaining base services	**5**	**23**
	of which:		
	a) changes in revenue	(2)	(3)
	b) changes in operating costs	(18)	6
	c) changes in capital maintenance	5	5
	d) changes in impact of taxation	16	13
	e) financing	4	2
	(4) maintaining security of supplies to all customers	**35**	**18**
	(5) the impact of improvements in drinking water quality	**–**	**–**
	(6) the impact of environmental improvements	**25**	**8**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**202**	**176**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Mid Kent Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**9**	**0.5**	**1.9**	**2.6**	**2.7**	**3.3**
Company's business plan		15.1	4.4	1.9	0.9	0.0	4.3
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	131	142	142	144	147	151	15
Typical measured bill	112	121	122	123	126	128	14
Typical unmeasured bill	141	153	154	157	162	168	19

Company's strategy for 2005-10

- To maintain existing higher levels of service to customers, in parallel with providing least cost solutions to meet the requirements of changing circumstances and new obligations with the minimum bill increases.
- To consider long-term solutions to meet new development across the region, particularly at Ashford, to meet growth in household demand and to deal with proposed future abstraction reductions.
- To meet customers' reasonable levels of service expectations with no increases in bills for base services.
- To maintain continuity of supply such that the security of supply index remains close to 100.
- To continue to meet existing and future water quality standards and obligations.
- To continue to meet the obligations as set out in Mid Kent Water's Instrument of Appointment.

WaterVoice Southern's comments on the draft determination

- The bill increase in the first year is significant. Moving expenditure to later years, where possible, could reduce the initial increase.
- Security of supply is a major issue for the region and strategies are needed to improve interconnectivity and increase storage capacity. The work on planning Broad Oak reservoir is welcomed.
- Developers should contribute fully to the cost of reinforcing or extending the network to meet new demand.
- Blending water is a less expensive solution for dealing with nitrates and WaterVoice supports the company's approach.

These price limits will enable Mid Kent Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes and continue to maintain its treatment works.
- Meet the demands of new and existing customers for a reliable water supply, including works required to maintain security of supply in the Weald and Ashford areas.
- Make progress in the planning and promotion of a potential reservoir at Broad Oak, near Canterbury.
- Install 14,000 optional meters and 5,500 selective meters by 2009-10.
- Maintain the security of supply index at 100 for 2005-10.
- Deliver required drinking water and environmental quality improvements, including:
  - improvements at three water treatment works.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Mid Kent Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 1.8%;
  - capital maintenance efficiency improvements of 6.9%;
  - capital enhancement efficiency improvements of 10.6%;
- 0.1% added to price limits in recognition of Mid Kent Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		17.0
Infrastructure renewals expenditure	18.9	—
Non-infrastructure capital maintenance	26.6	—
Supply/demand balance	49.8	0.3
Quality enhancements	10.1	<0.1
Enhanced service levels	0.0	0.0
Total	**105.3**	**17.3**
£ per property per year	84	69

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**131**	**131**
Less	(1) past efficiency savings and outperformance	**(3)**	**(1)**
	(2) scope for reduction through future efficiency improvements	**(5)**	**(8)**
Plus	(3) maintaining base services	**17**	**8**
	of which:		
	a) changes in revenue	1	1
	b) changes in operating costs	9	6
	c) changes in capital maintenance	9	4
	d) changes in impact of taxation	(4)	(4)
	e) financing	2	1
	(4) maintaining security of supplies to all customers	**13**	**16**
	(5) the impact of improvements in drinking water quality	**4**	**5**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**157**	**151**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Portsmouth Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**-0.7**	**-0.6**	**1.5**	**2.5**	**1.0**	**0.7**
Company's business plan		7.2	4.7	2.9	2.7	0.9	3.7
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	77	76	76	77	79	80	5
Typical measured bill	87	85	85	85	87	88	2
Typical unmeasured bill	77	77	76	78	80	81	6

Company's strategy for 2005-10

Portsmouth Water's overall strategic objective is to ensure that customers continue to enjoy secure and reliable water supplies which meet all quality standards. It will maintain services to customers at the highest level in an efficient manner. The main elements of Portsmouth Water's overall strategy are:

- Avoid the need for supply interruptions.
- Maintain treatment works and infrastructure to ensure serviceability.
- Deliver the AMP4 quality programme in line with ministerial expectations.
- Ensure that high standards of service including those measured by Ofwat indicators are maintained.
- Ensure that the company remains one of the most operationally efficient water companies.

WaterVoice Southern's comments on the draft determination

- Security of supply is a major issue for the region and strategies are needed to improve network connections and increase storage capacity.
- Developers should contribute fully to the costs of reinforcing or extending the network to meet new demand.
- Blending water is a less expensive solution for dealing with nitrates and WaterVoice supports the company's approach. The Farlington mains relining scheme to reduce water discolouration is supported.
- The work on planning Havant Thicket reservoir is welcomed.

These price limits will enable Portsmouth Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Continue to maintain its pipes and treatment works.
- Meet the demands of new and existing customers for a reliable water supply including commencing the preparatory work for building Havant Thickett reservoir.
- Install nearly 11,000 optional meters and 750 selective meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - improvements at seven water treatment works;
  - relining of the Farlington main to reduce water discolouration and hence improve acceptability of tap water to customers; and
  - four investigations to assess the impact of the company's abstractions on the environment.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Portsmouth Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 0.3%;
  - capital maintenance efficiency improvements of 3.2%;
  - capital enhancement efficiency improvements of 11.0%;
- 0.3% added to price limits in recognition of Portsmouth Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		15.3
Infrastructure renewals expenditure	19.0	–
Non-infrastructure capital maintenance	7.1	–
Supply/demand balance	1.0	0.2
Quality enhancements	18.1	0.1
Enhanced service levels	0.0	0.0
Total	**45.3**	**15.6**
£ per property per year	31	53

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**77**	**77**
Less	(1) past efficiency savings and outperformance	**(4)**	**(3)**
	(2) scope for reduction through future efficiency improvements	–	**(2)**
Plus	(3) maintaining base services	**8**	**(2)**
	of which:		
	a) changes in revenue	(4)	(3)
	b) changes in operating costs	7	2
	c) changes in capital maintenance	(1)	(1)
	d) changes in impact of taxation	3	(1)
	e) financing	3	1
	(4) maintaining security of supplies to all customers	**2**	**2**
	(5) the impact of improvements in drinking water quality	**10**	**8**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**93**	**80**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

South East Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**15.8**	**2.3**	**2.2**	**0.5**	**-1.6**	**3.7**
Company's business plan		23.5	5.7	1.6	0.0	0.0	5.8
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	129	148	150	153	153	151	16
Typical measured bill	114	132	137	139	139	137	20
Typical unmeasured bill	137	158	160	164	166	165	20

Company's strategy for 2005-10

- Maintain asset serviceability by prioritising capital maintenance expenditure to ensure expenditure is focussed on areas that pose the greatest risk of service failure to customers.
- Balance supply and demand requirements for water. South East Water plans to develop water resources in its licensed area to increase the security of supply to customers and reduce the likelihood of supply restrictions in periods of extreme weather.
- Meet all legal obligations, by investment in programmes to meet the new statutory drinking water and environmental requirements.
- Deliver the customer service strategy and, as a minimum, maintain customer service performance.
- Provide a reasonable return for investors whilst maintaining the key financial indicators so that the company's financial profile has the capacity to absorb potential downside risks and uncertainties.
- Deliver increased efficiency with no increase in the risk of service failures.

WaterVoice Southern's comments on the draft determination

- The bill increase in the first year is significant. Moving expenditure to later years, where possible, could reduce the initial increase.
- Security of supply is a major issue for the region and strategies are needed to improve interconnectivity and increase storage capacity.
- Developers should contribute fully to the cost of reinforcing or extending the network to meet new demands.
- Blending water is a less expensive solution for dealing with nitrates and WaterVoice supports the company's approach.

These price limits will enable South East Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes and treatment works.
- Meet the demands of new and existing customers for a reliable water supply, including:
  - a project to expand a treatment works to increase capacity;
  - trunk mains reinforcement; and
  - construction of a desalination plant.
- Install 17,500 optional meters and 14,000 selective meters by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - renovation of 289 km of water distribution mains; and
  - improvements at two treatment works.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for South East Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 1.8%;
  - capital maintenance efficiency improvements of 4.0%;
  - capital enhancement efficiency improvements of 10.1%;
- 0.2% added to price limits in recognition of South East Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		43.2
Infrastructure renewals expenditure	49.1	—
Non-infrastructure capital maintenance	51.4	—
Supply/demand balance	57.5	1.4
Quality enhancements	15.8	0.1
Enhanced service levels	0.0	0.0
Total	**173.8**	**44.7**
£ per property per year	58	74

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**129**	**129**
Less	(1) past efficiency savings and outperformance	**(9)**	**(3)**
	(2) scope for reduction through future efficiency improvements	**(2)**	**(6)**
Plus	(3) maintaining base services	**37**	**20**
	of which:		
	a) changes in revenue	1	1
	b) changes in operating costs	18	5
	c) changes in capital maintenance	8	8
	d) changes in impact of taxation	7	4
	e) financing	3	2
	(4) maintaining security of supplies to all customers	**9**	**9**
	(5) the impact of improvements in drinking water quality	**3**	**2**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**167**	**151**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

South Staffordshire Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**9.9**	**2.5**	**1.7**	**1.0**	**1.3**	**3.2**
Company's business plan		9.7	3.9	2.5	1.5	1.8	3.8
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	91	100	102	104	105	106	17
Typical measured bill	90	99	102	104	104	105	17
Typical unmeasured bill	92	102	104	107	108	110	19

Company's strategy for 2005-10

- Increase maintenance on existing assets, both the underground distribution network and above ground assets.
- Minimise leakage and bursts.
- Maintain supplies without restriction.
- Maintain drinking water quality.
- Continue to offer customers a high level of service combined with low water bills.

WaterVoice Central's comments on the draft determination

- WaterVoice agrees with Ofwat's assessment of the level of funding.
- The first year's bill increase will cause affordability problems for many low income customers, when coupled with Severn Trent's sewerage bill increases. Where possible expenditure should be profiled for the years 2006-10 and the Government must provide help through benefits and tax credits for customers in need.
- It is important that the allowance for maintenance of pipes is sufficient to avoid poorer service associated with leaks and bursts.

These price limits will enable South Staffordshire Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes and treatment works to ensure that service is maintained.
- Meet the demands of new and existing customers for a reliable water supply.
- Install 16,000 optional meters and 250 selective meters by 2009-10.
- Deliver required drinking water and environmental quality improvements.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for South Staffordshire Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 0.3%;
  - capital maintenance efficiency improvements of 4.8%;
  - capital enhancement efficiency improvements of 13.9%;
- 0.4% added to price limits in recognition of South Staffordshire Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		33.7
Infrastructure renewals expenditure	36.3	—
Non-infrastructure capital maintenance	38.5	—
Supply/demand balance	15.1	0.3
Quality enhancements	2.5	0.1
Enhanced service levels	0.0	0.0
Total	**92.3**	**34.1**
£ per property per year	34	63

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**91**	**91**
Less	(1) past efficiency savings and outperformance	**(6)**	**(3)**
	(2) scope for reduction through future efficiency improvements	**(3)**	**(3)**
Plus	(3) maintaining base services	**22**	**16**
	of which:		
	a) changes in revenue	6	6
	b) changes in operating costs	7	3
	c) changes in capital maintenance	9	7
	d) changes in impact of taxation	(1)	(1)
	e) financing	1	1
	(4) maintaining security of supplies to all customers	**5**	**4**
	(5) the impact of improvements in drinking water quality	**1**	**1**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**110**	**106**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Sutton & East Surrey Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**12.9**	**2.0**	**1.1**	**-1.0**	**-1.1**	**2.7**
Company's business plan		33.0	2.2	2.2	2.2	2.2	7.7
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	127	142	144	146	145	143	13
Typical measured bill	111	122	127	128	126	125	13
Typical unmeasured bill	130	147	149	152	151	150	15

Company's strategy for 2005-10

The company's strategic objectives are:

- to maintain high-quality water to its customers;
- to maintain an adequate, continuous supply of water to its customers;
- to maintain a high level of service to its customers;
- to maintain an appropriate level of return to its shareholders.

Implicit in the achievement of these objectives, the key targets of the company's plan are:

- to maintain its credit ratings,
- to maintain its asset base,
- to comply with all relevant legislation and similar obligations,
- to manage water resources with a view to the future,
- to be efficient and effective,
- to meet its obligations to the environment,
- to continue to innovate and make the most effective use of modern technologies,
- to meet new challenges and obligations,
- to be a good and progressive employer.

WaterVoice Thames's comments on the draft determination

- While in principle customers prefer steady price changes, the extra cost of smoothing the increases over 2005-10 makes this approach unattractive. Under these circumstances customers' interests are better served by allowing the relatively sharp price rise in customers' bills in the first year to stand.
- The proposals for extending meter penetration are supported.
- There is concern that the cuts in the company's forecast costs of repairing and replacing mains and local supply pipes could compromise serviceability and lead to an increase in bursts and supply interruptions.

These price limits will enable Sutton & East Surrey Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes and treatment works to ensure that service is maintained.
- Meet the demands of new and existing customers for a reliable water supply.
- Install 7,500 optional meters and 23,000 selective meters by 2009-10.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Sutton & East Surrey Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure improvements of 1.8%;
  - capital maintenance efficiency improvements of 7.9%;
  - capital enhancement efficiency improvements of 16.1%;
- 0.1% added to price limits in recognition of Sutton & East Surrey Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		20.4
Infrastructure renewals expenditure	25.8	–
Non-infrastructure capital maintenance	34.3	–
Supply/demand balance	14.3	<0.1
Quality enhancements	0.9	0.2
Enhanced service levels	0.0	0.0
Total	**75.2**	**20.7**
£ per property per year	56	77

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**125**	**127**
Less	(1) past efficiency savings and outperformance	**(2)**	**(1)**
	(2) scope for reduction through future efficiency improvements	**(1)**	**(9)**
Plus	(3) maintaining base services	**45**	**20**
	of which:		
	a) changes in revenue	(2)	(1)
	b) changes in operating costs	15	5
	c) changes in capital maintenance	21	12
	d) changes in impact of taxation	8	2
	e) financing	3	2
	(4) maintaining security of supplies to all customers	**9**	**5**
	(5) the impact of improvements in drinking water quality	**4**	**1**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**180**	**143**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Tendring Hundred Water

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**-1.8**	**-0.7**	**0.6**	**-0.3**	**-0.5**	**-0.5**
Company's business plan		3.7	-1.4	0.9	0.1	0.2	0.7
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	162	159	158	159	159	158	-2
Typical measured bill	135	133	133	133	131	130	-4
Typical unmeasured bill	199	195	192	195	197	197	-1

Company's strategy for 2005-10

- Tendring Hundred Water's strategy is to maintain its industry leading performances on Ofwat's overall performance assessment, leakage, meter penetration and on the DG measures.
- The company wishes to balance affordability, maintenance of high service levels and risk with a fully integrated approach.
- The key activities proposed all relate to maintaining serviceability with little to enhance service or quality.
- The main areas for maintenance activity are the construction of two replacement reservoirs and pumping stations and investment in the raw water network.

WaterVoice Eastern's comments on the draft determination

- The proposed combination of reduced expenditure and tough efficiency targets does not represent good value as customers may notice a reduction in the level of service. The current determination should not be viewed in isolation from previous and future determinations.
- Bill increases should be smoothed over the five years.
- Sufficient funding should be included for capital maintenance to at least prevent an increase in bursts and interruptions to supply.

These price limits will enable Tendring Hundred Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes and treatment works to ensure that service is maintained.
- Meet the demands of new and existing customers for a reliable water supply.
- Install 4,500 optional meters.
- Construct two new service reservoirs and pumping stations, replacing three existing but aged facilities.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Tendring Hundred Water

- Efficiency savings 2005-10:
  - average annual operating expenditure efficiency improvements of 1.2%;
  - capital maintenance efficiency improvements of 6.5%;
  - capital enhancement efficiency improvements of 7.7%;
- 0.4% added to price limits in recognition of Tendring Hundred Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		5.3
Infrastructure renewals expenditure	6.3	–
Non-infrastructure capital maintenance	7.9	–
Supply/demand balance	0.8	<0.1
Quality enhancements	0.0	0.0
Enhanced service levels	0.0	0.0
Total	**15.0**	**5.4**
£ per property per year	41	74

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**162**	**162**
Less	(1) past efficiency savings and outperformance	**(1)**	**(1)**
	(2) scope for reduction through future efficiency improvements	**(7)**	**(8)**
Plus	(3) maintaining base services	**12**	**2**
	of which:		
	a) changes in revenue	(26)	(26)
	b) changes in operating costs	12	9
	c) changes in capital maintenance	16	12
	d) changes in impact of taxation	4	4
	e) financing	6	3
	(4) maintaining security of supplies to all customers	**2**	**3**
	(5) the impact of improvements in drinking water quality	**–**	**–**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**168**	**158**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Three Valleys Water plc

Price limits (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Average
Ofwat's final determination		**15.3**	**1.8**	**1.2**	**-0.2**	**0.1**	**3.5**
Company's business plan		15.0	13.0	2.9	1.7	1.5	6.7
Expected effect on household bills of final determination (£)							**% change**
Average annual household bill	118	134	136	138	137	138	17
Typical measured bill	98	113	117	117	116	115	17
Typical unmeasured bill	124	142	143	146	146	147	19

Company's strategy for 2005-10

- Substantially increase the pipe renewal rate from present low levels to improve the fragile condition of the pipe network, targeting the areas where customers suffer most from pipe failures. This increase will be phased across the first two years of the next review period to help minimise the impact on bills.
- Ensure there is enough water to meet present and future customers' needs against the background of climate change, by developing additional local resources and encouraging efficient use of water, principally through a significant increase in the rate of meter installation, including when residents move home.
- Maintain water quality through additional treatment to combat deteriorating raw water quality resulting from localised pollution outside the company's control. Undertake studies to determine the impact of abstraction and determine and implement appropriate remedies.
- Invest in schemes to enhance the resilience of the system against emergencies.
- Three Valleys Water believes its strategic objectives are interdependent and finely balanced, such that changes in one respect will have consequences for others.

WaterVoice Thames's comments on the draft determination

- While in principle customers prefer steady price changes, the extra cost of smoothing the increases over 2005-10 makes this approach unattractive. Under these circumstances customers' interests are better served by allowing the relatively sharp price rise in customers' bills in the first year to stand.
- The proposals for extending meter penetration are supported.
- There is concern that the cuts in the company's forecast costs of repairing and replacing mains and local supply pipes could compromise serviceability and lead to an increase in bursts and supply interruptions.

These price limits will enable Three Valleys Water to:

- Continue to maintain a safe, reliable water supply to customers.
- Increase activity to maintain its pipes and treatment works to ensure that service is maintained.
- Meet the demands of new and existing customers for a reliable water supply.
- Install 71,000 optional meters and 130,000 selective meters, installed on change of occupancy by 2009-10.
- Deliver required drinking water and environmental quality improvements, including:
  - improvements at five water treatment works.
- Maintain access to capital markets to finance the delivery of these outputs at a reasonable cost.

Efficiency and incentives in setting price limits for Three Valleys Water

- Efficiency improvements assumed 2005-10:
  - average annual operating expenditure efficiency improvements of 1.8%;
  - capital maintenance efficiency improvements of 4.9%;
  - capital enhancement efficiency improvements of 15.4%;
- 0.1% added to price limits in recognition of Three Valleys Water's good service.

Expenditure (£m)	Capital expenditure (net) Five-year total	Operating expenditure Annual average
Base service:		87.2
Infrastructure renewals expenditure	129.6	—
Non-infrastructure capital maintenance	97.4	—
Supply/demand balance	59.6	2.2
Quality enhancements	35.6	0.9
Enhanced service levels	0.0	0.0
Total	**322.2**	**90.4**
£ per property per year	52	73

What is driving the changes in bills? (2004-05 prices)

		Company business plan *	Final determination
Average household bill in 2004-05 (£)		**119**	**118**
Less	(1) past efficiency savings and outperformance	**(3)**	**1**
	(2) scope for reduction through future efficiency improvements	**1**	**(9)**
Plus	(3) maintaining base services	**30**	**16**
	of which:		
	a) changes in revenue	(4)	(4)
	b) changes in operating costs	5	5
	c) changes in capital maintenance	22	14
	d) changes in impact of taxation	3	1
	e) financing	4	—
	(4) maintaining security of supplies to all customers	**9**	**8**
	(5) the impact of improvements in drinking water quality	**4**	**4**
	(6) the impact of environmental improvements	**–**	**–**
	(7) improvements in service performance	**–**	**–**
Average household bill in 2009-10		**160**	**138**

* This is Ofwat's recalculation of the bill impacts based on the financial modelling data submitted with the business plan.

Part II Detailed explanations

8. Customers' priorities and the outputs to be delivered

- On average, 79% of customers expressed satisfaction with water and sewerage services and more than half considered them to be good value for money.
- Customers want a reliable, continuous supply of safe tap water.
- Our price limits will allow companies to undertake more activity to maintain their existing assets.
- Companies can undertake more activity to meet the demands of existing and new customers.
- Further improvements can be made to service levels, water quality and the environment.

8.1 Involving customers

Customers play an important role in the decisions we take about future water and sewerage charges. We have taken account of customers' views in arriving at our price limits.

This chapter sets out customers' priorities and how our price limits meet these priorities. It also covers, in broad terms, the services and improvements the companies will deliver in the period 2005-10.

The WaterVoice Committees told us what they thought of the companies' business plans. These plans set out the companies' views on the profile of price limits and the outputs they should deliver.

WaterVoice said that it would prefer to see a better balance between customers' priorities and investment in environmental improvements determined by the Government. It considers that customers' priorities include a safe, reliable and continuous water supply and better maintenance of the sewerage network, particularly to prevent the risk of homes and gardens being flooded with sewage.

Together with others, we have also undertaken customer research to understand the improvements that customers consider to be important and what they are willing to pay for them.

In their representations on our draft determinations, WaterVoice and customers who responded directly to us said that customers' priorities have not changed markedly. Ensuring a safe and reliable high-quality drinking water supply and preventing sewer flooding remain priorities. Customers affected by smells from sewage treatment works are also keen for these to be reduced. However, keeping price increases to a minimum and avoiding the risk

of unexpected price increases through interim determinations are also important in the light of our draft determinations.

What the customer research told us about customers' views and priorities

The key finding from the research was that customer satisfaction with services is high. On average, 79% of customers expressed satisfaction with water and sewerage services and more than half consider that they are good value for money. Customers also want existing levels of service maintained, rather than reduced.

Most customers supported the companies' investment proposals. Most support was given to:

- ensuring the safety of tap water;
- managing the appearance, taste and smell of tap water; and
- ensuring a reliable and continuous supply.

This was followed by maintaining water and sewerage systems, reducing sewer flooding and improving water pressure. Less support was given to environmental and customer service aspects, although on average all of these categories were supported by more than 50% of customers.

A majority of customers were willing to pay for the proposals in companies' draft business plans. The majority of bill-paying customers stated that they were definitely (14%) or probably (46%) willing to pay the price increases associated with the companies' strategies.

However, a significant minority were probably (19%) or definitely (14%) not willing to pay, either because the costs were too much for the improvements, or because they could not afford the increases.

Overall, 9% of the sample surveyed stated that they were not willing to pay the price increases because they could not afford the higher bills. This group included higher than average proportions of customers who were elderly and from low income households.

Some customers would accept delays to companies' proposals to keep bills down. Four in ten customers indicated that they would not be concerned if the proposals they supported were delayed to keep bills down.

Customers strongly supported steady price increases rather than step increases in bills. When asked if they would prefer to see bills change gradually, in one go, or up and down in line with company costs (assuming they did not pay more as a result), customers strongly indicated that they would prefer to see steady changes every year throughout the period.

We are aware of the effect of price increases on customers who find it difficult to afford water bills. We are contributing to the Government review which is examining the issue of affordability of water bills and options to help customers who have problems. We recognise that this is an important issue, and while we cannot set price limits on the basis of affordability, we have worked hard to ensure that customers' bills are no higher than they have to be.

8.2 How our proposed package addresses customers' priorities

We have tried to reflect customers' priorities in our proposals.

Keeping the bill impact to a minimum

Companies' final business plans included capital expenditure of £21 billion (less capital contributions), on capital programmes, compared with the £17 billion in our determinations.

We have challenged the number of schemes proposed, reducing or excluding them where value for money or the outputs are not clear. Some improvement schemes have been excluded because they do not have the support of the quality regulators. We have set the companies challenging but achievable efficiency targets.

This keeps the increase in customers' bills as low as possible but allows the companies to make the necessary improvements.

As part of our attempt to minimise the bill impact on customers, we have also examined the possibility of deferring some projects. However, the scope to do this has been limited by statutory deadlines for some improvements and by the general need to make sure that the companies' capital programmes could be managed and delivered effectively.

In our draft determinations we excluded company proposals with a gross cost of £1.4 billion, because we considered that they required further scrutiny. This could be either reappraisal, confirmation that they were required, or they did not meet our criteria for inclusion in the quality programme. Since then the companies and quality regulators have provided us with further information to clarify some of these proposals. The quality programme is now £0.4 billion larger than our assumptions in draft determinations. This is the net result of the companies and quality regulators defining projects so that they now meet our criteria; the quality regulators confirming that some projects are not now required; and refining the costs of proposals. There will be additional work confirmed as needed during the 2005-10 period; for example, resulting from the outcome of 379 investigations on the environmental impact of the sewerage service. These investigations may find that companies need to carry out further asset improvements. There are mechanisms in place to allow additional projects to be undertaken between price reviews. These are described in chapter 16.

More activity by companies to maintain their assets

Our price limits will allow companies to undertake more activity to maintain their assets. This should ensure that they continue to provide a safe, reliable water supply to customers and a high standard of treatment of discharges to the environment.

We have assumed that companies will invest £8.4 billion to maintain their pipes, sewers and treatment works over the next five years. This is a 22% increase over the assumptions made at the last review. Although less than the companies wanted to spend (over £9 billion), it is significantly more than has been spent in any period since privatisation.

Our price limits, including the associated quality improvements, would allow companies to undertake the following activities in the next five years.

- Around 23,400 km of water mains to be laid, renewed or relined over the five-year period.
- The replacement, renovation and laying of around 6,400 km of sewers.

- Refurbishing or building around 520 water treatment works and around 340 water pumping stations.

- Refurbishing or building around 1,620 sewage treatment works, 160 sludge treatment works and 640 sewage pumping stations.

More activity to maintain the balance between supply and demand so customers' demands continue to be met adequately

Our determinations assume that companies will invest £3.1 billion (gross of capital contributions) to ensure that the supply of water meets essential demands and that companies' sewerage systems can deal with the volume of waste disposed. This would include, for example, companies' continued actions to reduce leakage and projects to develop new sources of water. It would also include upgrading water and sewage treatment plants, and pipes and sewers to connect new properties in areas of housing growth.

This will deliver the following outputs.

- Installing around 1.2 million meters for household customers who opt to have a meter installed free of installation charge.

- Installing 350,000 selective meters for household customers at the companies' initiative as part of their strategy to manage demand.

- Delivering 315 Ml/d in reduced leakage by 2010 from distribution networks and customer supply pipes, including a reduction of 220 Ml/d for Thames, compared with its position in 2003-04.

- Providing water and sewerage services to over 800,000 new homes in areas of housing growth.

- Improving the security of water supplies, as measured by our security of supply index, for 13 companies.

- Carrying out investigations into water resource developments necessary to secure supply over the long term, including five potential new reservoir developments and two potential schemes to augment existing reservoirs.

- Upgrading 1,200 km of the London mains network to support leakage reductions by Thames.

- Implementing projects to increase the water available for use by more than 500 Ml/d to support supplies in 14 companies.

- Resolving newly emerging sewer flooding problems associated with extra demands placed on companies' sewerage assets.

- Carrying out improvements to meet additional flow at more than 600 sewage treatment works.

Improvements to service levels, water quality and the environment

These improvements address both the guidance provided by Defra Ministers and the Welsh Assembly Government on the quality and environmental programmes, and other improvements, principally to tackle sewer flooding.

The programmes included in our price limits assume that around £2.0 billion will be invested in improving water treatment works; and renovating water pipes, to improve the quality of drinking water delivered to customers' taps. Price limits also include £3.5 billion upgrade sewage treatment works to meet higher standards, and improve overflows from the sewerage system to limit pollution damage of the environment. The price limits also provide for some improvements to the level of service to customers, principally to reduce sewer flooding, at a cost of £0.6 billion. This is in addition to the improvements that arise from maintaining and upgrading sewers.

The programmes would deliver the following improvements for customers.

Drinking water quality

- Improving 227 water treatment works, of which 75 are needed to reduce levels of nitrates, caused by diffuse pollution, in sources of drinking water.

- Renovating 13,400 km and cleaning 8,850 km of water distribution mains, to improve the quality of drinking water delivered to customers' taps.

Environment

- Carrying out 167 investigations and/or options appraisals to ascertain the possible impact of water abstraction for the public supply on nature conservation sites.

- Carrying out 16 projects to alleviate the impact of water abstraction on the environment, such as the construction of passes and intake screens to protect fish.

- Upgrading 1,043 sewage treatment works to meet tighter consents to further protect the environment, serving the population equivalent of 21.5 million people.

- Improving 2,005 intermittent discharges and overflows from the sewerage system to limit pollution damage to the environment.

- Carrying out 379 investigations to identify any improvements needed to meet legal obligations to protect the environment.

Levels of service

- Dealing with low flow and water pressure at around 19,000 properties supplied by Severn Trent, Southern, Bristol and Cambridge.

- Improving the taste and odour of the drinking water supplied to all 190,000 properties supplied by Bournemouth & West Hampshire, and for customers supplied from three treatment works by Severn Trent.

- Reducing the hardness of drinking water for around 21,000 customers supplied by Severn Trent.

- Solving 5,360 known problems of internal and 6,030 problems of external sewer flooding. A further 3,850 newly emerging internal problems will be dealt with.

Early start programme

At previous price reviews, companies and others have told us that the price review process can interrupt the companies' capital investment programmes, followed by a peak later in the five-year period. Suppliers and contractors believe that this creates higher cost solutions.

To dampen this rollercoaster effect, in December 2003 we identified a number of capital schemes to deliver benefits to customers and the environment in the first two years of the price review period, 2005-06 and 2006-07. We have assumed that these schemes will cost £549 million for the water service for 236 schemes, and £430 million for the sewerage service for 794 schemes. These schemes include completion of outputs identified in the period 2000-05 and routine work to maintain asset systems, as well as investment to install water meters and to reduce sewer flooding. The number of schemes and associated capital expenditure differ from those published in RD42/03, 'PR04 – Early start initiative capital works to be completed by March 2007' due to changes agreed with individual companies earlier this year. Companies have subsequently agreed to the exclusion of some projects which do not have support in ministerial guidance, and these have been removed from the early start programme.

8.3 The investment programme in context

Water and sewerage services are provided through extensive asset systems built up over many generations. The water and sewerage companies need to maintain and enhance these systems to meet continuing demand. This requires substantial ongoing capital investment.

Figure 3 Actual and projected capital investment 1981-2010

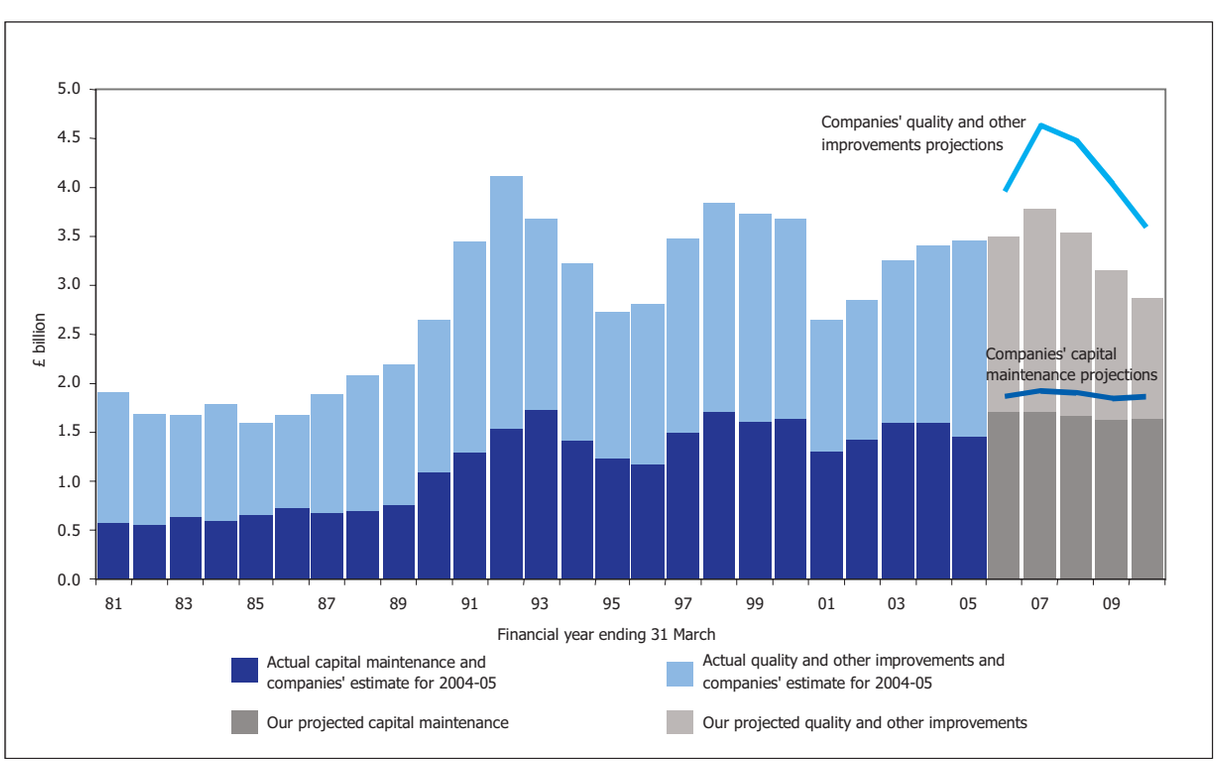


Figure 3 sets out the capital investment undertaken by the companies since 1981; it breaks investment down between investment to maintain existing assets, and quality and other enhancements. For the period 2005-10 a comparison is made between the assumptions included in our price limits and the companies' business plan projections. In overall terms, capital investment since privatisation in 1989 will amount to more than £67 billion by March 2010, which equates to around £2,900 per property served. While investment varies from year to year, and dips around price reviews, the average level is reasonably consistent at between £3.0 and £3.5 billion a year.

Planning for the next five years requires the companies and all the regulators to make judgements about the most likely capital investment and operating expenditure needed to meet the requirements placed upon the companies. The overall expenditure assumptions are a large component of the determination of price limits. As at previous price reviews, there is a divergence of views between what the companies consider they need and what we consider is reasonable. The differences between the companies (in aggregate) and our assumptions are set out both by service and by output in table 10.

Table 10 Projections of expenditure 2005-10

	Final business plans			Final determinations		
	Water £m	**Sewerage £m**	**Total £m**	**Water £m**	**Sewerage £m**	**Total £m**
Capital expenditure[1] (five-year total)						
Base service:						
Infrastructure renewals expenditure	2,242	1,144	3,386	1,868	1,028	2,896
Non-infrastructure capital maintenance	2,485	3,576	6,061	2,356	3,158	5,514
Supply/demand balance	2,409	925	3,334	1,699	590	2,289
Quality enhancements	2,336	4,516	6,852	2,061	3,450	5,512
Enhanced service levels	82	1,015	1,097	24	602	626
Total	**9,554**	**11,177**	**20,731**	**8,009**	**8,828**	**16,837**
£ per property	406	494	900	341	391	732
Operating expenditure (annual average)						
Base service	1,671	1,278	2,949	1,586	1,250	2,836
Supply/demand balance	34	15	49	23	10	33
Quality enhancements	46	109	155	22	60	82
Enhanced service levels	2	4	6	1	1	2
Total	**1,753**	**1,406**	**3,159**	**1,633**	**1,321**	**2,953**
£ per property	75	62	137	70	58	128

1 Capital expenditure is net of capital contributions.

Overall we consider that, provided the companies become more efficient year by year, they can meet our regulatory expectations within a capital investment programme of just under £17 billion over the five-year period. This compares with the companies' projections of just under £21 billion, a difference of around £4 billion. In both cases these figures are net of capital contributions, ie they represent the investment that customers would need to finance through their bills. Customers' bills will also need to continue to support the investment carried out in earlier periods.

For operating expenditure our projections are £200 million a year less than the companies' projections of around £3.2 billion a year.

There are a number of reasons for the differences between our projections and those of the companies. We have set out the major reasons for the differences in chapter 1 and these are also explained in later chapters of this report.

To help explain the £4 billion difference between our capital investment assumptions and those of the companies we have set out three main areas of difference. This follows on from our initial reallocation of companies' projections between output areas to achieve consistency between the companies' and our assessment categories. The three areas of difference are:

- 'Parked' outputs – where we consider that there is insufficient evidence or justification for an enhancement proposal to be included in price limits as yet. In some instances there is insufficient information on what is required. In others, we are concerned that the proposed projects appear to represent poor value for money. In all cases there is a need for further information and justification. Once this is available, the companies can use the MD197 'AMP4 change protocol' to include the projects in price limits. However, it is possible that work up to a value of £500 million may be confirmed for inclusion in price limits during 2005-10.

- Changes in scope – where we consider that a company has taken an unnecessarily cautious view on what needs to be done to achieve its required outputs. These differences relate partly to specific projects that we are not convinced are necessary; and partly to different assumptions about the level of uplift over past investment levels that is needed in future or the pace of change required – this is particularly the case for capital maintenance expenditure. The difference in changes in scope amount to £2.4 billion, compared with around £2.8 billion at our draft determinations.

- Greater efficiency – where we consider there is scope for greater improvements in efficiency than the levels assumed by the company in its projections. We have assumed around £1 billion more efficiency in price limits compared with the business plan projections (£0.2 billion less than assumed in our draft determinations).

Table 11 Projected capital investment: differences between the companies' projections and our final determinations

	Final business plans		**Final determinations**		Analysis of differences		
	As submitted	After reallocations	**Total**	**Difference**	Parked outputs	Changes in scope	Greater efficiency
	£ billion	£ billion	**£ billion**	**£ billion**	£ billion	£ billion	£ billion
Outputs							
Base service	9.4	9.6	**8.4**	**-1.2**	0	-1.0	-0.2
Supply/demand balance	3.3	3.1	**2.3**	**-0.8**	0	-0.4	-0.4
Quality enhancements	6.9	7.1	**5.5**	**-1.6**	-0.5	-0.8	-0.3
Enhanced service levels	1.1	0.9	**0.6**	**-0.3**	0	-0.2	-0.1
Totals	**20.7**	**20.7**	**16.8**	**-3.9**	**-0.5**	**-2.4**	**-1.0**

Table 12 sets out, for each company, the total capital expenditure we have assumed in price limits. We also set out the annual £ per property figure for each company so that direct comparisons between companies can be made.

The £ per property figures for the water and sewerage companies are much higher than for the water only companies, reflecting the respective size of the capital programmes for water and for sewerage. The figures also clearly demonstrate the impact of capital expenditure on bills. The company with the highest levels of investment per property, South West, also has the highest increase in bills as a result of our price limits.

Table 12 Capital expenditure by company

	Total capital expenditure 2005-10	
Company	**£m**	**£/property per year**
Water and sewerage companies		
Anglian	1,466	132
Dŵr Cymru	1,145	177
Northumbrian	839	113
Severn Trent	2,201	125
South West	762	216
Southern	1,563	195
Thames	3,092	150
United Utilities	2,505	170
Wessex	755	190
Yorkshire	1,453	141
WaSC total	**15,782**	**151**
Water only companies		
Bournemouth & W Hampshire	43	45
Bristol	117	48
Cambridge	17	27
Dee Valley	25	43
Folkestone & Dover	25	68
Mid Kent	105	84
Portsmouth	45	31
South East	174	58
South Staffordshire	92	34
Sutton & East Surrey	75	56
Tendring Hundred	15	41
Three Valleys	322	52
WoC total	**1,055**	**50**
Industry total	**16,837**	**147**

1 Capital expenditure is net of capital contributions.

Table 13 includes details of the annual average operating expenditure for each company that we have included in our price limits. For the water service, Portsmouth has the lowest figure at £53 per property and Folkestone & Dover the highest at £97. This reflects the differing operating conditions and treatment processes that each of them faces. For the sewerage service Thames has the lowest figure at £42 per property and South West the highest at £83, again reflecting the differing operating environments of these companies. South West operates dispersed assets to maintain bathing water standards for a very long coastline relative to the size of the company and to its customer base.

Table 13 Operating expenditure by company (annual average)

	Operating expenditure (annual average) 2005-10					
Company	**Water £m**	**Sewerage £m**	**Total £m**	**Water £/property**	**Sewerage £/property**	**Total £/property**
Water and sewerage companies						
Anglian	134	168	302	70	68	137
Dŵr Cymru	106	97	203	83	74	157
Northumbrian	130	73	203	70	63	133
Severn Trent	204	208	412	62	56	118
South West	58	54	112	78	83	161
Southern	62	113	175	60	62	123
Thames	271	228	498	78	42	120
United Utilities	200	199	399	67	68	135
Wessex	40	68	108	73	63	136
Yorkshire	125	112	237	61	54	115
WaSC total	**1,330**	**1,321**	**2,650**	**69**	**58**	**128**
Water only companies						
Bournemouth & W Hampshire	14		14	75		75
Bristol	36		36	73		73
Cambridge	9		9	72		72
Dee Valley	9		9	74		74
Folkestone & Dover	7		7	97		97
Mid Kent	17		17	69		69
Portsmouth	16		16	53		53
South East	45		45	74		74
South Staffordshire	34		34	63		63
Sutton & East Surrey	21		21	77		77
Tendring Hundred	5		5	74		74
Three Valleys	90		90	73		73
WoC total	**303**		**303**	**71**		**71**
Industry total	**1,633**	**1,321**	**2,953**	**70**	**58**	**128**

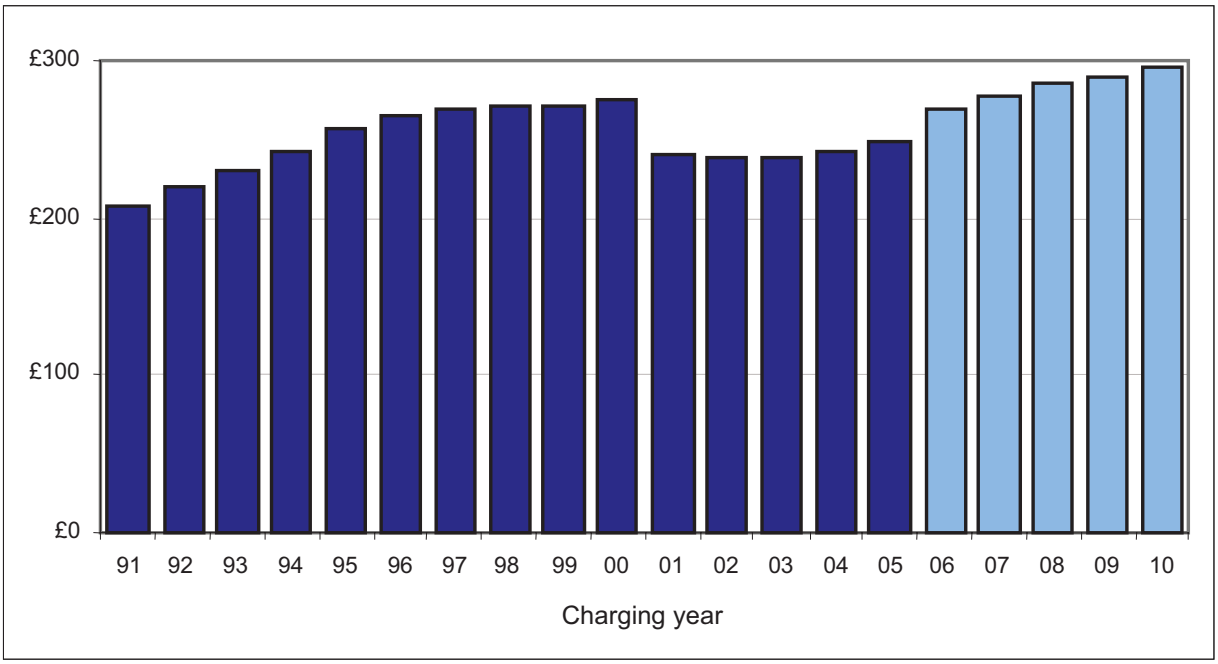
9. Price limits and bills

- Average household bills will rise by 18% in real terms over the period 2004-05 to 2009-10.
- The change in bills is a third less than companies' business plan proposals.
- Half of this increase takes place in 2005-06 to reflect the additional costs faced by the companies.
- The average household bill rise of 18% is lower than the increase of 23% implied by cumulative price limits, largely because of customers who switch to metered supplies.
- The regulatory capital value of the industry will increase from just under £35 billion to almost £41 billion.

9.1 The change in bills in context

Average household bills for the industry as a whole are projected to increase by 18% in real terms by 2009-10 compared with 2004-05. An increase of around 8.5% will occur in the first year of the new price limits, 2005-06. To put this in context, figure 4 shows the trend in average household bills since 1991.

Figure 4 Actual and projected average household bills 1991-2010



Customers' bills rose sharply in the first half of the 1990s but then rose more gradually following the price review in 1994. The price reduction in 2000-01 has been followed by further gradual rises. Overall, our price limits for 2005-10 mean that the average household bill would be 42% higher than at privatisation in 1989 – an increase of approximately 1.8% each year. Compared with bills a decade ago, they will be 7% higher by 2009-10.

This picture varies from company to company. For South West, which already has the highest bills, our price limits will increase its combined bill by 25% on average (in real terms) by 2009-10, and by 74% since privatisation (in real terms) by 2009-10. The largest bill increase since privatisation is for United Utilities, at nearly 81%. Excluding these two, the increase in bills since privatisation for the remaining water and sewerage companies will range from 15% to 50% by 2009-10.

Conversely, for two of the water only companies the bills at 2009-10 will, in real terms, be lower than at privatisation, despite increases for 2005-10.

By 2009-10, average household bills will have risen by 43% for water and sewerage companies and by 24% for water only companies since privatisation (excluding inflation). This largely reflects the greater impact of the quality improvement programmes on the water and sewerage companies.

The main components of customers' bills are:

- operating costs;
- capital charges, ie the costs of capital expenditure on improving and maintaining the asset stock (spread over the life of the assets);
- taxation;
- net interest; and
- profit after tax, ie the amount attributable to shareholders.

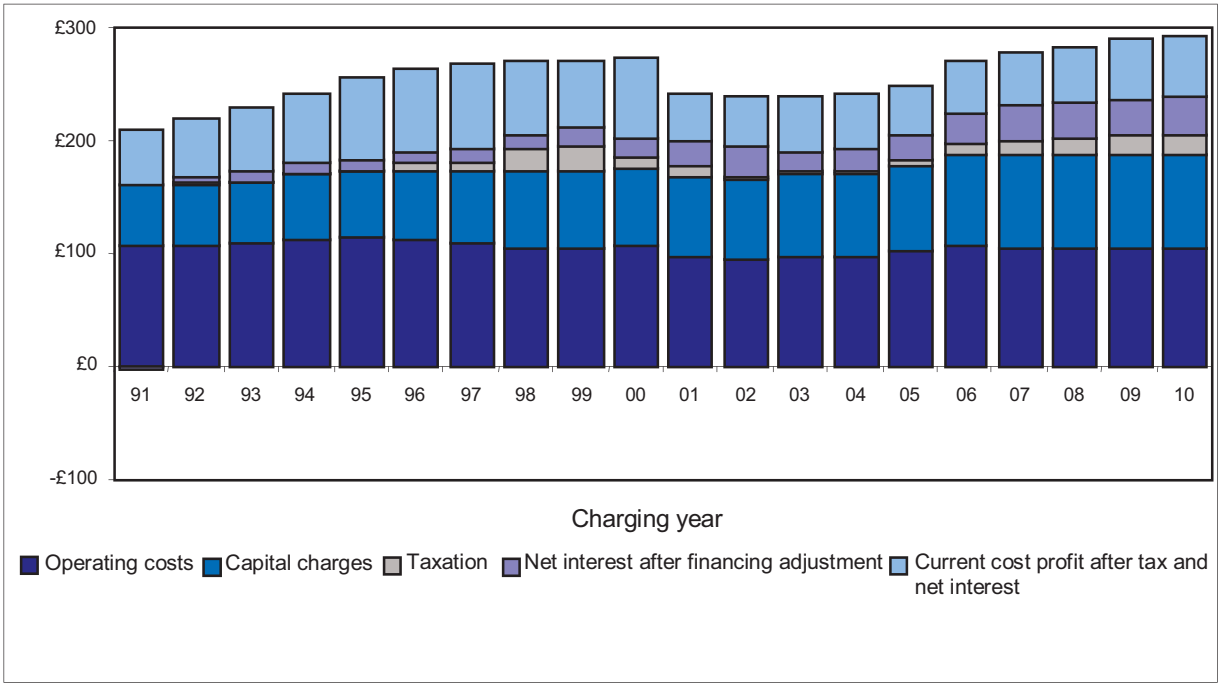
Figure 5 sets out how each of these have contributed to bills since privatisation.

This shows that operating costs as a proportion of bills are declining slowly. The capital charges (current cost depreciation and the infrastructure renewals charge) have risen since privatisation because of the significant capital programmes completed by companies. Business taxes paid by the companies were negligible until the mid-1990s but have risen steadily since then.

The return on capital is split into two components in figure 5 – interest payments and profit attributable to shareholders (including dividends). The former has risen sharply over time as debt has become a major element of companies' finances. Conversely, the proportion of the bill representing retained profits and dividends has fallen since privatisation.

By 2009-10, operating costs, at an industry level, will account for around 35% of the average household bill. At privatisation, it was over 50%. Capital expenditure (via capital charges) accounts for around 29%. Taxation accounts for a further 6%, leaving 30% for the providers of finance – debt and equity investors.

Figure 5 Components of the average household bill 1991-2010



Tables 14 and 15 set out in broad terms how each of these components break down between each area of expenditure. We have set this out for 2004-05 and also for 2009-10 to show how the picture changes over the five-year price review period.

Table 14 Components of the 2004-05 average bill

	Cost component drivers				
Output categories	Operating costs	Capital charges	Return on capital (including tax)	**Total**	**% of total**
Maintaining existing services and serviceability including sustaining <u>all</u> improvements delivered in **AMP1 & 2** (1989-90 to 1999-2000)	£90	£55	£67	**£212**	**85%**
Plus additions during AMP3 – 2000-05 to:					
1. Maintain the **supply/demand balance**	£2	£0	£1	**£3**	**1%**
2. Deliver all the required **improvements to drinking water quality and the water environment**	£7	£11	£15	**£34**	**14%**
3. Deliver all the required **service improvements**	£0	£0	£0	**£0**	**0%**
Total bills	**£99**	**£67**	**£83**	**£249**	
% of total	**40%**	**27%**	**33%**		

Table 15 Components of the 2009-10 average bill

Output categories	Cost component drivers			Total	% of total
	Operating costs	Capital charges	Return on capital (including tax)		
Maintaining existing services and serviceability including sustaining all improvements delivered in **AMP1, 2 & 3** (1989-90 to 2004-05)	£99	£71	£87	**£257**	**87%**
Plus additions during AMP4– 2005-10 to:					
4. Maintain the **supply/demand balance**	£1	£3	£5	**£9**	**3%**
5. Deliver all the required **improvements to drinking water quality and the water environment**	£4	£9	£14	**£27**	**9%**
6. Deliver all the required **service improvements**	£0	£1	£1	**£2**	**1%**
Total bills	**£104**	**£84**	**£107**	**£295**	
% of total	**35%**	**29%**	**36%**		

These tables are 'snapshots' but they can be seen as the start and finish points of this price review.

Table 6 in chapter 2 showed the breakdown of the £46 increase in the average household bill over the five years to 2009-10 increasing from £249 to £295. This is consistent with the total column in table 15 after taking into account our efficiency assumptions. For example, the increase in bills due to the costs of maintaining the supply demand balance is £11 in table 6 before we applied the efficiency improvement factors which reduces the net impact on costs to the £9 shown in table 15.

Tables 14 and 15 also illustrate both the continuing and cumulative impact on bills of the additions required in each price limit period. These additions are dominated by the costs of delivering the required improvements to drinking water quality and the water environment. Each time price limits are set the costs associated with sustaining the improvements made in the previous period are rolled up into the maintaining existing services and serviceability output category. Similarly at the next review in 2009 the 'maintaining existing services and serviceability' output category will incorporate the ongoing costs of sustaining all the improvements required in the five years 2005-10 (AMP4) as well as sustaining the improvements delivered in AMP1 (1989-95), AMP2 (1995-2000) and AMP3 (2000-05).

9.2 Price limits and household bills

The profile of price limits

The profile of price limits (and hence the profile of bills) is an important issue for customers. In economic terms, price limits and the changes in bills should reflect the changes in costs faced by the companies. Consequently, if changes in costs occur in the first year (or are first

recognised in price limits in that year), then this points to a larger rise in that year. If costs build up more evenly, then this would point to consistent rises in price limits each year.

Customers and the WaterVoice Committees would prefer that, where possible, increases in price limits are smoothed to ease affordability problems. They are particularly concerned about increases in 2005-06. Companies, on the other hand, are already bearing many of these costs and point to the pressures from financial markets to ensure that their covenants and lending conditions are not breached in the early years of 2005-10. They must remain financially stable and be able to raise capital to fund their investment programmes.

The final business plans proposed by the companies presented three general profiles:

- a steep increase in the first year (2005-06), followed by zero or small increases in the remaining four years;
- consistent rises in each year of the five-year period; or
- a significant increase in the first year (and sometimes in the second), followed by further rises in the remaining four years.

The profile of bills

A smoothed change in price limits and bills would mean that bills are higher at the end of the five-year period compared with a front-end loaded profile where prices are driven by the underlying costs. This is because not only would the companies collect less revenue in the early years, but the total revenue required by them would also increase to compensate for the additional risk. For example, the overall industry average from companies' final business plans showed an increase in the first year of 13% followed by declining increases from 7% to 3% in the next four years. This would result in an overall increase in average household bills of around 29% over the five years. Without assuming any additional revenue to compensate for risk, if this profile were smoothed, the overall increase by 2009-10 would be in the region of 38% – an additional 9% due to smoothing. This would be even higher if risk compensation were included. In the same way if we smoothed our final price limits, then the average bill would increase by 25%, rather than 18% – a 7% increase due to smoothing. Again this would increase further if risk compensation were included.

Our general principle is that the profile of price limits and bills should follow the underlying profile of the changes in costs. We noted the representations of WaterVoice Committees and customers but we consider that, in the long term, this principle is appropriate. We have therefore followed it at this review for the final price limits, with limited exceptions. Where costs and outputs can be rephased to later years (or deferred beyond the next review period), without jeopardising service levels or the financing of the company, we have done so. However, this has been possible only to a limited extent.

For South West, Bournemouth & West Hampshire, Cholderton and Folkestone & Dover we have smoothed price limits to a limited extent. South West had smoothed its price limits in its business plan because its bills are already the highest in the country, accepting that this would mean a lower than average return on capital in the early years. The rise in 2005-06 for South West would have been much higher, reflecting the cost pressures facing the company, but we have adopted the same approach and smoothed South West's price limits in the first two years. Folkestone & Dover had also smoothed its price limits over the whole five-year period, but we have followed the company's profile only in the first two years as our price limits are much lower overall than in the company's business plan. For Bournemouth & West Hampshire and Cholderton we have also smoothed price limits.

The links between price limits and bills

The increase in average household bills (ie measured and unmeasured households together) is likely to be less than that suggested by price limits for the period 2005-10. This is because price limits must be higher to allow for the loss of revenue that companies experience when household customers take up optional meters. Such customers switch to a meter because they will save money as a result of using less water or because their rateable value is higher than average or both. So companies lose revenue that must be recouped in price limits. The rate of optional metering means that, although the average household bill for the industry as a whole will rise by 18%, it is less than the increase of 23% implied by the cumulative price limits to 2009-10.

The price limits we set also take account of the change in the number of customers and the net impact that this change has on the costs and revenues of each company. For example, new customers will increase companies' revenue but this would be offset by the additional costs of supplying them. This is set out in further detail in chapters 12 and 14.

Changes in household bills and charges

The effect of some unmeasured customers opting for metered charges also means that the impact of price limits will be different for measured and unmeasured customers. Meter optants generally use less water than average and occupy properties with relatively high rateable values. This means that, relative to the group of unmeasured customers prior to switching, remaining unmeasured customers will have:

- a lower average rateable value; and
- higher average water use.

When customers with high rateable values and low consumption switch, this reduces the previous cross-subsidy to the remaining unmeasured customers – who have previously paid less than their costs of supply. Consequently, the removal of this subsidy means that they will pay more. The tariff basket mechanism ensures that this is what happens.

Bills will also be affected by changes in the way we assess the measured/unmeasured tariff differential. We use the differential to ensure a cost-reflective balance between measured and unmeasured charges. The changes we have made to the differential were set out in RD02/04, 'Measured/unmeasured tariff differentials: Conclusions', and aim to reflect more accurately the additional costs of measured charging for each company.

The revised approach means that, for most companies, measured bills are likely to rise by slightly more than the average price limit in 2005-06 and 2006-07, and for unmeasured bills by slightly less, while the new approach is phased in. Thereafter we expect measured bills to rise, on average, by slightly less than the price limit due to the impact of optional metering.

Table 16 illustrates the relative movement in the bills for typical unmeasured and measured households. The table illustrates the likely changes in bills for:

- a 'typical' measured customer, ie a measured customer whose water usage is constant over the period and is equal to the 2002-03 average for that company's measured customers; and
- a 'typical' unmeasured customer, ie an unmeasured customer occupying a property with a rateable value that is equal to the 2002-03 average for that company's unmeasured customers.

The presentation in table 16 does not take account of the savings that some customers will experience as a result of optional metering, or by reducing their water usage. For this reason, the percentage change figures show higher increases than those shown in table 4 in chapter 1 for average bills. The figures illustrate the bill impacts of price limits on these typical customers, assuming that they do not change property or their water usage. Average bills for measured and unmeasured customers will also change over time, but in a way that reflects the impact of the changing composition and water usage of these customer groups, as well as changes in charges.

Table 16 shows that in broad terms the effect of optional metering broadly offsets the changes to the measured/unmeasured tariff differential described above. As a result, for most companies, typical measured and unmeasured bills rise by similar amounts. However, there are some exceptions to this. For measured customers of Northumbrian, Severn Trent, Bristol and Dee Valley, the rise in bills is somewhat higher than for unmeasured customers. For measured customers of South West, Wessex, Bournemouth & West Hampshire, Folkestone & Dover and Mid Kent, the reverse position holds. We have set out in appendix 2 some further examples of the changes in bills for customers with differing characteristics. These figures and those in appendix 2 are illustrative only, because the precise pattern of charges is subject to a process of annual approval that we cannot prejudge.

Table 16 Change in typical measured and unmeasured household bills

Company	Household bills (£) 2004-05 Measured	2004-05 Unmeasured	2009-10 Measured	2009-10 Unmeasured	% change Measured	% change Unmeasured
Water and sewerage companies						
Anglian	244	354	272	401	11	13
Dŵr Cymru	177	314	228	411	29	31
Northumbrian	211	251	245	289	16	15
Severn Trent	200	230	255	282	27	22
South West	273	442	375	636	37	44
Southern	239	271	311	356	30	31
Thames	196	215	239	270	22	26
United Utilities	246	279	305	349	24	25
Wessex	227	302	292	407	29	35
Yorkshire	205	259	247	319	21	24
WaSC average (weighted)	**222**	**263**	**271**	**323**	**22**	**23**
Water only companies						
Bournemouth & W Hampshire	90	117	101	143	12	23
Bristol	92	113	112	129	21	15
Cambridge	82	101	91	114	11	14
Dee Valley	78	121	87	119	11	-2
Folkestone & Dover	119	162	147	210	23	29
Mid Kent	112	141	128	168	14	19
Portsmouth	87	77	88	81	2	6
South East	114	137	137	165	20	20
South Staffordshire	90	92	105	110	17	19
Sutton & East Surrey	111	130	125	150	13	15
Tendring Hundred	135	199	130	197	-4	-1
Three Valleys	98	124	115	147	17	19
WoC average (weighted)	**101**	**117**	**117**	**136**	**16**	**16**
Industry average (weighted)	**222**	**261**	**269**	**319**	**21**	**22**

9.3 Water and sewerage price limits

We set a price limit for each of the ten water and sewerage companies but we expect the bills for water delivered and sewage collected to recover fairly the separate costs of providing each service. This is important as many customers receive their water and sewerage services from different suppliers. It is also particularly important where the costs of providing the respective services are changing at different rates because of the different elements of the investment programme. Table 17 contrasts the cumulative increases for

water and sewerage for the period 2005-10, distinguishing the first year and the four subsequent years.

The indicative changes in the price limits for water and sewerage over the period 2005-10 reflect, in the main, the respective investment expenditure, operating costs, demand and efficiency assumptions for each service. At an industry level, the indicative changes are broadly similar for water and sewerage. The majority of the quality investment relates to the sewerage service but the reverse is true for supply/demand investment. Operating costs are also higher for the water service. The indicative price limits reflect the specific requirements of each company. Over the five years, the indicative price limits for Northumbrian are broadly balanced between the services. Those for Anglian, South West, Thames and Wessex are weighted towards the water service, while those for the remaining water and sewerage companies are weighted towards the sewerage service.

The indicative price limits for each service for 2005-06 show, for the majority of the water and sewerage companies, greater increases for the water service than for the sewerage service. This largely reflects greater increases in the infrastructure renewals charge and depreciation for the water service. For Thames, the very heavy weighting towards the water service reflects its overall strategy which focuses on leakage and resource development to improve its security of supply.

To ensure that customers of one service do not subsidise customers of the other, the indicative price limits are consistent with water and sewerage companies achieving a similar rate of return on capital (measured by the regulatory capital value) for each service.

Table 17 Indicative changes in water and sewerage charges 2005-06 to 2009-10

	Price limit for first year 2005-06 (%)			Cumulative price limits for four years 2006-07 to 2009-10 (%)		
		Indicative		Cumulative	Indicative	
Company	**Price limit**	**Water**	**Sewerage**	**Price limit**	**Water**	**Sewerage**
Water and sewerage companies						
Anglian	3.8	10.7	-0.4	8.4	10.4	7.3
Dŵr Cymru	14.2	18.0	10.9	13.9	9.7	17.1
Northumbrian	6.5	7.1	5.8	8.7	8.9	8.5
Severn Trent	11.8	9.0	14.6	11.2	9.0	13.6
South West	12.5	19.7	7.7	24.3	32.6	18.4
Southern	12.6	22.2	9.3	16.7	1.8	22.5
Thames	14.9	31.3	2.2	6.2	8.1	4.4
United Utilities	5.0	-0.3	9.4	18.4	14.8	21.1
Wessex	8.9	16.8	5.3	18.5	23.5	16.3
Yorkshire	5.5	5.4	5.6	15.0	11.0	18.8
WaSC average (weighted)	**9.4**	**13.6**	**7.0**	**12.8**	**11.4**	**14.3**
WoC average (weighted)	**12.4**	**12.4**		**3.6**	**3.6**	
Industry average (weighted)	**9.6**	**13.4**	**7.0**	**12.1**	**10.1**	**14.3**

9.4 Profitability and price profiles

We have a duty to enable efficient companies to finance the proper carrying out of their functions. We have considered carefully the impact that the projected profile of prices will have on the returns, profits and cashflows achieved by the companies.

A summary projected profit and loss account for the industry is shown in table 18. The table shows both the expected outturn position for 2004-05 and what was assumed at the last price review in 1999. Despite higher revenues than anticipated in 2004-05, the return expected by companies in 2004-05, measured as the return on the regulatory capital value, is lower than was assumed in price limits at the last review in 1999. This is because of higher day-to-day costs (although offset by efficiency savings) and higher current cost depreciation charges.

The projections for 2005-06 and 2009-10 show an upward trend in operating profits as companies need to finance the growing capital base resulting from the continuing investment programme. The regulatory capital value increases from just under £35 billion at 31 March 2005 to almost £41 billion by 2009-10. The level of returns as a percentage of the capital base increases slightly from 5.1% in 2005-06 to 5.7% in 2009-10. The assumed cost of capital is 5.1%, excluding the small company premium.

Table 18 Financial projections 2004-05 to 2009-10

	Current cost profit and loss account (£ billion)			
	2004-05		2005-06	2009-10
	1999 review	Actual expected		
Turnover	6.723	6.880	7.502	8.330
Operating expenditure	2.669	2.797	2.966	2.954
Current cost depreciation:				
Base service	1.315	1.631	1.549	1.465
Enhancements	0.087	0.092	0.148	0.331
Infrastructure renewals charge	0.409	0.446	0.565	0.569
Current cost operating profit	2.256	1.928	2.286	3.014
Regulatory capital value (year end)	35.312	34.718	37.045	40.727
Return on capital (post-tax)	5.2%	4.5%	5.1%	5.7%

The financial projections for 2005-10 for each company, on a five-year aggregate basis, are set out in appendix 6.

Capital charges

Capital investment expenditure on above ground assets is recovered through customers' bills over the life of the asset (rather than immediately the investment is incurred) through depreciation charges. Table 18 shows separately the depreciation charges on the assets providing the base service and those arising from enhancement investment.

Figure 6 Current cost depreciation charges for base and total assets

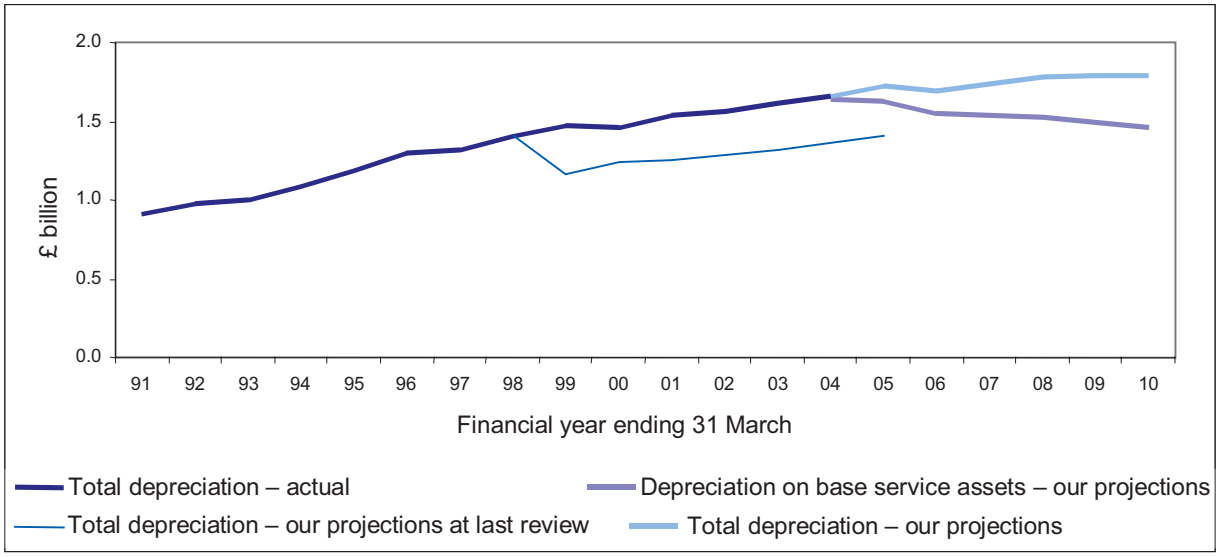


Figure 6 shows the trend in depreciation charges from 1991 to 2010. For the period of the final price limits, this shows depreciation on base services separately from total depreciation. It also compares depreciation assumed in price limits in 1999 with that charged in companies' accounts up to 2004. This shows that companies made significantly higher depreciation charges than allowed in price limits in 1999. This is a key factor in the lower than expected return on capital as shown in table 18. Most companies did not make any adjustment to their depreciation charges to reflect the long-term assessment of expenditure on maintaining serviceability to customers as was assumed in the price limits in 1999.

We have reassessed this comparison at this review and this is discussed in more detail in chapter 11. This accounts for the small dip in projected depreciation on base assets in 2005-06.

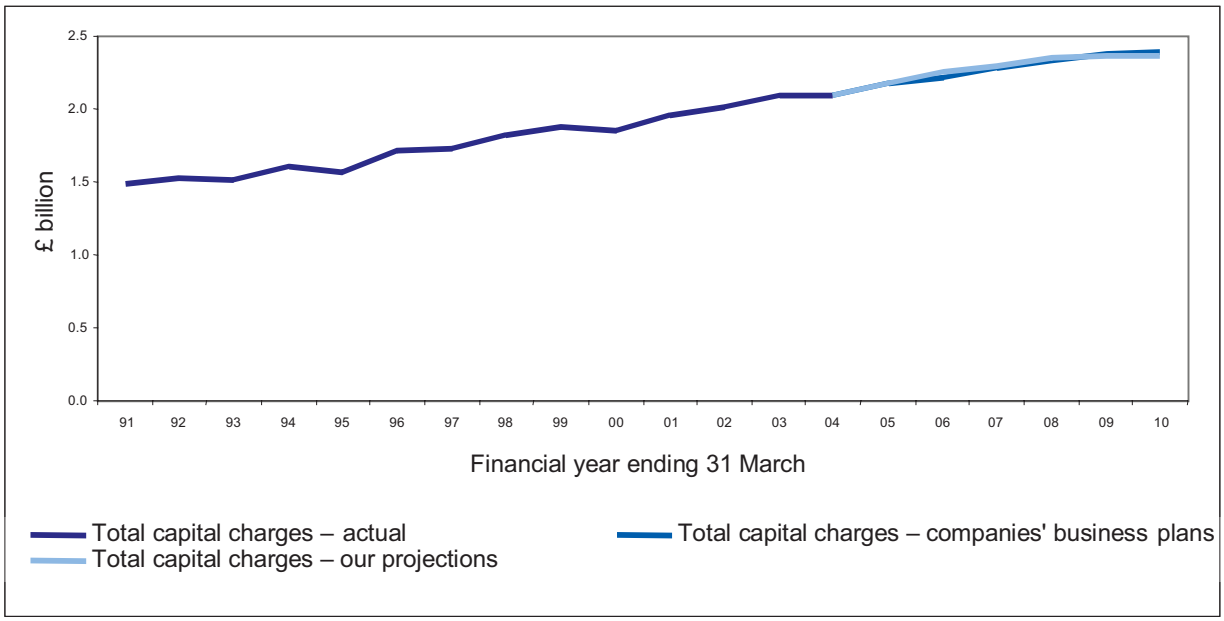
Total depreciation, however, increases because of the continued investment required for new enhancements, primarily the quality programme, which increases the capital base. Expenditure on capital maintenance and enhancements (from which the depreciation charges are derived) is discussed in chapters 11 to 13.

The projected infrastructure renewals charge reflects the average, over a 15-year period, of the infrastructure renewals expenditure required to maintain the underground network assets. It is significantly higher over the five-year period 2005-10 than in 2004-05. This is a direct consequence of the increase in proposed expenditure on underground maintenance. The serviceability to customers of the network assets and the need for increased investment is discussed further in chapter 11.

Together, current cost depreciation and the infrastructure renewals charges are called capital charges – and it is these that are reflected in customers' bills.

The trend in capital charges since privatisation is shown in figure 7. This shows the impact over time of the investment programme carried out since privatisation. In real terms, capital charges are projected to increase from around £1.5 billion at privatisation to just under £2.4 billion by 2009-10. Companies' business plans project a marginally higher trend – reaching just over £2.4 billion by 2009-10.

Figure 7 Comparison of actual and projected capital charges



Return on capital

Since privatisation, there has been a steady fall in the return on capital from its high starting position as shown in figure 8. The price limits in 1999 incorporated an immediate step change in returns down to the cost of capital. The return on capital was expected to remain fairly constant at this lower level over the period 2000-05 but it has declined, largely because of higher depreciation charges than anticipated. For 2005-10, the price limits would allow returns slightly higher than our assumed cost of capital.

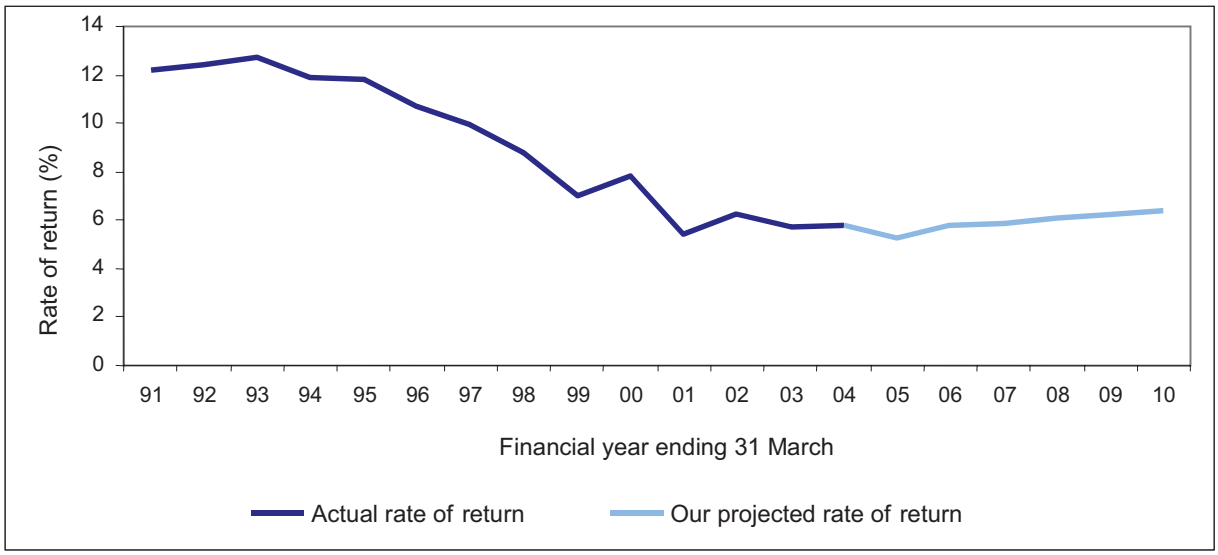
The cost of capital is not intended to guarantee shareholders' returns. A poorly managed water company might earn a lower return because it underperforms our assumptions, for example on efficiency savings. On the other hand, outperformance of our efficiency assumptions will increase returns. This is important for the preservation of incentives.

As well as future outperformance, there are other reasons why these price limits could result in a particular company earning a return above its cost of capital. For example:

- the effect of the incentive framework is such that companies which have made operating cost efficiencies in the later years of the current five-year period will earn returns above the cost of capital in the early years of the next one; and

- the effect of the service performance adjustment is to reward those companies providing a superior service by increasing their returns.

Figure 8 Post-tax rates of return[1]



1 The post-tax rate of return shown is the WACC based on the pre-tax cost of debt/post-tax cost of equity, ie the so-called 'vanilla' WACC.

These effects influence returns in the earlier part of 2005-10. In addition, the continuing large capital programme and obligations of the companies that are included in price limits continue to place a financing strain on the companies. This increases towards the end of the period and the impact of financeability constraints are greatest at that time and hence returns are higher. This adds around 1.0% per year to the price limits in 2007-08, reaching around 1.3% by 2009-10. This is set out further in chapter 15.

Finally, any general smoothing of price limits (as distinguished from phasing of costs and outputs) will impact on returns. We have made smoothing adjustments for only four companies, South West, Bournemouth & West Hampshire, Cholderton and Folkestone & Dover, as set out in section 9.2 of this chapter.

10. Efficiency and outperformance

- The scope for efficiency improvements is around 2.4% a year for operating expenditure and 3.6% a year for capital maintenance. We have assumed about half of this in price limits.
- There have been major improvements in efficiency in recent years, with all of the companies now in the top three relative efficiency bands compared with only half in 1999.
- There is still scope for many companies to catch up with the performance of the best.
- We have improved incentives to companies to encourage further progress. Twelve companies are eligible for the enhanced incentive in 2005-10.
- Two companies were significantly better performers in our overall performance assessment scores and two were significantly worse.

In this chapter we outline our policy on the balance between incentives on each company to improve its efficiency and overall performance. This is achieved through a framework that both stimulates successful and continuing outperformance of regulatory expectations, but challenges each company to improve year on year.

This chapter covers:

- incentives (for both costs and performance);
- the overall scope for improvements in efficiency;
- the assumptions in our final determinations; and
- the overall performance assessment.

10.1 Incentives

In the absence of a competitive market we use comparative competition and incentive mechanisms to drive the companies to achieve ever improving levels of efficiency and overall performance.

When we set price limits, we aim to provide each company with the right incentives, tailored to its circumstances, to improve its efficiency over time. If the incentives are right, managers of the companies will run their businesses as if they were operating in a competitive long-term market. Evidence from the last ten years suggests that generally the incentive balance has been about right. Drinking water quality and the services the industry delivers to its customers are at an all-time high. Pollution of the water environment by the industry is reducing year-by-year. This is coupled with improving levels of efficiency, from the position in the early 1990s, whereby generally more is being delivered for less. In achieving this transformation the industry has embraced new technology and new approaches to management and service delivery to customers.

The approach we follow strikes a balance between ‘carrots’ and ‘sticks’. The ‘carrots’ take the form of encouragement and additional rewards for outperforming our cost assumptions. The ‘sticks’ take the form of our assumptions of efficiency savings that are included in price limits.

The positive incentives to companies (the ‘carrots’) are directly linked to our assumptions on the scope for efficiency savings and, crucially, the proportion of the scope for efficiency that we include in price limits. The smaller the proportion of the scope included in price limits, the greater the rewards for outperforming our assumptions. We couple this with mechanisms to allow companies to retain the benefits of this outperformance.

Current incentive mechanisms

In 1999 we introduced formal incentive mechanisms that allow a company to retain, for a minimum of five years, the benefits of outperforming our expectations on costs (incremental outperformance in the operating expenditure area and total outperformance in the capital expenditure area).

We applied these rules to the companies’ performance during 1995-2000. In the price limits we have set, customers receive the full benefits of companies’ efficiencies during 1995-2000. For the most part the mechanisms we introduced in 1999 have been used to assess the appropriate rewards (incentive allowance) for outperformance achieved during the current period 2000-05. These are included in our price limits. We consulted on the changes since the last price review prior to making our determinations.

We have reviewed the operating expenditure outperformance profiles for each company. In many instances early gains have been eroded by increases in costs later in the period, so there is no additional incentive allowance to include in future price limits. Two companies’ outperformance profiles require an incentive allowance to be included in the assumptions underlying our determinations. This will ensure that they benefit from the full five years of their incremental outperformance. The companies benefiting are Northumbrian and Bournemouth & West Hampshire. This is fewer than at our draft determinations, largely because of the increased level of pension funding some companies face to deal with deficits and future contributions.

On the capital expenditure side, the majority of the outperformance in the 1995-2000 period was returned to customers in our price limits at the last review. Outperformance in the last year of that period (1999-2000) is taken into account in our price limits. Most companies have reported outperformance in the current period and this will be ‘rolled on’ on accordance with our approach, so that by 2009-10 all capital outperformance up to 2003-04 is reflected in these price limits.

Improving the incentive mechanisms

Last year we looked again at our incentive mechanisms. We consulted on our analysis, which highlighted the need for greater incentives for the leading companies and more clarity on how we deal with underperformance. We consulted on a series of changes that we considered would ensure that the mechanisms would be fit for purpose for the period 2005-10. In the light of comments made, we reviewed our proposals and set out our decisions in MD191 ‘Our conclusions on rewarding outperformance and handling underperformance’ (March 2004). The key changes that we have made enhance rewards for future outperformance for those companies assessed as leading, but also set an upper limit on the risks of underperformance that companies carry.

Dealing with underperformance – shortfalls and cost overruns

A reduction in costs is not an efficiency improvement if it is achieved by a company not delivering its outputs or by delivering them late. Nor should it be achieved at the expense of a deterioration in services to customers.

In making our assessments we check whether there has been any deterioration in services, taking action with the company to restore these to a stable position as soon as is practicable.

For price limit purposes we adjust, in a cost neutral way, outputs that are not delivered. We term this a shortfall. Other regulatory action can result from a shortfall; for example, if an expected improvement in water quality or in the environment is not achieved, this might lead to prosecution of the company by one of the quality regulators. If there is a deterioration in levels of service, we might seek formal action plans to remedy the consequences of the shortfall in the shortest practical time.

Our aim is to make the shortfall adjustments match those that we would have taken at the last review if we had known the actual delivery date. Our adjustments would be the difference in costs arising from the assumed and actual delivery timetables and any necessary change to the regulatory capital value. These adjustments allow us to revise the regulatory baselines for both operating and capital expenditure that we use to assess the scale of any outperformance that needs to be rewarded further in future price limits, using the rolling incentive mechanisms. In some instances the delayed delivery of an output may result in any associated expenditure running into the next price limit period. Where this has occurred we have carried forward into price limits the costs assumed in our 1999 determinations. In this way the company retains the project risks associated with potential cost overruns, but also retains the scope to outperform.

In our review we have identified capital projects from 2000-05 which have been delayed with a total value of £476 million. These have occurred in ten companies.

Seven companies included cost profiles in their business plans which indicated that would be delays in some 2000-05 outputs. Some companies suggested that higher costs would now be necessary for this work than we assumed when the programme was confirmed in 1999. In these cases we have decided not to include the likely cost overruns in our determinations. This leaves the 1999 determination output expectations in place, with the risks of cost overruns remaining with the company.

We have dealt with other reported capital expenditure cost overruns in line with our published approach. The general policy assumes that the company carries all the risks of cost overruns in the delivery of the outcomes and outputs assumed in the price limit determinations.

Net additional costs associated with new requirements will be recognised by us as part of an interim determination or through our logging-up mechanism, on application by the company. We consider logging-up claims associated with cost overruns on their merits at each price review.

We consider the issue of cost overruns separately for the water and sewerage services. This ensures uniform treatment between water only and water and sewerage companies. We do not carry forward into future price limits the financing costs of any cost overruns unless these exceed our underperformance threshold (as set out in MD191). This is 10% of the turnover for the five-year period for that service. Where the cost overruns exceed this threshold we do reflect in future price limits the full amount of the cost overrun that is above the threshold.

We assume that a prudent company would write off unremunerated cost overruns. Seven companies have incurred capital expenditure cost overruns in the period 2000-01 to 2003-04. One company (Thames in its water service) has exceeded the underperformance threshold.

Improving overall performance – the OPA scheme

Following the 1994 review we developed an aggregate measure of a company's performance across a wide range of services, the overall performance assessment (OPA). In the main this was a comparative measure used to identify both the leaders and those who fared less well in overall performance year by year. As with other comparative measures the publication of the resulting league tables is a strong spur for the worst performers to catch up and for others to strive to be at or near the top.

To increase the effect of these assessments in the lead up to the 1999 review we decided, after consultation, to provide the leading companies with a financial reward (up to +0.5% on price limits) and to penalise the worst performers (down to -1.0% on price limits) in the first year of price limits. The combination of annual OPA league tables and the reward/penalty rules we apply at price reviews has proved to be a strong incentive for improving performance in the current period.

In 2002, we consulted on the next steps for the OPA and the range of price adjustments we intended to use for this review. We confirmed our approach in our methodology paper. Our analysis of overall performance and the resulting rewards and penalties we have used in our price limits are set out later in this chapter.

An integrated package

We consider the incentive mechanisms described above are an integrated package. The package comprises:

- the rolling outperformance mechanisms;
- our approach to shortfalls and underperformance;
- our overall performance assessment – with its rewards and penalties; and
- the proportion of the scope for improving efficiency that we include in price limits.

The package has worked well to date. We have updated it so that each company is challenged to outperform in both efficiency and service performance during the 2005-10 period. Companies will continue to carry the risks of cost overruns but with the safety net of our underperformance threshold. In our view this is a balanced package that is consistent with our judgements on the appropriate cost of capital for the water companies.

10.2 The overall scope for improvements in efficiency

Each time price limits have been set, we have included challenging efficiency improvement factors over and above those achieved in the economy as a whole (which are reflected in net terms in the retail price index). Our overall efficiency factors have two components:

- the catch-up improvement factor that challenges a company to make progress towards the top performing companies; and

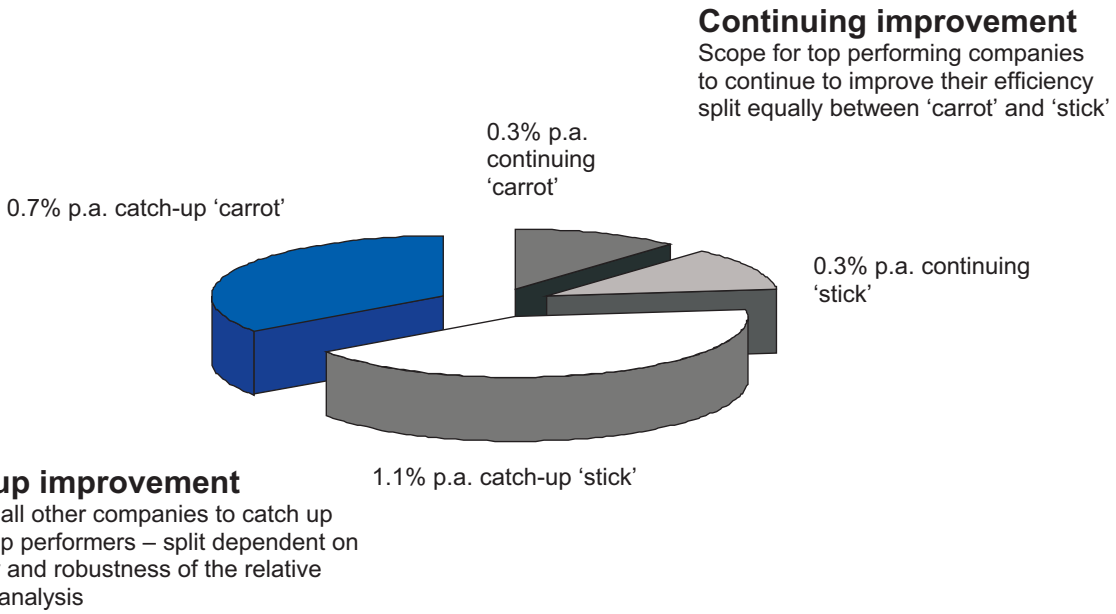
- the continuing improvement factor that is linked to the performance of the top performing companies.

These factors ensure customers benefit, through lower bills than would otherwise be the case, from real improvements in efficiency as they occur, with the balance of the benefits delayed as the companies retain these under the incentive mechanisms outlined earlier.

Figure 9 shows how our assessment of efficiency improvements for base operating costs for the water service build to an assumption on the overall scope for operating efficiency improvements of around 2.4% each year, the overall size of the 'pie' is our example. This is split into 0.6% each year for continuing improvement and 1.8% for the catch-up. We have included only half of the scope for continuing efficiency in price limits 0.3% and just over half of the scope for catch-up 1.1%. The balance represents the potential for outperformance for the companies.

Figure 9 Improving efficiency – the 'carrot and stick' model

Example: scope for improvements in efficiency – water service base operating expenditure



10.3 Companies' views on the scope for improving efficiency

We asked each company to set out its views on the prospects for future efficiency in its business plan. Their views varied widely. Some companies assumed that there was still considerable scope, including some of the top performing companies. Others took a more cautious view (some more cautious than they had indicated in their draft business plans). A few companies argued that they faced a period of significantly lower productivity than the economy as a whole. These companies argued that not only should we make specific allowances for increased costs but that we should also assume a general increase in operating and capital costs as a whole – a reduction in total factor productivity.

In their final business plans companies put forward proposals for future operating efficiency improvements ranging from 0 to 0.5% each year for water and sewerage continuing efficiency and 0 to 2.4% each year for catch-up efficiency. This compares with draft business plan estimates of 0 to 1% for continuing efficiency and 0 to 3.1% for catch-up factors. The change in companies' estimates is linked to new studies on the scope for future efficiency rather than any new evidence on future costs and technology.

For capital maintenance expenditure, companies estimated in their business plans that they could improve their annual efficiency by up to 1.0% a year. Seven companies estimated that they could improve by at least 0.5% a year, with one company considering that greater efficiencies could be gained for enhancement expenditure in the sewerage service. However, some believed that costs would increase by up to 1.1% a year.

We categorise capital investment to deliver improvements to companies' assets as capital enhancement expenditure. This is investment over and above that needed to continue to deliver the current quality standards and levels of service to customers, assuming current volumes of water supply and sewage disposal. Companies identified the scope for improvements in efficiency in quality improvements as equivalent to 3.6% of the cost of their programme for the water service on average and 2.9% for the sewerage service. This reflects in part the historical trend whereby companies have made substantial savings on past capital enhancement expenditure projections assumed in both business plans and our earlier determinations.

Most recently (and after the submission of the final business plans) the industry, through Water UK, commissioned NERA to look at the potential for future cost savings and productivity. NERA concluded that after taking into account differences in the total factor productivity for the industry compared with the general UK economy, together with differences in input prices for the industry and the economy, unit costs would rise by around 1.1% per year. While the methodology used by NERA was helpfully explicit, its conclusions are sensitive to the key assumptions in the areas of future costs and industry productivity. We do not agree with NERA's approach to moving from industry productivity figures to assumptions on real unit cost reductions. We do not believe that it is necessary to take specific account of productivity as we are both assessing water industry productivity and making an allowance for water industry specific input cost changes.

In their business plans many companies put forward well-founded and robust arguments on productivity and factor prices that would lead to very different conclusions from those reached by NERA.

10.4 Our assessment of the scope for improving efficiency

We have considered how costs will change in the next price review period. We have continued the approach adopted at previous price reviews and sought the advice of consultants with expertise in this field. We asked them to consider the prospects for future efficiency.

We see clear evidence that the industry has shown consistently higher levels of operating and capital procurement cost productivity than the economy as a whole. We made challenging efficiency assumptions in 1999 and the industry has risen to them. This is unsurprising given the environment of investment and regulatory incentives. While there is some tail-off in operating productivity growth in recent years this relates to recent changes in input prices, that disproportionately affect the water and sewerage industry compared with

the general economy. We see no reason not to expect a similar productivity margin during the next five years.

We recognise the past successes of the companies; however, we find little evidence to support the view, of some companies, that there is reduced or no scope for further efficiency improvements relative to the economy as a whole. Our analysis of the relative efficiency of the individual companies highlights that there is still considerable variation in performance with companies improving at different rates. Stimulating those companies that are not the most efficient to catch up to the current performance of the benchmark companies will deliver real efficiency improvements by the industry. Work by our consultants (and others), as well as the considered judgements of some of the leading companies, all support the view that there is still scope for the best performing and benchmark companies to make further real efficiency improvements.

One of the key questions for us is how these trends will continue into the future. In the last two years we have commissioned Europe Economics, London Economics, and Stone & Webster to look at the issue. The industry trade body, Water UK, commissioned NERA to investigate, and companies have employed other consultants, including OXERA and Frontier Economics, to look at aspects of this issue. At the same time Ofgem, the energy regulator, in carrying out the price review for electricity distribution companies, commissioned Cambridge Economic Policy Associates (CEPA) to look at the prospects for the electricity industry. CEPA, as part of its review, also looked at the water industry. A range of industry productivity growth forecasts has emerged, from 0.4% per annum (NERA) to 2.6% per annum (CEPA).

We have reviewed these reports carefully. We have examined thoroughly all of the arguments and assessments made by water companies. We have updated and refined our analysis of the relative efficiency of each company in its operations, in capital maintenance and in capital works, using the latest information from companies. We have looked closely at assessments made by the leading water companies.

While the opportunities for the extensive labour productivity gains of the early years will be fewer in the future, this will continue to be in part offset by the continuing major capital investment programmes.

There is also evidence that the scope for efficiency may be higher for the sewerage service than for the water service. In part this reflects the opportunities for synergies between the large environmental programme and expenditure on operations and capital maintenance. We take account of this in our assumptions of continuing efficiency.

Using this information, the work submitted by companies in their business plans, and our study of companies' cost trends, we have been able to take a view on the overall scope for future improvements in efficiency. Our consultants have provided advice, but these are our decisions based on all the evidence available.

Most of the evidence we see confirms the general view we took in 1999. We see no reason for the industry not to continue to exhibit higher than average productivity growth. In particular, the enhancement programmes are continuing at broadly the same level for most companies. So we think that it is prudent to assume a positive productivity differential, and we see no convincing evidence to support the negative assumption proposed by NERA and some companies.

When we look more closely at the factors contributing to productivity in the past we find that some, such as the legacy from pre-privatisation days, have declined. Others, such as the investment in new environmental and water quality standards, continue unabated. In other areas, drivers of higher costs are no longer significant. For example, there is not the same

need to provide the transitional investment to reach higher customer service standards that there was in 1999. Additionally, most companies are now at an economic level of leakage.

In their responses to our draft price limits many companies reiterated the concerns included in their business plans. They said that our approach to efficiency was not well founded. Since our draft determinations we have revisited our assessment of relative efficiency using the latest data. We conclude as a result of our direct analysis of real costs that the scope for future base operating efficiency is around 2.4% a year for water and slightly less for sewerage. This is within the range of recent estimates summarised in NERA's paper for Water UK and is less than we assumed in 1999. Most companies' circumstances will continue to be similar to the current period, and we have made realistic adjustments for input prices. We see no reason why companies' productivity growth should stop or reverse.

Our overall assessment of the scope for improvements in operating efficiency is a continuing annual efficiency of around 0.6% for the water service and 1% for the sewerage service. Taken together with the potential for companies to catch up, this would imply an overall scope for efficiency over the five years of around 2.4% a year.

The reduction in our view on the scope for future efficiency relates to two factors. First, we have used the more up-to-date data provided in the 2004 June return. This shows a reduced range of performance. Secondly, we have accepted the arguments made by some companies that the particular circumstances of Thames' sewerage operations precluded its use as the benchmark.

The scope for capital maintenance and capital enhancement efficiency continues to benefit from the synergies available with a large environmental and water quality programmes. Companies can also drive down costs and make significant efficiencies in planning of capital works.

If companies can achieve our outputs in a different way, at a lower cost, they benefit from the efficiencies for five years. This ongoing challenge to outperform our assumptions has been a driver for increased efficiency and innovation in capital procurement in the water industry, We believe that the incentive for the companies to continue to outperform is strong and this is demonstrated by the outperformance so far for the period 2000-05.

We have assumed the same scope for continuing annual efficiency for capital works as in our draft determinations. The catch-up improvement factors for both the capital maintenance and capital enhancement programmes are slightly lower. We have changed this for a number of reasons including representations on the cost base unit costs; our allowance for special factors; and our adjustment of econometric bands to reflect the revised capital expenditure programme. These assumptions are set out in table 20 in this chapter.

10.5 Efficiency improvements assumed in price limits

As set out earlier, our approach to incentives seeks to achieve an appropriate balance between carrots and sticks. Consequently, we have not included the whole of the scope for productivity in price limits. In overall terms, our price limits have included under 60% of our views on the scope for improving efficiency in base service with slightly more in the enhancements area.

Operating cost efficiency

Table 19 sets out the overall scope for efficiency and the efficiency assumptions included in the price limits for operating expenditure for both the base service and that related to service improvements.

Table 19 Operating expenditure efficiency

Operating expenditure – annual average rate of improvement	Efficiency improvement factors assumed in our draft determinations			Potential outperformance incentive			Likely overall scope
	'Sticks'			'Carrots'			
	Catch-up improvement factor	Continuing improvement factor	**Total 'stick' improvement factor**	Catch-up out-performance	Continuing out-performance	**Total out-performance 'carrot'**	
Water service – base	1.1%	0.3%	**1.4%**	0.7%	0.3%	**1.0%**	**2.4%**
Water service – enhancements	1.4%	0.45%	**1.85%**	0.4%	0.45%	**0.85%**	**2.7%**
Sewerage service – base	0.8%	0.5%	**1.3%**	0.5%	0.5%	**1.0%**	**2.3%**
Sewerage service – enhancements	1.0%	0.75%	**1.75%**	0.3%	0.75%	**1.05%**	**2.8%**

In price limits, we have assumed the frontier shift or continuing efficiency factor is 0.3% a year for the water service and 0.5% a year for the sewerage service. This is around half of the possible scope for continuing efficiency.

The catch-up factors vary from company to company but in aggregate amount to 1.1% a year for base operating costs for the water service and 0.8% a year for the sewerage service. Our analysis of catch-up factors is set out later in this chapter.

We expect all companies to achieve the efficiency factors included in our price limits. We believe that the incentives in place make it worthwhile to achieve all the 'carrot' element and to seek to move beyond this. But to achieve all of the scope – stick plus carrot – is a real challenge which not all companies will be able to achieve.

We have provided in the price limits for certain increases in base operating expenditure. These would increase base operating costs by around £200 million or 7.2% before applying efficiency improvement factors. More detail is provided in chapter 11.

The reasons for this increase are two-fold. First, the circumstances surrounding base operating costs in recent years – such as rising energy costs and higher pension scheme contributions – have led to upward trends. Secondly, the capital schemes put in place to enhance the environment and improve water quality bring with them higher operating costs.

Overall, our assessment of efficiency improvements and our approach to changes in input prices leads to broadly stable base operating costs over the 2005-10 period. On a comparable basis, this is not inconsistent with the views of consultants and many companies.

We published earlier our rationale and policy for applying higher improvement factors for forecast increases in operating expenditure arising from the improvement and enhancement programmes. We have assumed continuing improvement factors for operating enhancement expenditure will be 0.45% a year for the water service and 0.75% a year for the sewerage service. This is half as much again as the continuing improvement factor assumed for base

operating expenditure. Catch-up factors average 1.4% a year for water and 1.0% a year for sewerage.

Capital maintenance efficiency

For capital works we believe that there is more scope for continuing efficiency than in operating costs due to the effect of the continuing large capital programme and the history of companies becoming more efficient in this area. The majority of the future capital programme relates to the sewerage service, so we have assumed a slightly higher scope in this area for capital maintenance projects. The capital maintenance efficiency assumptions for both continuing efficiency and the catch-up element for the industry are set out in table 20.

Table 20 Capital expenditure efficiency

Capital expenditure – cumulative improvement over the period 2005-10	Efficiency improvement factors assumed in our draft determinations			Potential outperformance incentive			Likely overall scope
	'Sticks'			'Carrots'			
	Catch-up improvement factor	Continuing improvement factor	**Total 'stick' improvement factor**	Catch-up out-performance	Continuing out-performance	**Total out-performance 'carrot'**	
Water service – capital maintenance	5.4%	2.5%	**7.9%**	6.6%	2.5%	**9.1%**	**17.0%**
Water service – capital enhancements	8.2%	3.7%	**11.9%**	2.6%	3.7%	**6.3%**	**18.2%**
Sewerage service – capital maintenance	6.2%	3.0%	**9.2%**	6.6%	3.0%	**9.6%**	**18.8%**
Sewerage service – capital enhancements	8.5%	4.4%	**12.9%**	2.7%	4.4%	**7.1%**	**20.0%**

We have assumed continuing improvement factors of 2.5% for water over the five years for capital maintenance expenditure and 3.0% over the five years for sewerage – in each case half of the possible scope for improvement.

At the 1999 review, our assessment of the overall scope for efficiency in capital maintenance was higher. It was also well above the estimate of improvement in general capital productivity for comparable industries, which our consultants considered was 5-10% for the five years to March 2005. For the water service we assumed that out of the total scope available, during the five years, of 24.7% companies would achieve at least 13.4% efficiency improvements. The corresponding figures for the sewerage service was 28.5% and 14.9%. These comparisons are set out for both operating costs and capital maintenance in figures 10 and 11.

Although companies regarded these assumptions as challenging at the time, they have outperformed the sticks in the first four years of the current period. The average annual outperformance for the water service is 1.0% and 1.2% for the sewerage service. This suggests that if the current trend continues companies will have improved efficiency by about three-quarters of the overall scope that we assumed at the last review.

The way that the capital maintenance catch-up element efficiency is calculated is company-specific. It depends on each company's econometric and cost base submissions. This is set out later in this chapter.

Capital enhancement efficiency

Capital enhancement continuing efficiency factors are 50% more challenging than the capital maintenance assumptions. This reflects the enhanced scope for efficiency in planning and implementing new projects compared with the more repetitive work associated with maintenance. There is a historical trend of substantial outperformance of previous regulatory assumptions that also supports the adoption of higher factors. During the four years 2000-04 companies have outperformed our combined improvement factors, on average, by about 2.1% a year for water and about 4.7% for sewerage enhancement projects. Furthermore, there is no evidence that an apparent systematic bias towards overestimating the costs of improvements has been corrected by the industry. Like capital maintenance, we have assumed a slightly higher scope for the sewerage service because of its greater share of the capital programme.

Again, the scope for continuing efficiency is split in half and only half of the scope is included in price limits. The enhancement expenditure efficiency assumptions for both continuing efficiency and the catch-up element for the industry are set out in table 20. We have assumed continuing improvement factors for capital enhancement expenditure will be 3.7% over the five years for the water service and 4.4% for the sewerage service.

For some types of work, we compared unit capital and operating costs between companies. Where we applied a challenge based on these comparisons between companies, the catch-up assumptions for capital and operating costs were discounted from the unit costs challenge.

10.6 Comparison of efficiency assumptions at this review and the 1999 review

A number of companies made representations that the efficiency assumptions we made are unreasonable or even unachievable. In general, companies assumed lower efficiency factors in their business plans than we have.

In the past companies have made similar representations but have generally managed to outperform our challenging targets. We acknowledge the companies' achievements in continuing to become more efficient and the benefits that this has given to customers in terms of lower bills.

We accept that the rate of improvement in efficiency may not be as large as it was immediately after privatisation. This is reflected in the lower overall scope for efficiency that we have assumed at this review compared with the review in 1999. We have also given companies an increased incentive to outperform our catch-up targets by increasing the proportion of the 'carrot' available.

A number of stakeholders wanted to compare our current assumptions on future efficiency with those made in 1999. While we did not characterise our decisions in 1999 in terms of 'carrots' and 'sticks' it is possible to make some meaningful comparisons. Figures 10 and 11 show the efficiency assumptions for operating costs and capital maintenance made at this review compared with those in 1999. This is sub-divided into 'carrots' and 'sticks' and into our assumptions for catch-up and continuing efficiency.

It is not possible to separate out the continuing efficiency 'carrot' for operating expenditure at the 1999 review. In figure 10, we have indicated this lack of certainty by using a 'dotted' area.

However, it is clear that this element is unlikely to be zero because we specifically stated at the time that we had included only the minimum continuing efficiency factor in price limits.

Figure 10 Operating cost efficiency assumptions at this and the 1999 review

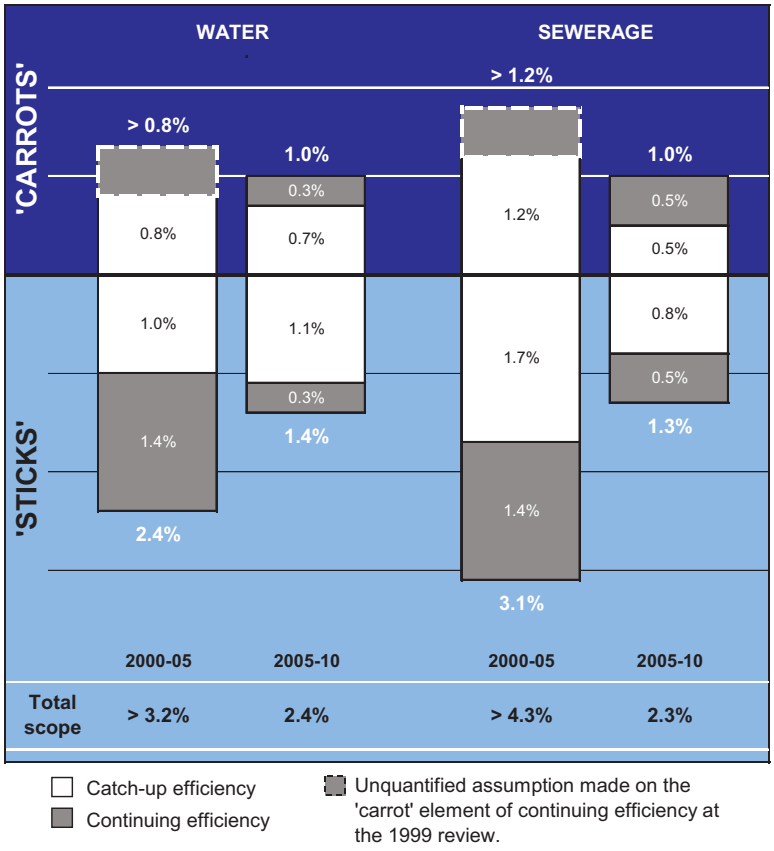
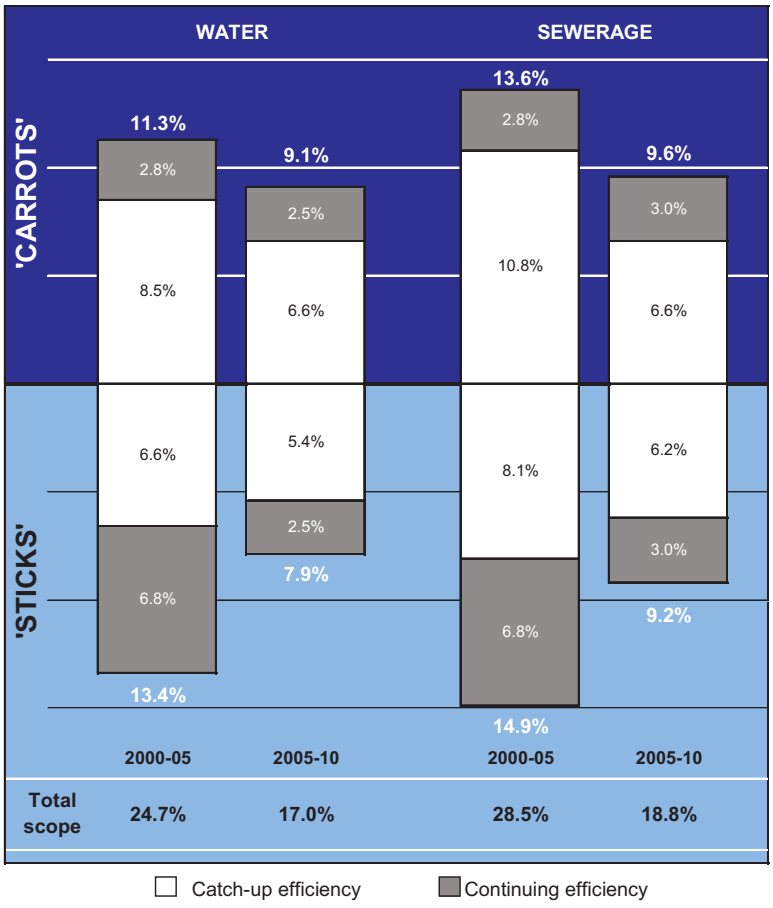


Figure 11 Capital maintenance efficiency assumptions at this and the 1999 review



10.7 Assessing relative efficiency

Each year we publish our most recent assessment of relative efficiency in our report on water and sewerage service unit costs and relative efficiency. The improvement in relative efficiency since 1999 is striking. We now see companies clustering around the industry frontier for operating costs and capital expenditure, with several companies showing at or near best in class performance in both operating and capital maintenance efficiencies.

We make a separate assessment for the water service and the sewerage service for both operating efficiency and capital maintenance efficiency. When setting prices we use these assessments as the basis for company-specific assumptions on future efficiency.

We considered carefully the position for each service (water and sewerage) and each area of expenditure. We carefully tested our potential benchmarks to assure ourselves that these are not mutually incompatible and take some comfort from major companies being at or near the benchmark for both operating and capital maintenance efficiency.

Operating expenditure relative efficiency

Our approach to assessing relative efficiency uses statistical modelling and is based on companies' audited cost data. We also take account of costs that are unusual for particular companies or groups of companies. We make adjustments to data where there are clear cost allocation problems, and we take account of the possibility of errors arising from the sample size limitations and the particular modelling process. We have also taken account of the increase in future pensions contributions when we have assessed relative efficiency.

We have improved our processes since 1999. We have, in consultation with the industry, tested and debated the merits of alternative models. Our understanding of the industry and its cost structure improves with better data year on year and from our continuing debate with individual companies. We publish our analysis to allow a constructive dialogue. However, there is still some criticism from some companies. The key areas of concern are as follows.

- In using separate frontiers for operating expenditure and for capital maintenance expenditure we run the risk of creating unrealistic cost expectations.

- The apparent differences in the outputs from the models are more due to data error than to differences in efficiency.

- The models developed from the data do not reflect the reality of the industry.

- There is too much dependence on a single approach to assessing relative efficiency.

- 'Non-controllable' costs are not excluded from the analysis.

We have considered and investigated each of these concerns. On the first point we think that the demonstrated level of performance for the most recent year, 2003-04, where a number of companies were at the frontier for both operating and capital maintenance expenditure, should allay these concerns. Clearly, if one or more companies are at the frontier for both operating and capital expenditure then it is difficult to argue that there is a possibility that the combination of costs represented by the two frontiers is in some way unrealistic.

We have introduced for the first time a specific adjustment to the model outputs to take some account of the underlying error term in the model residuals. We make a reduction to the residual of 10% for water and 20% for sewerage (where we have fewer companies to compare). In addition, we have carefully considered a critical analysis of our approach but we remain confident that when considered as a whole it deals appropriately with the uncertainty that surrounds any use of statistical tools for decision making.

Over the past three years we have worked with the industry to test and redesign the models, to identify and improve our knowledge of company-specific factors, and to test alternative approaches. We have considered all the points raised by companies and tested each of them. We have thought carefully about how the models relate to the reality of providing services to customers. We are confident that we are not misusing the data we collect and that we are interpreting real and material differences in performance. We have not found any items of data that we do not collect that would materially improve our analysis.

Finally, we have used, as we did in earlier reviews, alternative approaches to test our results. We have prepared a single whole service model to test the overall results, and we have looked at our data using alternative modelling techniques such as stochastic frontier analysis and data envelopment analysis. Each confirms the general dispersal of companies' results.

Our assessment of relative operating efficiency is not based on econometric and unit cost modelling of all operating costs. We find that the quality of the model outputs is improved if we exclude certain costs which do not scale with the key model driver. These costs include local authority rates, Environment Agency charges and third party costs. We do not exclude these costs from the modelling because we think that they are not controllable – we see scope for managers to challenge and reduce all these costs.

Capital expenditure – relative efficiency

For capital expenditure we analyse relative performance using both econometrics and capital works unit costs – 'the cost base'. We use a combination of these techniques to set the efficiency factors for capital maintenance. We use the procurement efficiency derived from the cost base only to arrive at the capital enhancement efficiency factors.

We described our econometric modelling approach in our 'Water and sewerage service unit costs and relative efficiency – 2002-03 report' (January 2004). We have adjusted the published method of allocating companies into econometric efficiency bands for this review to take account of the projected expenditure for the six years, 2004-05 to 2009-10. Combined with the actual expenditure recorded for the six years 1998-99 to 2003-04, this gives a 12-year period of actual and projected costs. We believe that this gives a better estimate of the relative efficiency for the purpose of assessing the scope for catch-up improvements. We have included an explanation of this approach in appendix 3.

The cost base comprises a set of capital cost estimates referred to as standard costs. We compare these costs company by company to assess the relative capital cost efficiency. We have included an explanation of the approach in appendix 4.

Although these standard approaches are applied to each company, as with our econometric work on operating efficiency, we recognise that some companies have special factors. We have taken account of these in our analysis. Since the draft determinations we have revised our approach to calculating a regional price adjustment for the costs of companies which operate in relatively higher cost areas, such as the south-east of England. We apply strict rules to assess our frontier performance benchmarks for both the econometrics and the cost base.

The current position on relative efficiency

Tables 21 and 22 show both the operating expenditure and capital maintenance expenditure assessments of relative efficiency used in our determinations for water and sewerage respectively. The clustering towards best performance is clear, as is the evidence that some companies still have considerable scope to improve their efficiency if they are to achieve the performance of the best.

However, this shows that there have been major improvements in efficiency, with all companies now in the top three relative efficiency bands compared with only 50% at the last review in 1999.

Table 21 Relative operating and capital maintenance efficiency – water

Operating efficiency banding (2003-04)						
	A Within 5% of benchmark			Southern	Severn Trent, Wessex, Cambridge	Yorkshire, Bournemouth & W Hampshire, Portsmouth, South Staffordshire
	B Between 5% and 15% of benchmark			Dee Valley	Anglian, Dŵr Cymru, United Utilities, Mid Kent, Sutton & East Surrey, Tendring Hundred	Northumbrian, South East, Three Valleys
	C Between 15% and 25% of benchmark				Bristol	South West, Thames, Folkestone & Dover
	D Between 25% and 35% of benchmark					
	E Greater than 35% of benchmark					
		E Greater than 40% of benchmark	D Between 30% and 40% of benchmark	C Between 20% and 30% of benchmark	B Between 10% and 20% of benchmark	**A Within 10% of benchmark**
		Capital maintenance efficiency banding (2003-04) (combined)				

The most efficient company on operating cost efficiency is Portsmouth. The most efficient company on capital maintenance based on the combined results of the cost base and econometrics is Yorkshire.

Table 22 Relative operating and capital maintenance efficiency – sewerage

Operating efficiency banding (2003-04)						
	A Within 5% of benchmark				Severn Trent	Thames, Wessex, Yorkshire
	B Between 5% and 15% of benchmark			Southern, United Utilities	South West	Anglian, Dŵr Cymru, Northumbrian
	C Between 15% and 25% of benchmark					
	D Between 25% and 35% of benchmark					
	E Greater than 35% of benchmark					
		E Greater than 40% of benchmark	D Between 30% and 40% of benchmark	C Between 20% and 30% of benchmark	B Between 10% and 20% of benchmark	**A Within 10% of benchmark**
		Capital maintenance efficiency banding (2003-04) (combined)				

The most efficient company on operating cost efficiency is Thames. The most efficient company on capital maintenance based on the combined results of the cost base and econometrics is Wessex.

10.8 Our assumptions for catch-up improvement factors

Operating expenditure

The operating expenditure catch-up factor assumes that a company will catch up 60% of the assessed efficiency gap from its current performance to the frontier performance in 2009-10, with equal improvement steps in each year. For the water service we have set the frontier at Wessex's performance even though this is exceeded by both Portsmouth and South Staffordshire. This is consistent with our policy of using a single larger company or a series of smaller companies that in aggregate are equivalent to more than 2% of the national turnover for the water service. We have maintained our linear five-band model, A to E, with each band being divided into an upper and lower part. The appropriate catch-up improvement factors for these bands are set out in table 23.

For the sewerage service we have set the frontier at Yorkshire's performance. Thames has better relative efficiency results, but these are influenced by a significant number of local factors including its large London works. In our draft determinations we used Thames as the benchmark company but have reconsidered this in the light of representations. This is consistent with the 1999 review when we also decided not to use Thames as the frontier because of this. This has improved the relative performance and hence bandings for the other water and sewerage companies.

Table 23 Operating expenditure – performance bands and associated catch-up improvement factors

Operating efficiency Performance bands		Assumed catch-up improvement factors (five-year total) (%)	
		Water service	Sewerage service
A	Frontier or better	0	0
	Lower	1.5	1.5
B	Upper	4.5	4.5
	Lower	7.5	7.5
C	Upper	10.5	10.5
	Lower	13.5	13.5
D	Upper	16.5	16.5
	Lower	19.5	19.5
E	Upper	22.5	22.5
	Lower	25.5	25.5

We have reviewed the results of our 2003 relative efficiency analysis to check whether the ranking and bands are consistent with the position reported for 2003-04. For final determinations we have used 2003-04 costs as a basis for future costs and as the data source for our relative efficiency modelling.

The catch-up factors range between 0% and 2.7% a year for water and between 0% and 1.5% a year for sewerage in our final determinations.

Capital maintenance expenditure

Our relative efficiency analysis shows that there is still a significant gap between the most efficient companies and the less well performing companies for capital maintenance expenditure. The most efficient company for the water service is Yorkshire. For the sewerage service the most efficient company is Wessex.

We combine the efficiency targets generated from the cost base and from econometrics, with equal weightings, to arrive at our assessment of the appropriate catch-up factor for each company. We have followed our published policy and assumed in our factors that the less efficient companies will improve their efficiency, and reduce the efficiency gap by between 40% and 50%. We assume a 40% catch-up factor to the econometric benchmark and a 50% catch-up to the cost base benchmark. We assume that this improvement will be achieved in three equal steps over the first three years of the 2005-10 period, rather than in one year as we did at the last review.

In our price limits, the catch-up factors range between 0% and 3.6% for both the water and sewerage services for each of the three years 2005-06 to 2007-08.

Econometrics and the cost base catch-up factors for capital maintenance projects are set out in appendix 3 and appendix 4 respectively.

Capital enhancement expenditure

The company-specific catch-up element for enhancement projects is based on a comparative assessment of the cost base submission only. The cost base includes examples of standard enhancement programmes and uses a representative sample of a company's investment programme for the period 2005-10 to generate the catch-up factors. The capital enhancement cost base factors are set out in table 56 in appendix 4.

As previously, and in line with our published policy, we have made similar judgements on the scope for the least efficient companies to catch up with the most efficient ones. Our assumption is that the less efficient companies can catch up 75% of the gap between themselves and the benchmark companies in each year over the five years to 2009-10. We have applied these catch-up factors to the whole capital enhancement programme. In these price limits, the catch-up factors range from 1.7% to 26.2% over the five years for water and between 1.8% and 15.9% over the five years for sewerage.

10.9 Incentives

As set out earlier in this chapter we intend to enhance the incentives for the leading companies at the 2009 review. This does not impact on the price limits for 2005-10 but should stimulate the leading companies in that period.

Our latest relative efficiency analysis has identified a number of leading companies that meet our criteria. These companies would qualify for the enhanced rewards for future outperformance if their position is confirmed in our final analysis. The current qualifying companies are set out in table 24.

Five companies qualify for the higher multiple on future operating expenditure outperformance and four on capital expenditure. This includes Wessex who qualify for the higher multiple on the water service for both operating and capital expenditure. Five companies qualify for the lower multiple on operating expenditure and four on capital expenditure. Table 24 shows that Wessex and Severn Trent qualify for a multiplier in all of the efficiency assessments.

Table 24 Companies likely to be eligible for enhanced rewards for future outperformance

	Companies at the efficiency frontier 50% uplift (1.5 multiplier)	Companies within 5% of the efficiency frontier 25% uplift (1.25 multiplier)
Water – operating expenditure	South Staffordshire, Portsmouth, Wessex	Bournemouth & W Hampshire, Cambridge, Severn Trent, Southern, Yorkshire
Water – capital expenditure	South West, Wessex, Yorkshire	Dŵr Cymru, Folkestone & Dover, Severn Trent
Sewerage – operating expenditure	Thames, Yorkshire, Wessex	Severn Trent
Sewerage – capital expenditure	Severn Trent	Dŵr Cymru, Wessex

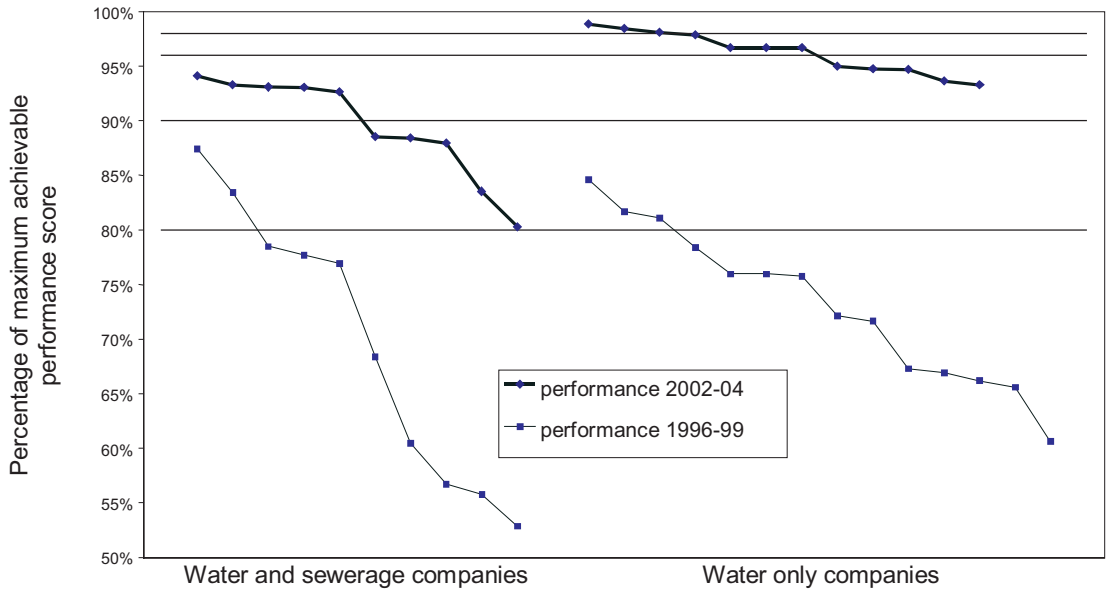
10.10 Improving performance – the OPA rewards and penalties

We set out our general approach to service performance adjustments in 'Linking service levels to prices' (February 2002).

- The OPA price adjustment is intended to be a comparative incentive mechanism, although there is an element of measurement against absolute performance to provide a degree of predictability for each company's score.
- For this price review the adjustments are based on companies' OPA performance in the years 2002-03 and 2003-04.
- The one-off adjustment is applied to the first year of price limits after all other decisions on price limits are made.
- The range of adjustments is between +0.5% and -1.0%, using a graduated scale.
- We have rewarded (or penalised) companies who are significantly better (or worse) than the rest, whilst not making artificial distinctions between companies where performance is close.

At the last price review, companies' OPA performance covered a large range of scores and the 'best' and 'worst' companies could be clearly defined. At this review, company performance has improved considerably, with companies' scores converging towards the maximum. Figure 12 shows both the earlier percentage performance scores of the companies and the current position.

Figure 12 Comparison of overall performance assessment as a percentage of maximum achievable score



In light of the much-improved position, we have decided at this review to revise our approach to take account of the high level of absolute performance whilst retaining the comparative assessment.

We have used a percentage of the maximum achievable score to take account of the absolute level of performance. (The percentage of maximum score is calculated by dividing a company's OPA score by the maximum possible OPA score.) We believe that it is reasonable to expect the water and sewerage companies to be assessed in the same way as the water only companies. We have reflected this by using the same performance bands for all companies. Adjustments are graduated within these absolute performance bands and combined with a comparative assessment, which is added to strengthen incentives on those companies which are significantly better or worse. This is set out below.

- Within the 90% to 100% performance band, potential adjustments range from 0.1% to 0.5%, including an additional positive adjustment for any companies that are significantly better than the rest.

- For the performance band between 90% and 70%, potential adjustments range from 0 to -0.5%, with negative adjustments only applied to companies that are significantly worse than the rest.

- For performance below 70% we could make negative adjustments between -0.5% and -1.0%. However, no companies fall into this band.

- Significant difference is determined as more than one standard deviation from the mean average performance.

We have set graduated scales to recognise that improvements to very high scores are difficult and should be rewarded accordingly, but also that low performance is unacceptable and, hence, the consequent penalties are worse.

Some representations made suggestions about future OPA incentives. These will be useful when we consult on whether the period between price reviews should be changed for the next review and any resulting impact on the use of the OPA. Meanwhile, it should not be assumed that the bands used for this price review will apply in the future.

In their representations, three companies challenged our view that it is fair to compare water and sewerage companies on the same performance scale as water only companies. We have considered these comments and the operation of the OPA methodology and are satisfied that our assessment is fair.

The water and sewerage companies are assessed against more measures than the water only companies, reflecting the wider range of services they provide. Allowances are made in their price limits to deliver all those services. However, the OPA methodology has been set up in a way that means that it is not inherently harder for the water and sewerage companies to achieve the higher performance levels. For example:

- the comparative data ranges for the water and sewerage company OPA measures are based on past performance;

- where appropriate, some of these performance ranges allow for a low level of failure. For example, a company with a small number of properties affected by unplanned interruptions to supply would still score the highest possible score in this measure. In other words, perfection is not required to achieve high scores; and

- the measures have all been set after extensive consultation to broadly reflect the elements of performance that are within the companies' control. For example, we take severe weather into account before assessing flooding caused by overloaded sewers.

Some companies questioned why we had not used the full range of potential price adjustments. We did not do this because the range of company performance does not merit using a wider range of adjustments.

The price adjustments that follow are unchanged from those included in our draft determinations.

Overall, we have applied a range of adjustments from +0.4 to -0.1. The adjustments are described in more detail in table 25.

Table 25 Adjustments to price limits to reflect overall performance

Performance band (percentage of maximum achievable overall performance score)	Adjustment to K factors in 2005-06	Company
>98% and significantly higher than average	0.4	South Staffordshire, Tendring Hundred
>98% and within average	0.3	Folkestone & Dover, Portsmouth
>96%	0.2	Bristol, Cambridge, South East
>90%	0.1	Anglian, Dŵr Cymru, Severn Trent, Wessex, Yorkshire, Bournemouth & W Hampshire, Dee Valley, Mid Kent, Sutton & East Surrey, Three Valleys
<90% and within average	0	Northumbrian, Southern, Thames
<90% and significantly lower than average	-0.1	South West, United Utilities

11. Maintaining service to customers

- Even after the efficiency improvements, total operating costs are forecast to increase by 7% by 2009-10 due to rising costs faced by the companies.
- Our assessment of serviceability to customers is 'stable', except for sewage treatment which we assess as 'marginal'.
- We have assumed an increase of 22% to the level of capital maintenance expenditure, compared with that assumed at the price review in 1999.
- The risk-based approach taken by companies to assessing capital maintenance requirements under the common framework is developing and should improve for the next review in 2009.
- The infrastructure renewals charge and depreciation charges assumed in our price limits have increased, reflecting the growing capital programme.

We expect companies to maintain current levels of service and compliance. They should devote sufficient resources to maintaining their assets now to ensure that they can deliver the same level of service in the future.

In setting price limits we have reviewed the likely costs to companies of maintaining the network of assets. These costs have two elements: the day-to-day operating costs of delivering services to customers; and the capital costs of maintaining the assets, both above and below ground.

Our analysis involves:

- examining trends in service to customers to determine whether they have been maintained;
- assessing the operating costs needed to meet service level expectations, taking account of the scope for efficiency improvements; and
- assessing the expenditure and charges for capital maintenance needed to meet the service level expectations, which reflect both the scope for efficiency improvements and risk to service, and also takes account of the quality improvement programmes.

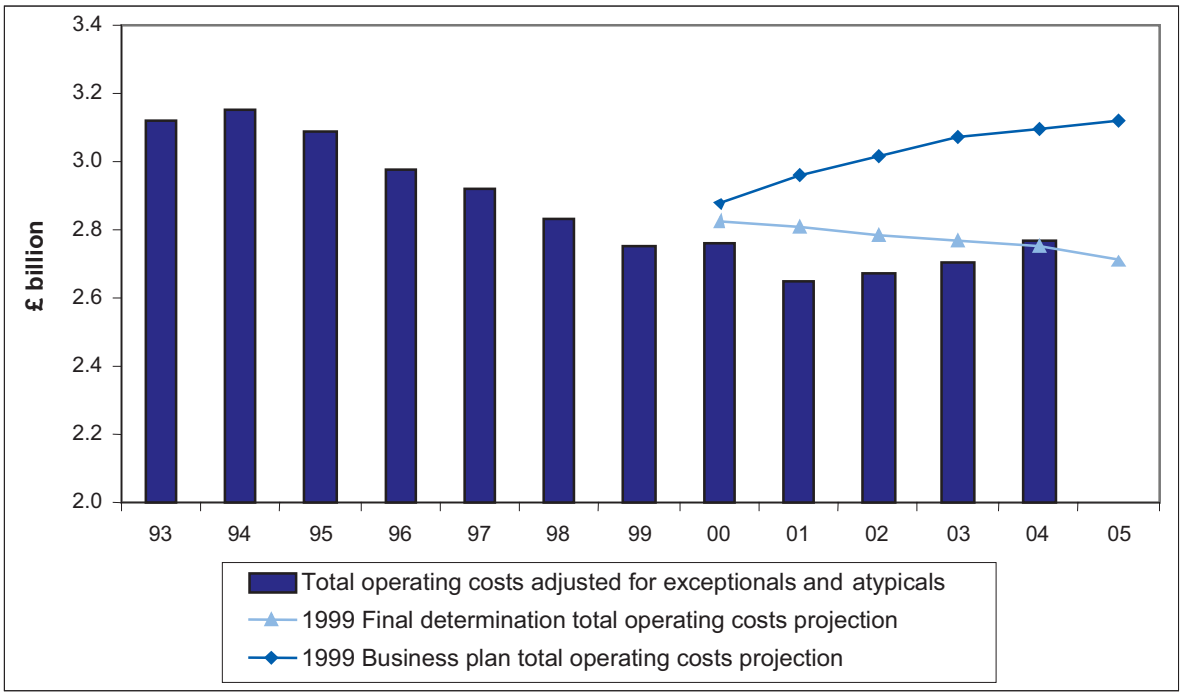
11.1 Operating expenditure for 2005-10

Our starting point for future base operating costs is the company's total operating expenditure for 2003-04. The trends in operating expenditure in recent years are shown in figure 13, together with the projections we assumed in price limits in 1999 and those of the companies from their 1999 business plans. This shows that since 1999 the industry has continued to outperform, but that by 2003-04, actual operating costs are broadly similar to those we assumed.

Some companies have argued that by ignoring some of their claims for additional allowances for rising costs we were effectively increasing our efficiency assumptions. This is not the

case. By using companies' actual 2003-04 costs as the starting point in 2005-06, without making any efficiency assumptions for 2004-05, we ensure that the costs of running the business now are the base for future price limits. In addition, we have made realistic assumptions on new or changing future costs. Where there is uncertainty we have established appropriate correction mechanisms.

Figure 13 Water and sewerage industry – operating costs 1993-2005



All companies have proposed increases in price limits to cover the additional costs which they believe will materialise in 2005-10 and will not be reflected in the RPI adjustment. These include a wide range of costs; the most significant items for the industry are set out below.

- Pension costs. Companies asked us to take account of the need to increase contribution rates and in some cases make up deficits in their pension schemes.

- Energy costs. Proportionate to its size the water industry is a large and growing user of power, particularly electricity. Wholesale energy prices are expected to rise significantly in the next two to three years.

- Customer debt. The ban on disconnecting household customers for non-payment of bills has increased the costs of bad debt and debt management for some companies since 1999. Nearly all companies suggested that the cost of bad debt and debt management will increase further to take account of the higher bills arising from price limits.

- Non-domestic rates. From 2005 the Government will assess the non-domestic rate for water distribution on a new basis. This will mean significant changes in rates bills for some companies.

- Landfill Tax. Most water and sewerage companies use landfill to dispose of waste from water and sewage treatment and some have asked us to make an allowance for the taxes that were recently introduced.

- Environment Agency abstraction licensing. The Environment Agency has consulted on a new regime for charging for water abstraction, which includes paying compensation for loss of abstraction rights. The companies believe that there will be a significant increase in costs as a result, and that, as in the past, Environment Agency unit charges will increase above general inflation.

Our approach to each of these items is set out below.

Pensions

Most water companies operate 'final salary' pension schemes for their employees although some companies have decided not to offer these to new employees. The benefits of these schemes do not relate directly to the contributions made but to length of service and employees' salaries at retirement.

At the 1999 review, we assumed that companies' contributions to pension funds were broadly in equilibrium. One or two companies had pension fund surpluses when we set prices and they stated that they would be taking pension contribution holidays. We recognised this in the price limits for those companies. In other cases companies began pension contributions holidays after price limits were set having received appropriate actuarial advice. But most companies continued making contributions at the 1998-99 level implicit in price limits. When, in the early part of this price review period, the serious decline in the value of pension schemes, particularly final salary ones, became apparent, companies responded in a number of ways based on the advice of their actuaries and the decisions of the pension funds' trustees.

In our methodology paper, we set out that companies' pension arrangements are a matter for their management but in setting price limits we need to enable efficiently managed companies to finance their functions. This includes the cost of providing pensions as part of their remuneration arrangements.

We asked Europe Economics to assess how the general pensions deficit might affect RPI. Europe Economics advised us that the changes would not have any material impact on RPI because of the way in which the economy is managed. The response to the pension deficit and its causes (including poor stock-market performance) is probably more likely to be deflationary. In a competitive business environment raising prices to fund a pension deficit may not be an option and the burden would fall on the companies, their shareholders and employees.

Nonetheless, the volatility of capital markets in recent years coupled with demographic changes have had an impact on the economics of pension provision. This is not confined to the water industry, nor even to the UK economy itself. These changes may be long term and we will not see their final effect for some time. This does not sit easily with the regulatory cycle.

For our determinations we have included increased allowances for pensions where we are satisfied that the companies' proposals are soundly based. Companies that began to recognise the need to address pension scheme deficits through increased pension costs in the base year for this review (2003-04) or earlier, rather than wait until price limits were set, could generally demonstrate a more robust basis for their proposals. In addition, some companies considered that a proportion of the existing pension scheme deficits would be

recovered over time. We have assumed that this approach could be adopted by all companies. We have also checked that the periods over which deficits are being recovered are appropriate.

We have also taken account of the increase in future pension contributions when we have assessed relative efficiency. By doing this we ensure that the most prudent companies, who have managed their funds to avoid a deficit, are not disadvantaged.

Companies' business plans suggest that the annual costs of pensions would have increased by £74 million by 2009-10 – an increase of 2.6% on base operating costs. In their representations on our draft determinations the companies presented new arguments and provided new information on pensions. We have taken these into account in our final price limits. New information in company representations has increased this to £79 million by 2009-10 – an increase of 2.8% on base operating costs.

We have not made any allowance for the Government's proposed pensions protection levy, because we understand that this will be offset by the relaxation of administrative requirements for pension schemes.

Energy

Having considered companies' proposals on future energy costs, the conclusions of the consultants commissioned by Water UK and current market evidence, we have taken the view that wholesale energy costs will rise by around 40% over the next two years. We have increased operating expenditure allowed in final price limits to take account of this. However, it is clear that the general rise in electricity costs will feed into higher RPI figures, providing a benefit to water companies. Accordingly, we have adjusted the operating expenditure allowed down by an amount equivalent to the RPI benefit of around 0.5%.

In their representations companies told us that their initial view on potential increases in energy costs had been overtaken by events. They provided evidence that although our 30% assumption, included in draft determinations, was reasonable earlier in the year, energy increases are already rising at a faster rate. A few companies did not understand our approach to RPI and power costs and others thought that we should have taken explicit account of the time lag between costs rising and RPI increasing. Some companies thought that our assumption of a 0.5% impact on RPI was too high. We have kept our 0.5% RPI assumption, but have taken the view that it is appropriate to make an allowance for a 40% increase in energy costs taking account of the evidence received since our draft determinations.

Customer debt

Companies' proposals for increases in future bad debt costs were typically based on an increase in the overall bad debt charge in line with bills (to reflect current debtors owing higher amounts); an increase in debt management costs (to limit further increases in the levels of bad debt), or a combination of both. However, not all companies requested increases beyond 2003-04 levels.

No allowance for increased bad debt costs was included in our draft price limits because of the uncertainty inherent in calculating allowances that may then not subsequently occur. Additionally, data analysis showed that debt levels were not rising by the same degree in every company and the need to maintain incentives on the companies to be efficient and cost effective in their debt recovery activities also influenced our decision. We did, however, propose to retain the one-way notified item in order to protect companies from material increases in debt related costs.

In their representations on our draft determinations, many companies either argued that we should include an allowance for increases in customer debt to take account of the higher bills arising from the price limits; or expressed concern about the implications of our policy on the financial risks borne by the company and the impact on efficiency targets. However, the extent of concern expressed differed. Some companies made no comments on this decision (including some that had originally requested an increase) and others noted it only in relation to their efficiency targets or financial risks. They also noted that the issue is compounded by the increasing level of indebtedness in society and the low priority placed on water bills. They considered this could worsen with any deterioration in general economic conditions.

A number of stakeholders noted that while bad debt costs are likely to rise, other customers' bills should not be increased to cover these costs.

Companies that commented on the notified item expressed concern that the requirement to show that any increase was a result of the ban on disconnection would be difficult, and that this was not sufficient reason for not awarding increases. Others noted that relying on interim determinations was unwelcome and created uncertainty.

We have considered the issue further, taking into account comments received from companies and stakeholders. We acknowledge concerns that bill increases may result in increased debt levels and/or debt management costs and accept that there is a potential for rises to occur.

Not all companies have reported increases in outstanding revenue or debt management costs within the last 12 months. Of those that have reported increases, for many the rate of increase since 1998-99 has been slowing, and at an industry level some of the key debt measures have stabilised in recent years.

Further analysis was undertaken to look for ways to include an allowance for bad debt which did not allow increases:

- to companies that did not request increases;
- to companies that have not experienced/reported increases in debt since 1998-99;
- to companies that may have seen increased costs as a result of inefficiency; or
- that may not subsequently materialise and therefore could not be recovered – this would not be welcomed by customers.

This included looking at the relationship between bad debt costs (via write-off, bad debt charge, revenue outstanding and debt collection costs) and various measures such as average bills and income deprivation levels. No significant link could be found which could be used to calculate an appropriately robust future allowance.

Additionally, based on research produced for the industry in recent months, we still believe that there is continued scope for companies to further develop and improve their debt management methods. This would use the evidence now being collected, analysed and shared across the industry, especially in relation to long-term debtors. This may include increased use of enforcement methods such as charging orders, more tailored approaches to debt management, early response to changes in payment habits and the development of constructive relationships with debt agencies. It is important to keep the incentive on companies to improve their systems and approaches and to do so in a cost-effective manner.

On balance, we have decided to continue with the existing approach and therefore have not included an allowance for bad debt costs. Base operating costs have, however, been reset at 2003-04 levels and we have revised the wording of the notified item to ensure that a wider range of factors affecting an efficient company can be considered in any interim determination application (see chapter 16). This approach will maintain the incentive for companies to pursue customer debts efficiently, in the interests of both investors and customers. However, we shall maintain a safety valve in the form of a one-way notified item for material increases in household debt-related costs where a company can demonstrate that they are efficient but are required to operate in conditions which are disadvantageous when compared with other service providers.

Non-domestic rates

There is a change to business rates for the water service resulting from the move away from prescribed rates which will take effect in April 2005. We have included the figures as provided to us by the Office of the Deputy Prime Minister (ODPM) and the Welsh Assembly Government in price limits as they are sufficiently firm. The changes mean that some companies will face higher costs for rates while other companies' costs will be lower. We have also included in our final price limits an allowance for the new small business rate relief scheme to be introduced in England in 2005.

A number of companies argued that we should make an allowance for increasing sewerage rates. We have seen no evidence that these increases or decreases are material to price limits and have therefore not made any additional allowance in price limits for them.

Landfill Tax

Our examination of Landfill Tax indicates that most companies intend to take action to avoid the tax by adopting a more sustainable approach. The estimates of the net impact of this tax from those companies seeking an increase are therefore relatively small. Accordingly, we have taken the view that all companies should absorb these costs to the extent that they will be reflected over time in RPI.

Environment Agency and other abstraction/discharge costs

The companies expect the Environment Agency to increase abstraction charges at a faster rate than inflation in future. We have not made any allowance in price limits for Environment Agency charges rising faster than inflation because there is considerable uncertainty about the probability and scale of the increases. However, we have put a notified item in place to protect companies facing material increases in abstraction and discharge costs, as set out in chapter 16. This notified item is wider in scope than the one proposed in our draft price limits, allowing for all changes in abstraction charges rather than ones that solely arise from compensation payments for environmental improvements.

Other costs

For some individual companies we have made specific changes to our assumptions on their operating costs. Some of these relate to cost allocation corrections which have significant impacts on future operating costs, but are offset in other cost categories and hence do not have a significant impact on price limits.

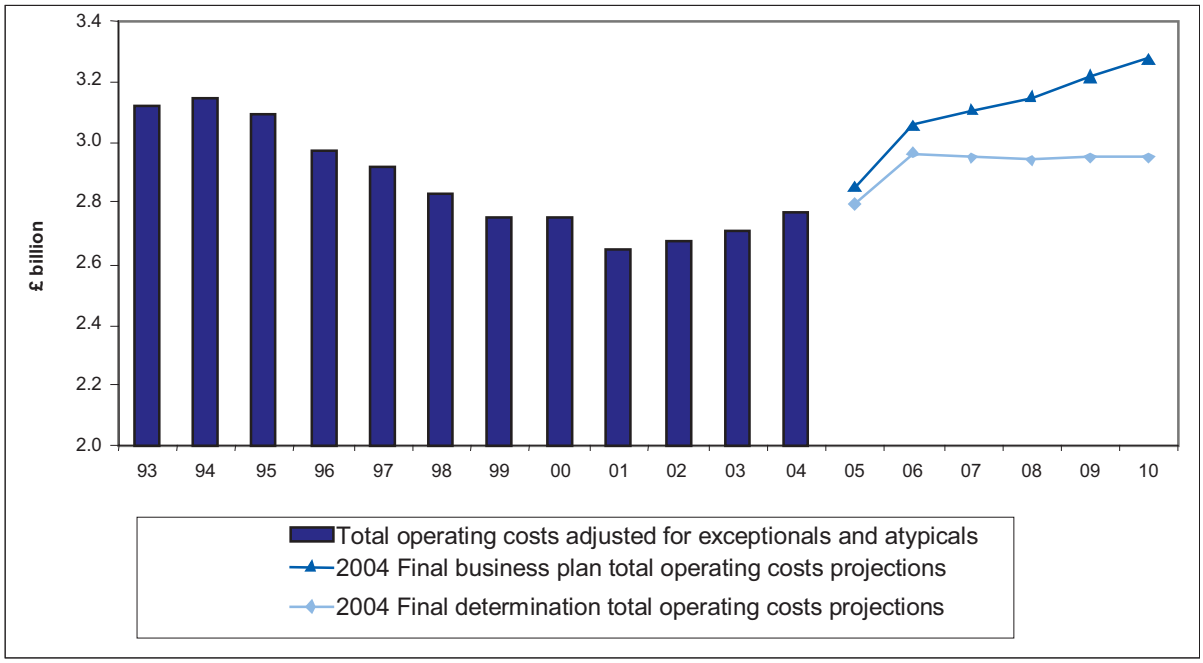
Base operating costs

The companies' total reported operating expenditure for 2003-04 (adjusted for exceptional and atypical items), together with our views on cost increases set out above, have been included in price limits.

We have also made adjustments to correct past cost misallocations. We have also made a number of downward adjustments to the operating (and capital) costs for a number of companies that have been unable to demonstrate arm's length trading with their associate companies, as required by their licences. We have set price limits and considered the scope for future efficiency on the basis of costs that are properly incurred and not those inflated by cross-subsidy.

In summary, our determinations assume that the base operating expenditure needed to deliver services to customers will remain broadly similar in 2010 to its current level. This is a net position after applying our assumptions on the scope for improving efficiency. When the operating expenditure needed to deliver improved quality standards, satisfy demands for more water, and improve customer service standards are included, the total operating expenditure for 2010 represents an increase of 7% compared to the current level. By contrast, companies expected total operating expenditure to rise by 18% including their own assumptions on efficiency. This is shown in figure 14.

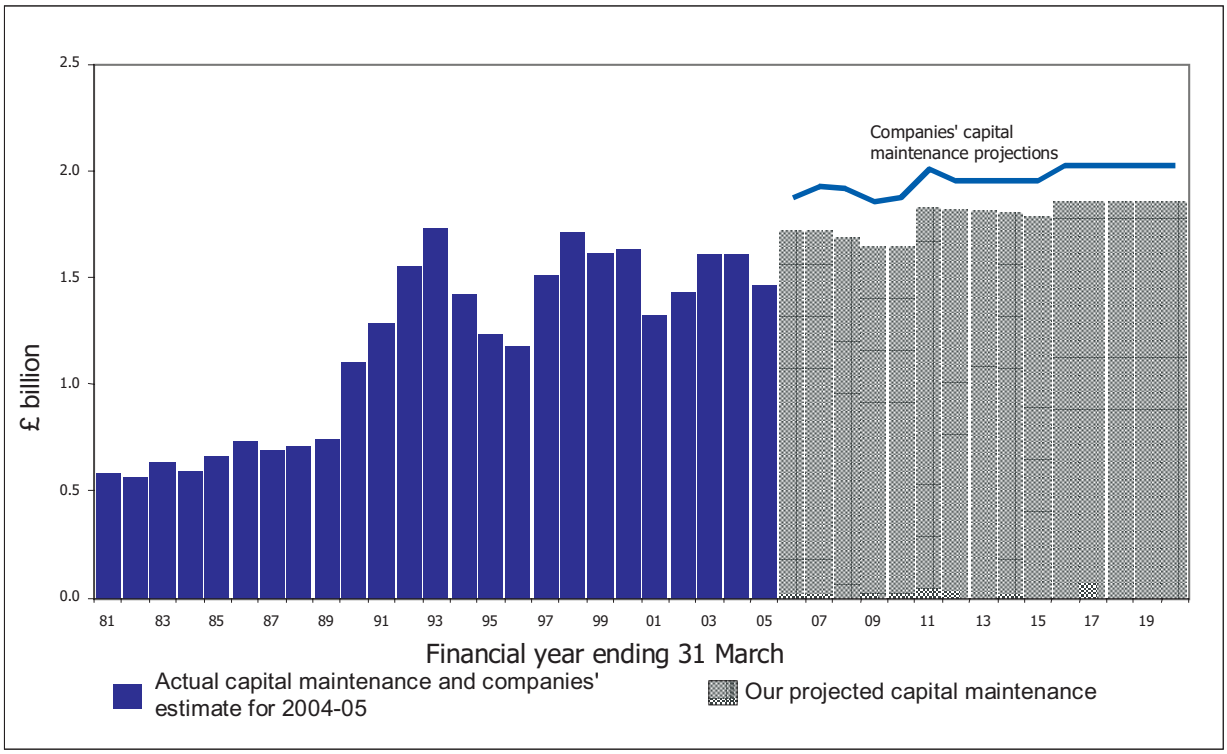
Figure 14 Water and sewerage industry – operating costs performance and projections 1993-2010



11.2 Capital maintenance expenditure for 2005-10 and beyond

Our final price limits assume an increase in capital maintenance expenditure over that allowed at previous price reviews and above the level of investment by the companies in 2000-05. The actual and projected capital maintenance expenditure from 1981 to 2020 is shown in figure 15.

Figure 15 Actual and projected net capital maintenance 1981-2020



The significant improvement programmes implemented since privatisation have involved a higher proportion of short and medium life assets than in the past, for example IT and telemetry systems. This means that assets will have to be replaced more often and many of the short and medium life assets installed during the 1990s will need to be replaced or modernised. Up to April 2004, around £50 billion has been invested since privatisation to maintain systems and deliver higher quality standards and, as the enhancement programme continues, the associated maintenance will continue to rise. The challenge is to invest at the right level and to carry out the work at the right time.

The level of maintenance also needs to deal with non-statutory issues where customers have indicated that the current level of service is unsatisfactory. These issues include the taste and odour of drinking water, nuisance from sewage treatment works, and new sewer flooding incidents.

For some companies the traditional disposal route for sewage sludge to farmland is becoming difficult to maintain and so more expensive sludge disposal options are being introduced.

The overall serviceability assessment for the industry for the water service as a whole and for the below ground sewerage system is stable. We assess above ground sewage treatment related assets to be marginal. Tables 26 and 27 set out our final assessments of water and sewerage serviceability for each company. For companies where the serviceability is assessed to be deteriorating or marginal it may be necessary to increase the base level of maintenance to restore serviceability.

Table 26 Final assessments of water serviceability for 2003-04

	Water infrastructure		Water non-infrastructure	
		Bursts		Water treatment works samples with coliforms
Water and sewerage companies				
Anglian	Stable	•	Improving	☆
Dŵr Cymru	Improving	•	Improving	•
Northumbrian	Stable	•	Stable	•
Severn Trent	Stable	•	Stable	•
South West	Improving	•	Stable	•
Southern	Stable	☆	Stable	•
Thames	Deteriorating	▼	Improving	•
United Utilities	Improving	•	Stable	▼
Wessex	Marginal	•	Improving	•
Yorkshire	Stable	▼	Improving	☆
WaSC assessment	**Stable**		**Stable/improving**	
Water only companies				
Bournemouth & W Hampshire	Stable	☆	Marginal	•
Bristol	Marginal	•	Stable	☆
Cambridge	Stable	•	Stable	☆
Dee Valley	Stable	•	Stable	☆
Folkestone & Dover	Stable	☆	Stable	•
Mid Kent	Stable	•	Stable	•
Portsmouth	Stable	•	Stable	•
South East	Stable	•	Stable	•
South Staffs	Marginal	▼	Stable	•
Sutton & East Surrey	Stable	☆	Stable	•
Tendring Hundred	Stable	☆	Stable	•
Three Valleys	Marginal	▼	Stable	•
WoC assessment	**Stable**		**Stable**	
Industry assessment	**Stable**		**Stable**	

Relative performance over past three years:
☆ = Better than industry average performance by over 50% (25% for bursts).
• = Between +/- 50% (25% for bursts) of industry average performance.
▼ = Worse than industry average performance by over 50% (25% for bursts).

Table 27 Final assessments of sewerage serviceability for 2003-04

	Sewerage infrastructure		Sewerage non-infrastructure	
		Collapses		Sewage treatment works non-compliant
Water and sewerage companies				
Anglian	Deteriorating	•	Marginal	•
Dŵr Cymru	Stable	▼	Stable	•
Northumbrian	Stable	☆	Deteriorating	•
Severn Trent	Stable	•	Stable	•
South West	Marginal	▼	Stable	▼
Southern	Stable	•	Marginal	•
Thames	Marginal	•	Marginal	☆
United Utilities	Stable	•	Stable	•
Wessex	Stable	•	Stable	•
Yorkshire	Stable	•	Deteriorating	•
WaSC assessment	**Stable**		**Marginal**	

Relative performance over past three years:
☆ = Better than industry average performance by over 50%.
• = Between +/- 50% of industry average performance.
▼ = Worse than industry average performance by over 50%.

Capital maintenance – common framework

Since the 1999 price review, the industry has with our support developed a common framework for estimating the future level of capital maintenance required. This was published by UK Water Industry Research Ltd in 'Capital maintenance planning – A common framework'. This common framework uses a forward-looking, risk-based approach to estimate an appropriate level of maintenance for the future. Where a company has clearly demonstrated a comprehensive knowledge of its assets and how it will balance the risk to service in the future, we have generally accepted its approach.

However, many companies are still developing the risk-based aspect of their forward planning at this review. We have assessed the quality of the capital maintenance element of the plan and taken this into account when reaching a view on the appropriate level of investment for the next five years.

Capital maintenance – review of final business plans

Most companies anticipate that they will need to spend more on maintenance in the future than they have in the past. We generally agree, but we believe that there are still opportunities for many companies to manage their asset systems better by procuring more efficiently and providing current serviceability at lower costs than projected in their business plans. Our assumptions for future efficiency improvements are set out in chapter 10.

In coming to our view we have challenged a number of companies on the costs they assumed in preparing their plans. Where we are not satisfied that their costs are reasonable by comparison with the rest of the water industry in England and Wales we have reduced them.

When reviewing companies' business plans we consider their approach at a sub-service level. The water and sewerage services are divided into two categories: infrastructure, which

mostly consists of underground assets; and non-infrastructure, which includes the above ground assets. In total, for the water companies in England and Wales, there are 64 sub-service plans.

Where companies proposed maintaining a stable, or improving level of serviceability at the sub-service level for less than the expenditure allowed for 2000-05, we have accepted their plan as a whole but applied the industry continuing efficiency factor. This happened for 13 out of 64 sub-services. We have made minor adjustments (less than 5%) to a further five sub-services. This does not mean that we fully endorse all aspects of the plans, but that we believe the plan is robust overall and will provide appropriate value for money to the customer, without risking future serviceability.

11.3 The four-stage approach

We have used a four-stage process to assess each sub-service plan.

- Stage A: Maintaining serviceability to customers to date. This stage looks at current serviceability and the trend of past investment to maintain serviceability. We adjust the historic investment to take account of:
  - allocation according to the regulatory accounting guidelines;
  - the typical level of recent investment in capital maintenance at the sub-service level, taking account of recent expenditure, trends and exceptionally large investments which may skew the typical level; and
  - current serviceability and asset performance. Our final assessments take account of the information submitted in the 2004 June return and additional reporting data we have requested. The only change is to the initial assessment for South West's sewerage infrastructure, which moves from deteriorating to marginal, to reflect the improvement recorded in the company's additional reporting information in the June return.
- Stage B: Is the future period different? This looks at how companies believe that their future requirements for capital maintenance will be different. We have advocated using a risk-based approach to estimate how investment may need to change. Our approach in this area is explained in more detail below.
- Stage C: Scope for improvements in efficiency. We assess by how much more companies can improve their efficiency in the future. Our assessment of companies' relative efficiency is set out in tables 21 and 22 in chapter 10.
- Stage D: Impact of the improvement programmes. This takes account of the overlaps between the enhancement programme and capital maintenance.

Assessing stage B

As part of stage B we have assessed the final business plans against 18 criteria. The criteria we use cover the three broad areas of data quality, forward-looking analysis and the approach to outputs.

The plans are then grouped into the following five bands:

- leading (A);
- above intermediate (B);
- intermediate (C);
- below intermediate (D); and
- trailing (E).

When we review the forward looking element of the capital maintenance plan, we initially identify major or exceptional items and assess them separately. A significant change in sludge treatment strategy or the construction of a replacement water treatment works for a small water only company are examples of exceptional items. If the company's proposal is fully justified with robust costs and is supported by the reporter, the exceptional item may be accepted in full. Otherwise the exceptional item is assessed separately and the appropriate challenge on costs or programming applied. This approach is taken so that exceptional items that pass scrutiny may be funded in full even when the sub-service plan is not in the 'leading' band.

Non-exceptional expenditure is adjusted according to a company's banding. A 'leading' company will understand the risk profile of its assets and be able to assess the investment needed to manage this risk in the future. A company assessed as 'trailing' will have failed to demonstrate a robust risk-based approach for future investment in this sub-service. We expect these companies to maintain serviceability for their typical levels of investment, adjusted for current serviceability in stage A and with the appropriate efficiency targets, ie no additional expenditure is assumed at stage B for such companies. However, only one sub-service is assessed as 'trailing'.

Where companies have made a particularly strong (or weak) case for some aspect of future maintenance the banding has been adjusted specifically for this area. An example of this could be a well-researched domestic meter replacement policy within an overall 'intermediate' water non-infrastructure sub-service.

The factors which we apply in stage B to the assessment of future capital maintenance expenditure over and above that required to maintain serviceability are based on the banding of companies discussed above. These factors are set out in table 28.

Table 28 Common framework bandings and associated factors

Company banding	Leading A	Above intermediate B	Intermediate C	Below intermediate D	Trailing E
Factor applied to expenditure (excluding exceptional items)	100%	75%	50%	25%	0%
Number of sub-services assessed in each category (total 64)	5	22	29	7	1

In general, the assessment of the capital maintenance element of business plans showed that the common framework approach was most developed for the water infrastructure sub-service. The non-infrastructure plans were of similar, generally 'intermediate', standard and the sewerage infrastructure plans were of the lowest quality. Only one company, Yorkshire, was constantly leading. The results of our assessments for each sub-service are set out in figure 16.

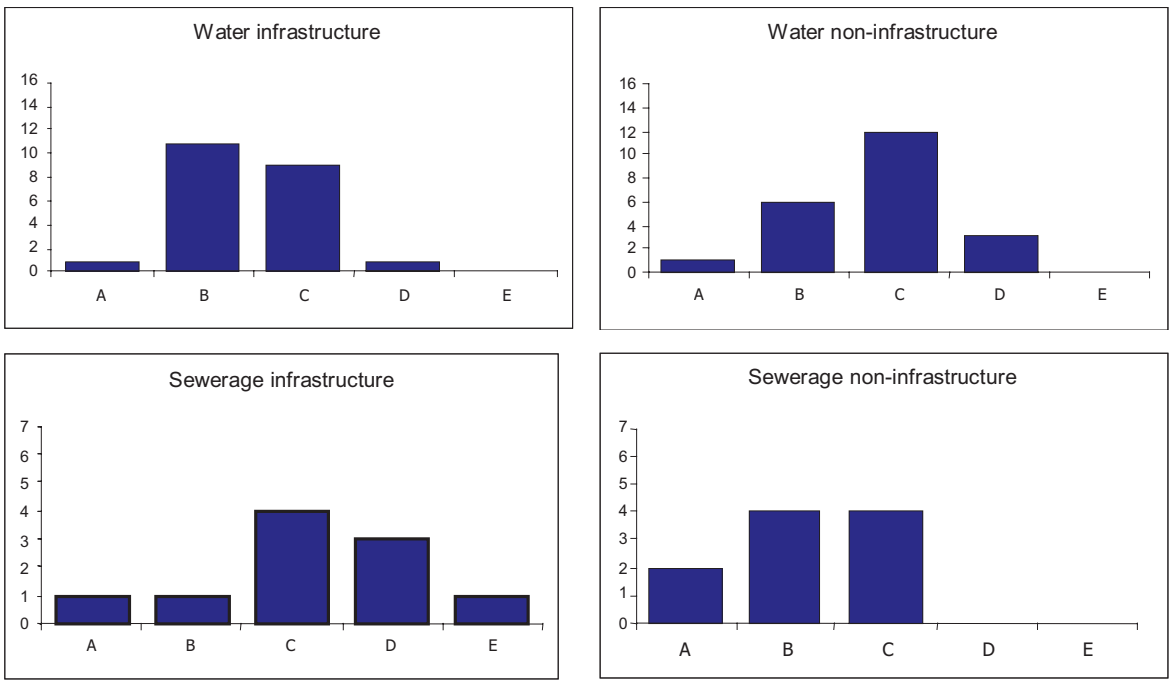
As a result of companies' representations we have reviewed our common framework scoring for the appropriate sub-services. This has resulted in an improvement of one band for 8 out of 64 sub-services.

As the introduction of the common framework is relatively recent it is not surprising that most companies still have some way to go to fully develop a robust risk-based approach across all sub-services.

A number of companies criticised this approach in their representations and stated that the bandings were too coarse. They claimed that coarse bands would result in relatively large changes in the allowed maintenance expenditure as a result of small differences in assessment scores.

It is only the non-exceptional element of the expenditure which companies identify within stage B that is assessed and has the appropriate factor applied to it. This is about 15% of the industry's capital maintenance proposals. We carry out sensitivity analysis on the common framework assessment for each sub-service and assessments close to the boundary of the bands are scrutinised more closely. In general, companies are given the benefit of any doubt and this tends to result in a higher proportion of sub-services in the bottom of a band. One sensitivity analysis shows the effect of narrower bands, using the same factor for the 50% score. The results of this would reduce the overall expenditure allowed for maintenance.

Figure 16 Common framework stage B banding assessment



Stage B assumptions for future periods 2010-20

We expect the risk-based approach for assessing future capital maintenance requirements to be better developed at the price review in 2009. By then we expect companies to have developed their data collection and information processing systems to be able to improve their assessments of the risk of loss of serviceability in the future. We have made an allowance for this, at this review, by assuming that companies will improve their approach by one and a half bands by 2009 compared with our current assessments. This impacts on our stage B assessment for projected expenditure in the period 2010-20.

11.4 Actual and projected capital maintenance expenditure

Overall, we agree that most companies need to increase their level of capital maintenance to ensure that they continue to provide high standards of water and sewerage services, now and in the future. Companies proposed an increase of almost 40% in capital maintenance expenditure for 2005-10 in their final business plans over that assumed at the last review and more than 25% more than they are spending in 2000-05. We have allowed a 22% increase compared with the last review – equivalent to 13% more than companies will spend in 2000-05.

Our assessment of the capital maintenance expenditure allowed in our determination for 2005-10 is included in table 29. This is set out using our four-stage approach. We have also included:

- our expenditure assessment from the last price review;
- the actual and forecast expenditure for the period 2000-05 (AMP3);
- our current estimates of expenditure for the periods 2010-15 (AMP5) and 2015-20 (AMP6); and
- our initial serviceability assessment including data from the companies' performance in 2003-04.

Table 29 Our assessment of capital maintenance expenditure 2005-10

	Industry totals from 2005-06 to 2009-10	Water service		Sewerage service		Total
		Infrastructure £m	Non-infrastructure £m	Infrastructure £m	Non-infrastructure £m	Five-year total £m
	Companies' business plan projections	2,242	2,485	1,144	3,576	9,447
Our assessment of capital maintenance needs						
Stage A	Five years of average expenditure over the period 1992-93 to 2001-02	1,355	2,451	952	2,643	7,401
Stage A	**Stage A** – Our assessment of expenditure required to maintain (and restore where applicable) stable serviceability in 2000-01 to 2004-05	1,422	2,308	982	2,751	7,463
Stage B	Aggregate % uplift assessed as necessary to maintain stable serviceability in 2005-06 to 2009-10 (including exceptional items and early start programme)	35%	7%	12%	24%	19%
Stage B	**Stage B** – Our assessment of expenditure requirements to maintain stable serviceability in 2005-06 to 2009-10 (at current levels of efficiency)	1,917	2,479	1,100	3,399	8,894
Stage C	Aggregate % efficiency factors assumed in our assessment (catch-up and continuing improvement factors)	-6%	-5%	-6%	-6%	-6%
Stage C	**Stage C** – Our assessment of expenditure requirements to maintain stable serviceability in 2005-06 to 2009-10 (after improvements in efficiency)	1,810	2,360	1,032	3,185	8,387
Stage D	The net impact of the enhancement programmes on capital maintenance requirements	58	-4	-4	-27	23
Stage D	**Stage D – Our overall assessment of expenditure to maintain (and restore where applicable) stable serviceability in 2005-06 to 2009-10**	**1,868**	**2,356**	**1,028**	**3,158**	**8,410**
Memo items						
1 Our 1999 assessment of capital maintenance needs for 2000-01 to 2004-05 (AMP3)		1,361	2,288	957	2,280	6,886
2 Actual and forecast capital maintenance expenditure by the companies for 2000-01 to 2004-05 (AMP3)		1,544	2,160	879	2,895	7,477
3 Our initial assessment of serviceability – including data from companies' performance in 2003-04		Stable	Stable	Stable	Marginal	
4 Our current estimate of expenditure for the period 2010-11 to 2014-15 (AMP5)		2,051	2,494	1,088	3,412	9,046
5 Our current estimate of expenditure for the period 2015-16 to 2019-20 (AMP6)		2,102	2,583	1,111	3,468	9,264

Notes:
1 Expenditure is presented in 2002-03 prices and is net of capital contributions.
2 Historical expenditure has been indexed forward to 2002-03 prices using the Retail Price Index average.
3 Numbers may not add up due to rounding.

11.5 Odour and sludge

We have considered expenditure on odour control for existing sewage and sludge treatment sites as capital maintenance. We considered expenditure on odour control at new works as part of the overall quality improvement programme.

A number of water and sewerage companies included substantial odour and nuisance reduction programmes in their business plans. In many cases the outputs were not well defined. In some cases the costs and scope of work were unclear and not fully supported by the reporter.

A non-statutory code of practice for odour control is being prepared by Defra. Recent court judgements may also change the way that local authorities approach complaints of nuisance from sewage treatment works. This may lead to inconsistencies between areas and increased uncertainty for the companies in dealing with sewage treatment.

For this review we have taken the following approach.

- If an odour control project is clearly required, well defined and supported by the reporter we have subjected it to our usual challenges and allowed the appropriate costs. This has tended to apply to major projects such as the odour control proposals for Mogden sewage treatment works which serves part of London.

- For other odour control projects we have allowed 25% of the estimated expenditure in the final business plan. This will allow work to proceed at the most urgent sites. Where calculated, we have allowed for the costs of 'odour modelling'. This is an addition to the odour control work allowed as part of the early start programme.

- No allowance in price limits has been made for any projected expenditure resulting from the requirement to install odour control to comply with the anticipated code of practice and/or future abatement notices.

Water and sewerage companies have identified an increased risk associated with the disposal of sewage sludge to land. Where companies have proposed an alternative approach to sludge treatment and disposal associated expenditure, we have generally assessed this within the stage B part of our four-stage process.

11.6 Infrastructure renewals charges

Infrastructure renewals accounting provides for a charge to be made each year against profits (the infrastructure renewals charge). The difference between the charge against profit and expenditure in a given year gives rise to an accrual or prepayment in the balance sheet, rather than influencing reported profits. Over time the charge and expenditure should balance out. In our price limits, we have assumed an infrastructure renewals charge that is equal to the average level of infrastructure renewals expenditure over the 15-year period, 2000-15. In their business plans, companies' approaches to calculating their infrastructure renewals charges varied.

The majority of companies used our methodology to derive their charge. Some companies assumed a charge equal to the average level of infrastructure renewals expenditure over the five-year period from 2005-10 and one company used a ten-year period to calculate the average. The remaining three companies used other approaches.

Companies' business plans allowed for total infrastructure renewals charges of £3.1 billion over the period 2005-10. We have allowed £2.8 billion in price limits, which reflects our view of infrastructure renewals expenditure up to 2015 – an increase of over 37% compared with the last review. As set out earlier in the chapter, we have assumed an increased understanding of risk by companies in 2010-20 and this will have an impact on infrastructure renewals charges for 2005-10.

We have accepted the cases presented by three companies for prepayments arising from 2000-05 to be utilised and taken into account in setting their infrastructure renewals charges. For these companies, prepayments will be wound out over the ten-year period from 2005-15.

There are other companies whose actual infrastructure renewals expenditure is higher than the amount that we included in price limits in 1999, but we did not consider their case sufficiently strong to adjust their infrastructure renewals charge. For these companies, we have recognised the prepayment that arises from this overspend in their regulatory capital value. Conversely, for those companies who underspent relative to the infrastructure renewals expenditure allowed, we have reduced their regulatory capital value accordingly.

For two companies, a further adjustment has been made to the infrastructure renewals charge to reflect the windout of the remainder of their unused accruals as agreed by us at the last review.

11.7 Current cost depreciation

Conventional current cost depreciation is used to derive the appropriate accounting charge in customers' bills to cover the capital maintenance needs of the above ground assets.

The total current cost depreciation for the period 2005-10 allowed for in price limits is shown in table 18 in chapter 9. This comprises two elements: depreciation on the pool of assets at 31 March 2003 and their maintenance, renewal or replacement; and depreciation on new assets created since that date. The drinking water quality and environmental improvement programmes described in chapter 13 give rise to the need for new assets.

At the 1999 review, we introduced a check on the reasonableness of the overall level of depreciation included in price limits. Over the long term, for a pool of assets that is stable in terms of outputs generated (base service assets), the current cost depreciation charged should be comparable to the capital expenditure required to maintain and replace the assets (maintenance non-infrastructure expenditure). However, in general at the 1999 review the total current cost depreciation over a long period of time was higher than maintenance non-infrastructure expenditure. Where companies did not provide sound explanations for this difference, we made a downward adjustment to the current cost depreciation allowed in price limits.

Most companies accepted this approach in principle but disagreed with what was perceived as a mechanistic application of the adjustment. In our methodology paper, we responded to this feedback, and set out how we had refined the test for the 2004 review to address some of the concerns that companies had raised. We recognised that there may be a number of valid reasons why, over the long term, depreciation may not be broadly the same as maintenance expenditure. It was for companies to explain in their business plans if this was the case and why.

In their business plans, most companies assessed their long-term depreciation charges to be in line with maintenance expenditure. Four companies said this was not the case and they

included an adjustment to their depreciation to correct this. We have appraised and challenged the companies' forecasts and assessed the quality of companies' explanations. We have also compared current cost depreciation on base service assets and our projections for capital maintenance expenditure for all companies. For 14 companies we accept that the projections are now broadly the same and no further adjustment to their current cost depreciation has been made. This is not the case for eight companies and we have made an adjustment to their depreciation charges to ensure alignment.

In our draft determinations, we made adjustments to nine companies' projections. A water only company provided further information after its draft determination and consequently we made no further adjustments for its depreciation charge in the final price limits. In addition, the adjustment for two of the remaining companies was substantially reduced following our examination of new information provided by the companies concerned.

The reassessment of current cost depreciation should not affect the present value of future cash flows as depreciation charges will also affect the regulatory capital value. If current cost depreciation is reduced, the regulatory capital value will be correspondingly higher and remunerated by the return on capital. Hence, only the timing of future revenues is affected, not the overall level of remuneration.

12. Maintaining the balance between supply and demand

- Demand is forecast to be broadly stable at the industry level, but with a more variable pattern between regions and within company boundaries.
- Increased expenditure of £3.1 billion (gross of capital contributions) on supply/demand is included in our determination, reflecting housing growth, work to improve security of supply (particularly in London), increased metering activity and work on sewerage service assets.
- Our challenges have reduced companies' forecast costs (gross of capital contributions) by around £680 million in the water service and more than £300 million in the sewerage service.
- At the industry level, total leakage is expected to reduce by 8.5% (315 Ml/d) by 2010. The security of supplies, as measured by our index, is expected to be maintained or improved by all companies by 2010.

12.1 Aggregate demand

At the industry level demand for water is forecast to remain broadly stable, with a slight decline overall. This masks a more variable regional picture, with significant increases in demand projected for some companies in the South East of England.

Table 30 summarises the forecast changes in water delivered to customers across the industry.

Table 30 Forecast changes in water delivered to customers

Component	Level in 2004-05 Ml/d	Change in Ml/d by 2009-10	% change
Water delivered to households	8,640	138	1.6%
Water delivered to non-households	3,607	-206	-5.7%
Total water delivered	12,247	-67	-0.6%

In setting price limits we have taken account of demand trends at the water resource zone level, as set out by companies in their water resource plans. Much of the investment programme included in our price limits reflects the need to invest in assets to meet changing patterns of demand, rather than growth in demand overall. For the sewerage service, demand is less easily defined but can be viewed as demand for 'effective drainage' and relates to factors such as the increase in hard surface areas. In these terms, sewerage demand reflects changes in housing and population more closely than changes in the clean water delivered to customers.

Table 31 Expenditure to maintain the balance between supply and demand

£ million	Capital expenditure 2005-10	Additional operating expenditure by 2009-10
Water service		
New development	685	8
Growth in demand (excluding optional metering)	672	6
Optional metering	206	8
Enhanced security of supply	613	9
Sub-total	2,176	32
Capital contributions[1]	(477)	–
Net expenditure	1,699	32
Sewerage service		
New development and metering	334	10
Growth in demand	558	7
Sub-total	892	17
Capital contributions[1]	(302)	–
Net expenditure	590	17
Total supply/demand expenditure	**2,289**	**49**

1 Capital contributions includes receipts from infrastructure charges, developer contributions and requisition charges.

The price limits assume that around £3.1 billion investment (or £2.3 billion net of capital contributions) will be needed to enable companies to maintain the balance between supply and demand for water and sewerage services, and in some cases to enhance the security of water supply (see table 31). This expenditure is partially offset by receipts from infrastructure charges and developer contributions. We have also taken into account, in our price limits, the additional revenue gained by companies from new connections (see chapter 14).

This investment represents a significant increase compared with the assumptions made at the 1999 price review. This is due to a number of factors.

- The requirement for a substantial programme of work by Thames to improve security of supply in London.
- Increased investment arising from expectations of house building activity, particularly in the South East of England.
- A higher rate of investment in the sewerage service largely for new or enhanced assets in areas of housing growth, including additional investment to maintain compliance at treatment works and prevent the emergence of further sewer flooding problems.

Our approach to assessing companies' plans

In assessing companies' plans we have applied the principles described in our methodology paper. We have challenged companies to demonstrate that their plans represent the optimal approach to maintaining the balance between supply and demand for their customers. We have also scrutinised companies' work on individual elements of the supply/demand balance, and taken account of reporters' views and those of the Environment Agency. We have checked to ensure that companies' investment proposals in their business plans are consistent with their detailed water resource plans. This means that our analysis takes account of supply/demand balance issues at a water resource zone level, and in relation to peak or 'critical' periods. In general, we expect all companies to maintain target headroom in all water resource zones, or to move to this position by enhancing security of supply.

In the sewerage service we expected companies to adopt a more systematic approach, clearly identifying the least cost investment requirements. We also asked companies to separately identify requirements between sewerage and sewage treatment assets.

We have accepted that supply/demand balance investment is not self-financing in all circumstances. In doing this we have ensured that our approach is even-handed between demand management improvements and those that increase the capacity to deliver water to customers. In common with other types of improvement expenditure we have applied our efficiency challenges as set out in chapter 10.

We have also challenged companies' plans to ensure that the outputs that companies forecast to maintain the supply/demand balance are clearly set out. We have set out in detail for each company the output expectations underlying our determination, often in a project specific format. This detail is set out in the confidential supplementary reports we have provided to companies. This will allow us to monitor companies' progress in delivering asset improvements in line with the long-term planning framework set out in their business and water resource plans. We have not included in our price limits those projects where we consider that the outputs will not result in an improvement in service for customers.

12.2 New development

Companies' business plans forecast that £619 million of investment would be required to improve assets to deliver water services to new customers, and £433 million in the sewerage service. This relates to a forecast of 935,100 new properties to be connected for water services and 889,450 for sewerage services for 2005-10. We have assessed companies' plans and made adjustments where we judged this to be appropriate.

We have also assessed whether companies have allocated costs appropriately to inform our judgements about cost recovery from developers. This is because, for new development, they can recover contributions from developers for a range of works, as set out in the Water Industry Act 1991 (WIA). In some cases companies had allocated asset improvements attributable to new development, and hence recoverable from developers, to other cost categories. In these cases we challenged companies' forecasts, reallocating costs where appropriate. This provides a consistent basis for our judgements about how much of this work companies should seek to finance through contributions from developers.

Our assessment is that £685 million and £334 million will be required respectively for assets attributable to new development in the water and sewerage services. This is similar to the expenditure assumed in the 1999 determination of £1,105 million.

For the sewerage service we have allowed in price limits for new sewers and associated assets required to serve new development. We assume that there will be no deterioration in service overall. We have made an allowance for companies to deal with new problems of sewer flooding arising from new development and increased hard surface areas. Our approach assumes that 60% of forecast additions to the 'at risk of flooding' register are related to supply/demand drivers (new development and growth).

Many companies were pessimistic in their business plans about their ability to recover contributions from developers. They suggested that in the future they would only be able to recover a lower proportion of costs from developers than they have achieved in the recent past. Some companies argued that their ability to recover contributions from developers would be limited by the changes introduced under the Water Act 2003. A number of companies reiterated these concerns in their representations on our draft determinations. Our assessment is that the Water Act 2003 and our revised financial guidance on self-lay, should not materially reduce the legal ability of undertakers to recover contributions from developers. We have found no convincing evidence to suggest that this clarification of the legal regime will prevent undertakers from recovering developer contributions at least in line with our forecasts.

Our assessment in this area suggests that companies have generally secured higher contributions from developers in the past than they are forecasting in their business plans. There are notable disparities between companies' performance in this area, with water only companies, on the whole, securing higher levels of contributions than water and sewerage companies in the water service. This evidence points to significant scope for many companies to secure higher contributions in the future than they forecast in their business plans. In view of the importance of new housing growth in driving the higher expected supply/demand balance costs, we have adjusted companies' expectations of developer contributions where these appeared unduly pessimistic. We have made this adjustment where companies expect to recover less than 60% of our forecast of new development costs (after taking account of continuing and comparative efficiency challenges) for the water service and 50% for the sewerage service. This reduces the financing burden associated with new development which must be borne by other customers.

In light of the representations on our draft determinations our challenges are less demanding for a number of companies. In some cases we have assumed that the companies will rely on provisions in the WIA that allow them to recover the costs of implementing some larger asset improvements from developers who connect to and benefit from these assets within 12 years of their installation. We have taken account of this in our assumptions about the phasing of contributions and have reduced the size of the challenge for 2005-10.

The figures assumed in our final determinations are conservative and take account of the range of performance across the industry now and into the future. We expect all companies to consider carefully their approaches to cost recovery from developers and, if appropriate, to revise their procedures so that they take full account of all of their expenditure that falls within the scope of sections 43 and 100 of the WIA.

Our approach in this area is a development of the approach set out in our methodology paper. It takes more account of the actual performance of companies in recovering costs from developers and places an incentive on them to manage their cost recovery in line with the relevant provisions of the WIA.

12.3 Growth

Growth – water service

We use the growth costs category to assess the costs associated with meeting or managing growth in demand. The costs under the growth driver are generally not recoverable from developers under the WIA. But these costs often reflect the impact of housing growth on the distribution of demand within a company's area. Many companies expect demand to grow in parts of their area, requiring asset improvements, without there being a company-wide increase in demand.

In the water service the growth category includes the costs of enhancing the capacity to deliver water to customers through improvements in water resource or treatment assets and leakage control. We also consider demand management measures under this heading, including selective metering, because it is aimed at managing growth in demand.

Companies forecast the need to invest £1,028 million on growth for 2005-10. Our assessment, following challenge of companies' plans, is £672 million. We have challenged companies' plans where asset improvements do not appear to be required to maintain the supply/demand balance, or are poorly defined. We have also reallocated costs to the new development category where undertakers are able to seek contributions from developers. Our determinations include significant amounts for water resource developments, and asset enhancements to improve the use of existing resources in areas where demand is growing, particularly the South and East of England. We have also allowed in price limits for programmes of selective metering to manage growth in demand.

Growth – sewerage service

We asked companies to split their forecasts of growth costs in the sewerage service between sewerage assets (sewers, pumping stations) and sewage treatment assets. We also asked companies to clearly specify the projects and/or outputs associated with the activity they plan between 2005-10 in this area. We assume that growth costs in the sewerage service arise from pressure on the companies' asset systems that cannot be directly related to new development or relate to assets which are not requisitionable.

Companies' business plans forecast that £289 million of investment would be required to improve sewerage assets, and £488 million to upgrade and expand sewage treatment. Our assessment is £162 million and £396 million respectively for sewerage and sewage treatment asset improvements attributable to growth. This is very much more than the total figure of £226 million assumed in the 1999 determinations.

In the case of sewage treatment, we will monitor companies to check that they deliver asset improvements at the sites included in their business plans, or equivalent outputs. Our price limits assume that the Environment Agency's policy regarding no deterioration in permitted loads will be applied. But where there is growth in flows, we will expect companies to challenge consent revisions that seek to limit total pollution loads to the product of currently consented flows and pollutant concentrations. Companies should ensure that consent revisions required as a result of growth are justified by reference to the environmental quality standards in the receiving water, rather than through a simple pro rata reduction in pollutant concentrations.

12.4 Metering

Companies' forecasts included capital expenditure of £239 million to provide 1.3 million meters on request to customers ('optional' meters), along with an increase in annual operating expenditure of £11 million between 2003-04 and 2009-10. We have challenged six companies' forecasts of the numbers of optional meters, and have reduced the number by around 93,000 meters. (Further details of our optional metering assumptions are set out in chapter 14.) In representations, some companies felt that our assumptions about optional metering will prove to be too low. We acknowledge that it is difficult to forecast the uptake of optional meters, in particular because of the potential impact of rising bills on uptake. Our approach makes use of the statistical evidence available in a pragmatic way to challenge companies' forecasts as central estimates. The symmetrical notified item in this area provides added protection against variations for both the companies and customers (see chapter 16).

We have also adjusted costs to reflect our assessment of the company's relative efficiency in metering, and in those cases where a company's unit costs were not adequately justified. Operating expenditure for metered customers has been subject to a cap of a maximum of £12 per meter, before applying efficiency challenges as for base operating expenditure. This compares with a figure of £8 per meter, set out in RD02/04, for the costs associated with meter reading, billing and account management. Following our scrutiny of companies' forecasts we have assumed capital expenditure of £206 million to provide 1.2 million optional meters in the 2005-10 period, along with an increase in annual operating expenditure of £8 million in 2009-10. We have allowed for the location mix of meters proposed by companies.

A number of companies have also proposed programmes of selective metering, mainly on change of occupancy, to help manage demand for water. Folkestone & Dover proposes seeking water scarce area status during the period. The total cost forecast by companies was £100 million in capital expenditure for 322,000 selective meters during 2005-10, along with an increase in annual operating expenditure of £4 million between 2003-04 and 2009-10. We have included allowances in our price limits for most of the selective metering activity proposed by companies. This represents a step change by comparison with the activity levels expected for 2000-05. Accelerated selective metering will increase meter penetration and the scope for demand management options in the future, in parts of the country where water resources are likely to be under pressure. We have challenged forecast costs in the same way as for optional metering. Our determination assumes capital expenditure of £77 million for almost 354,000 household selective meters, and an increase in annual operating expenditure of £3 million by 2009-10 (included under the heading of 'growth in demand' in table 31). We have also allowed for the impact of companies' selective metering programmes on revenues (see chapter 14).

12.5 Leakage

The actual level of leakage in England and Wales in 2003-04 was 3,650 Ml/d. Our determinations assume a stepped reduction in leakage of 315 Ml/d by 2010, 220 Ml/d of which will be made by Thames. This represents a reduction of 8.6% for the industry. This reduction is in the context of a significant forecast expansion in the numbers of connections served by companies, and an associated increase in the distribution assets of companies.

Our approach to leakage is well established, and is based on an economic assessment of leakage control as part of an integrated strategy to balance supply and demand for water. In

broad terms we expect companies to contain leakage at the level at which it would cost more to make further reductions than to produce the water from another source. This is known as the economic level of leakage (ELL). Operating at the ELL means that the total cost to the customer of supplying water is minimised and companies are operating efficiently. Managing leakage to the economic level, or a proxy for the economic level where this has not been adequately assessed, helps to ensure best value for customers.

We gave detailed guidance to companies on the extent of analysis of ELL that we expected them to set out. We expected them to do this in the context of their overall medium to long-term supply/demand balance. We have assessed companies' work, and generally found their analysis to be of sufficient quality for us to be able to endorse their approaches to the ELL and leakage.

All companies provided an assessment of their long-term ELL in their business plans. These set out their annual assumptions for the period 2005-10. We adjusted the ELL for only one company. The leakage for South Staffordshire in its business plan showed a rising trend. As shown in the table, we have assumed a constant level of leakage over the five-year period.

We made minor amendments to two leakage targets following representations. Sutton & East Surrey highlighted a rounding error which has now been corrected. Folkestone & Dover reassessed the savings it expects to achieve from its metering programme, which we accepted and its targets have been amended accordingly.

The five-year leakage assumptions for each company included for in our price limits are set out in table 32.

Table 32 Leakage assumptions 2005-06 to 2009-10

	Leakage assumptions (Ml/d)				
	2005-06	**2006-07**	**2007-08**	**2008-09**	**2009-10**
Water and sewerage companies					
Anglian	215	215	210	210	210
Dŵr Cymru	225	210	205	195	195
Northumbrian					
Northern operating area	160	155	155	150	150
Southern operating area	69	68	68	67	66
Severn Trent	505	505	505	500	500
South West	84	84	84	84	84
Southern	92	92	92	92	92
Thames	860	805	770	745	725
United Utilities	470	470	465	465	465
Wessex	74	74	74	74	74
Yorkshire	295	295	295	295	295
WaSC total	**3,050**	**2,975**	**2,925**	**2,875**	**2,855**
Water only companies					
Bournemouth & W Hampshire	22	22	22	22	22
Bristol	54	54	54	54	54
Cambridge	14.0	14.0	14.0	14.0	14.0
Dee Valley	11.3	11.2	11.2	11.1	11.0
Folkestone & Dover	8.4	8.3	8.2	8.1	8.0
Mid Kent	28	28	27	27	27
Portsmouth	30	30	30	30	30
South East	69	69	69	69	69
South Staffordshire	75	75	75	75	75
Sutton & East Surrey	25	25	25	25	25
Tendring Hundred	5.1	5.1	5.1	5.1	5.1
Three Valleys	150	145	145	145	140
WoC total	**490**	**485**	**485**	**485**	**480**
Industry total	**3,540**	**3,460**	**3,410**	**3,360**	**3,335**

We will not expect a full review of the ELL before 2007 in preparation for the next price review unless there is a significant change in the nature of the long-term balance between supply and demand. However, all companies are expected to review the economics of leakage each year as best practice dictates, allowing them to manage leakage in response to short-term changes such as unusual weather events. On this basis, we will require an update of the ELL to be submitted in 2007.

Where companies expect to deliver stepped reductions in leakage during 2005-10 we have made assumptions about the required asset or operational improvements as an enhancement of service. More significantly, our price limits assume that each company will, as a minimum, maintain current leakage performance through a combination of capital maintenance and ongoing operating expenditure.

Leakage reduction in London

London experiences the highest leakage levels of anywhere in the country. At the same time, there is also a need to improve the security of supply for customers. Over the past few years we have reported on these issues in our annual reports on security of supply, leakage and the efficient use of water. We regard lowering leakage in London as a key priority as do Thames and many other stakeholders.

Along with the other companies, Thames submitted an updated ELL appraisal with its draft and final business plans, and the company now has targets in place for the period to 2009-10 based on its ELL. The substantial leakage reduction allowed for in the company's price limits combines traditional find and fix leakage work; pressure control; and more than 1,200 km of mains replacement. The level of mains replacement, driven mainly by the need to reduce leakage, is unprecedented. It would usually be considered uneconomic to undertake mains replacement work on this scale.

Thames argued convincingly that a large-scale programme of targeted mains replacement would be economic for many parts of the London network that are worst affected by leakage. It argued that replacing ageing local networks would not only save water, but would also keep maintenance and repair costs down in the future. Emerging evidence from a series of pilot studies carried out by Thames supports this. We require the company to report regularly on its progress, including on any further emerging evidence about the appropriate pace of mains replacement. We have set out detailed output measures, most obviously leakage reductions, associated with the programme included in the final determination. We will make financial adjustments if appropriate in 2009 to reflect variations against these output expectations.

The final determination assumes that Thames will replace mains in 148 local networks (or district metering areas). We have assumed that this will require the installation of more than 1,200 km of new mains between 2005-10, at a total cost of £485 million. In arriving at our assumptions, we have closely challenged Thames' forecast costs, reducing them to reflect the efficiencies they have already delivered in their pilot programme. While our forecast of the total cost of the programme is around £180 million lower than the company's, we believe that there is still significant scope for the company to outperform through greater efficiency in carrying out these works.

12.6 Enhanced security of supply

It is not possible or sensible to eliminate all risk of supply interruptions during extreme events such as droughts, but we do expect companies to reduce this risk to an acceptable level. In their business plans a number of companies forecast the need to invest further in order to improve the security of supply that their assets currently provide. This is because companies believe that customers are currently exposed to a higher than planned risk of supply interruptions in dry years. This is reflected in a deficit against the target headroom (the 'cushion' between dry year distribution input and water available for use) in a given water resource planning zone.

Our determinations assume £613 million in capital expenditure, and an increase of £9 million in annual operating expenditure between 2003-04 and 2009-10, to improve security of supply beyond current levels. We have only included expenditure in this category where it is clearly aimed at enhancing security of supply, rather than normal activity to maintain the current balance between supply and demand.

Our judgements are based on detailed assessments of each company's proposals to ensure that it responds to a clear need for enhancement of security of supply, usually expressed in terms of a deficit against target headroom as reported in their water resource plans. We have also assessed companies' proposals to ensure that they represent the outcome of a logical selection process as part of an integrated supply/demand balance strategy.

Notable improvements in security of supply that are assumed in price limits include:

- a substantial improvement in the security of supply for London, to be delivered by Thames through a combination of resource schemes and leakage reduction in London (as set out in section 12.5 above);

- upgrading water treatment processes to deliver security of supply improvements in Severn Trent's Severn and Birmingham resource zones;

- enhancements to water treatment and distribution by South West in its Colliford and Roadford resource zones;

- water treatment enhancements, water transfers and demand management interventions by Southern in Sussex and the Isle of Wight;

- network improvements, groundwater resources, metering and leakage reduction to deliver significant improvements to security of supply for customers of Folkestone & Dover; and

- network improvements, metering and resource development to improve security of supply across Three Valleys.

13. Quality, environmental and service improvements

- Our price limits include, either in full or in part, most of the quality and environmental schemes included in companies' business plans which received ministerial support.
- We expect improvements at 227 water treatment works and replacement, relining or cleaning of 22,000 km of distribution mains to achieve compliance with drinking water standards.
- We expect cleaner effluent from 1,043 sewage treatment works, and improvements to 2,005 intermittent discharges leading to less pollution of the environment.
- A programme of nearly £1 billion to safeguard homes against the risk of sewer flooding. This would resolve or mitigate every known high-risk problem of internal flooding from overloaded sewers where companies' plans said action is needed by 2010. By then, the proportion of properties at risk would reduce to 0.01% of households.

13.1 Quality and environmental improvements

A considerable proportion of the £17 billion capital investment programme will contribute to preserving or enhancing the environment. Expenditure on capital maintenance discussed in chapter 11 is critical to maintaining existing achievements. This chapter considers the programme of work to deliver the further drinking water quality and environmental improvements that companies are expected to deliver in 2005-10. Our price limits include over 3,900 projects and assume capital expenditure of £5.5 billion to deliver this quality improvement programme.

This programme deals with three key areas:

- improvements to water service assets, to deliver drinking water quality improvements and other obligations;
- alterations to water service assets to alleviate the environmental impact of providing a water service; and
- improvements to sewerage service assets to deliver environmental and other new obligations.

Since submission of companies' final business plans, there have been extensive discussions between Ministers, quality regulators, other stakeholders and ourselves on the appropriate level of quality improvements expected from the water companies. These improvements arise from European and national legislation as well as established and developing Government policy. The companies also need to extend and enhance their asset systems to meet the requirements of current legislation; for example, fitting water treatment plant to reduce nitrate levels as a result of agricultural pollution, and also meeting householders' applications to be connected to the public sewerage system. We are encouraging companies to deliver work which gives multiple benefits.

In the principal guidance from the Secretary of State in March 2004 (and the corresponding guidance from the Welsh Assembly Government), Ministers set out the need for a substantial programme of quality and environmental improvements. In England, Ministers also asked Defra officials to carry out a regulatory impact assessment (RIA), using costs included by the companies in their final business plans, for projects in five policy areas. The final guidance for England (October 2004), confirmed that Ministers wanted this work to proceed following the outcome of the RIA.

Generally, the final guidance confirmed the decisions in the principal guidance from March 2004, with developments in two areas. First, Ministers wished the final programme to take account of work required as a result of further advice given to the companies on the security of the water supply systems. Second, although water companies may be required to carry out work to reduce licensed abstraction to alleviate its impact on the environment, the costs of the replacement water sources should not be included directly in the final price limits. Companies should recover the costs through the compensation route already laid down in the Water Resources Act.

Final guidance for Wales confirmed the programme of work supported in March 2004, along with the security advice and the treatment of changes in abstraction licences outlined above.

The Environment Agency and the DWI gave us their revised views on the quality enhancement programme needed to deliver the ministerial guidance for both England and Wales. An outline of the programmes is given in chapter 8.

We have reviewed companies' plans, and any changes since April. All the proposals that we have included in price limits meet the following criteria:

- they are required by the quality regulators, and confirmed by Ministers, or are new obligations under current legislation;
- they deliver a measurable defined output, which is enforceable;
- they have a clearly defined timetable and due date for delivery in line with regulations or other legislation;
- they have defined asset improvements or changes to operational procedures to deliver the output; and
- they have identified costs for the proposed solution which have been challenged and validated by the company's reporter.

After reviewing the scope of the programme, we also scrutinised and, where appropriate, challenged the companies' costs. Where there was sufficient volume of work across several companies, we reviewed the unit costs of improvements and used our own assumptions for companies whose costs were comparatively high. We have reviewed the cost of ammonia and phosphate removal as well as proposals for first time sewerage and intermittent discharge improvements. We challenged three companies with outlier costs for first time sewerage, one for intermittent discharges and one for phosphate removal. For the latter, we applied our assumptions to both the capital and operating costs.

For other policy areas we found that the outcome of the cost base comparative analysis provided a reasonable comparison to use to challenge and compare companies' costs. We have applied catch-up and continuing efficiencies for both water and sewerage as explained in chapter 10.

Table 33 summarises the capital costs of the quality improvement proposals in companies' business plans alongside our assumptions for price limits. Our assumptions for the quality programme have led to an increase of over £430 million compared with our draft determinations. This change is mainly due to extensive work carried out by the quality regulators and the companies since August to define the work expected and the asset improvements needed to deal with quality problems. More projects now meet our criteria for inclusion in price limits. This table also includes our estimate of an extra £1.5 billion to cover projects or new obligations that may be confirmed or placed on companies before 2010. This is in addition to the £5.5 billion programme included in price limits.

English Nature and the Countryside Council for Wales will be making progress on the review of abstraction licences and discharge consents in line with the Habitats Directive. We expect some improvements to intermittent discharges from the sewerage system in United Utilities to be confirmed as reasonable solutions to environmental problems. Many of the investigations identified for the periods 2000-05 and 2005-10 will be completed and any solutions to alleviate the environmental impacts will need to be implemented promptly. The forthcoming directives for bathing water quality and preliminary work for the Water Framework Directive may lead to work programmes being eligible for inclusion in interim determinations of prices between 2005 and 2010. The actual amount of additional improvement will depend on the timing of new legislation, and the extent of any further work required to meet existing as well as new obligations.

Since the draft determinations we have also reviewed our approach to dealing with the additional costs of operating the new assets resulting from the 2000-05 quality improvement programme. For projects completed towards the end of 2004-05, the full impact of the operating costs will not arise until the beginning of the 2005-10 period. We informed companies of the challenge to their forecasts in 1999. However, some companies believed that we were unduly harsh in applying the 1999 efficiency factors for this work. They believe we should use the efficiency factors assumed for this price review.

We have therefore reviewed these additional operating costs for all companies. Where companies have included additional operating costs for completing the 2000-05 programme we have reviewed these alongside our recalculated profile. We have used the incremental additional operating costs after April 2004, adjusted for any changes due to revisions to the programme by interim determinations, or the logging up/down and shortfalls processes. We applied the 1999 challenge and other efficiency factors for 2004-05, with our new efficiency factors from the start of 2005. Where companies' forecasts were greater than our calculations, we have capped their estimates to our projections. We capped seven companies for the water service and six for the sewerage service. We reviewed the additional operating costs put forward by the smaller water only companies, but did not cap them. The differences are chiefly due to phasing.

Table 33 The capital programme for quality improvements for 2005-10

Drinking water, environmental and other new obligations	Companies' business plans	Our assumptions in final determinations
	Quality capital improvement expenditure (£m)	Quality capital improvement expenditure (£m)
Drinking water – improvements to water treatment works and distribution mains to improve drinking water quality. Also changes to assets to improve security and water supply in emergencies.	2,144	2,066
Environmental impact – dealing with the adverse effects of water abstraction on nature conservation sites and biodiversity	140	34
Improving the impact of the sewerage service on the water environment by: • Carrying out Environment Agency work identified for 2005-10 with ministerial support and other new work identified for 2005-10 • Completing the 2000-05 programme – some projects now have revised outputs and timescales	3,934 559	2,860 888
Policies reviewed by Ministers after the Regulatory Impact Assessment in England: • Consumer acceptability of drinking water • UK Biodiversity Action Plan • Endocrine disrupters research project • Land management projects • Local priority schemes	304	220
Costs before synergies and efficiencies	7,080	6,068
Synergies and efficiencies assumed for 2005-10	(228)	(556)
Current quality improvement programmes – post-efficiency	6,852	5,512
Improvements, most supported by Ministers, where the output is not yet well defined, or appraisal of options to deliver outputs have not been completed – progress estimated in 2005-10		Up to 500
Estimate of other new obligations which may arise during 2005-10		Up to 1,000
Range for possible final quality improvement programme for 2005-10		£5.5 billion to £7 billion

13.2 Drinking water quality improvements and other new obligations

The drinking water quality programme is summarised in table 34. This includes enhancement of treatment works to achieve new standards, or to maintain existing ones where there is a deterioration in the quality of the water abstracted. Companies are also reaching the end of the 20-year programme of work that began at privatisation to deal with discoloured water and the condition of the distribution mains.

We are concerned about the work required to reduce nitrate levels in the public water supply. This does not follow the 'polluter pays' principle, as water companies' customers will be paying for water treatment to remove pollution caused by others. However, this treatment is needed both to meet quality standards and for public health. We are disappointed that it has not been possible for the companies to identify in all cases alternative water sources to blend public water supplies so that this treatment is not required. We welcome the DWI and the Environment Agency's initiative in working with companies to review the options for blending, prior to confirming that these treatment schemes are necessary. Nitrate reduction is an energy intensive process and in most instances blending is a more sustainable option. We hope that, in the longer term, this problem will be controlled by diffuse pollution measures and that replacement of new treatment plants will not be required at the end of their useful life in 20-30 years' time.

The companies are still in the process of considering treatment methods to optimise reductions to lead levels at customers' taps. This is a lengthy and comprehensive process. Once optimisation is achieved, the DWI will be in a position to review and confirm whether additional strategic lead pipe replacement programmes are needed in the latter part of 2005-10. However, any programme of replacing company-owned lead pipes will be expensive and disruptive. Delivering substantial reductions in lead levels will also require customers to replace their lead pipework, at significant cost to individual households. Pipe replacement carried out by companies will only reduce lead levels at the tap to a limited extent unless customers also replace their pipework.

In 1989, most companies started a programme of work to improve the colour and appearance of water at customers' taps. Most companies have now finished this quality-driven mains renovation. The remaining seven companies will be completing their programme of work during 2005-10. In our draft determinations we assumed that three companies with severe pressure on customers' bills at the start of the 2005-10 period would reschedule this work, weighting it towards the end of the period. This would have alleviated the scale of customers' bill increases. The DWI has made strong representations that the later timetable for mains renovation work is not acceptable. We have therefore assumed the original profile for activity. The impact on bills in our final determinations reflect this decision.

Companies included over 350 projects to enhance the water service in their business plans as part of the quality programme. The number of projects required has increased since our draft determinations. Some of these projects are planned to deliver more than one output supported by DWI or Ministers. For individual policy drivers, companies put forward 303 improvements to deal with drinking water quality in their business plans. In our draft determinations we did not include a number of projects because they did not have the technical support of the DWI, or the outputs and activity were insufficiently defined. We have received more information since August and have reconsidered all previously excluded projects against our criteria.

A further 12 projects to deliver improvements to drinking water quality, including four previously considered as maintenance, are included in our final determinations as quality improvement projects.

We have included all the schemes supported by the DWI, either as part of the quality programme, or as part of the companies' maintenance programmes.

We included 76 of the 82 proposals companies included in their plans to enhance the security of their assets. Those excluded had not been fully justified or explained.

We also reconsidered the funding of projects to clean the water distribution system. Where defined cleaning outputs are specified by the DWI to complete the major programme of work to renovate and refurbish the distribution system (started in 1989), we have included both the

costs and the outputs in the quality enhancement programme. Major cleaning and renovation work on trunk mains is needed infrequently and when defined as a discrete project, we believe it is appropriate to include it in the quality programme. The rest of the work on cleaning is considered as part of companies' maintenance plans.

Final ministerial guidance also referred to additional advice given to the companies on security of the water supply network. We have included some additional work and associated costs in our final price limits.

We have allowed for 348 schemes to improve drinking water quality and meet other new obligations in our price limits.

Table 34 What the water quality programme will deliver in 2005-10

Drinking water quality and other new obligations (the policy codes are shown in brackets)	Number of sites	Capital expenditure 2005-10 (net of efficiency) (£m)	Additional operating expenditure by 2009-10 (£m/year)
Water treatment			
Nitrate reduction – to reduce high nitrate levels caused by diffuse pollution present in sources of water used for the drinking water supply (WA1)	75	288	6.0
Plumbosolvency control – conditioning of the water supply so it dissolves less lead from companies' and customers' pipework (WA2)	29	5	0.4
THM reduction – changes to company assets to reduce the level of by-products of disinfection to comply with water quality regulations (WA3)	6	24	1.0
Turbidity reduction – changes to companies' assets to meet the new tighter standard for clarity of drinking water leaving water treatment works (WA4)	21	26	1.0
Cryptosporidium risk reduction – required measures to companies' assets to reduce contamination from Cryptosporidium (WA5)	29	106	2.0
Pesticides treatment – to reduce pesticides levels present in sources of water used for the drinking water supply (WA6)	20	73	2.0
Other – other work supported by DWI at water treatment works (WA7)	59	167	5.0
Water distribution			
Relining activity – reline distribution mains to overcome quality problems as required by s19 undertakings (WA8)	6,436 km	806	0.0
Replacement activity – replace distribution mains to overcome quality problems as required by s19 undertakings (WA9)	6,988 km		
Lead communication pipe replacement – replace companies' pipework, where shown to be necessary to help meet lead standards at customers' taps (WA10)	47,820 (pipes)	24	0.0
Other obligations			
Schemes to improve acceptability of drinking water to consumers (WA11)	31	147	1.1
Other non-statutory improvements to drinking water quality (WA12)	1	<1	0.0
Miscellaneous work and work to improve security and provide emergency supplies of water (WA13, WA15)	82	342	4.0
Subtotal – new work identified for 2005-10		2,008	22.4
Interaction with 2000-05 quality programme			
Projects from 2000-05 completed in 2005-10 (WC1-WC15)	8	6	6.7
Additional projects identified as needed in 2000-05 completed in 2005-10 (WZ1,WZ2)			
Programme for drinking water and other obligations		**2,014**	**29.1**

Totals may not add due to rounding.

We excluded 19 projects as they were:

- not supported by the DWI;
- for cleaning, in part or in total, which is part of maintaining the distribution system, not an improvement (this work has been considered under companies' maintenance programmes);
- proposals such as changes to the drinking water monitoring requirements that we consider are cost-neutral; or
- not adequately justified.

The projects included in our determinations will provide improvements to drinking water quality, meet other new obligations, provide additional security for companies' assets and assist in providing emergency supplies of drinking water.

We have made some adjustments between the 2000-05 and 2005-10 programmes to take account of capital projects with assumed costs of £239 million that were not delivered as expected in 2000-05. Some of these changes are attributable to delays, and there are others where the quality improvements are no longer required or have changed; for example, the focus on work to reduce lead levels by plumbosolvency control, and not by lead pipe replacement. There have been changes to the activity on distribution mains renovation to fulfil s19 undertakings given by companies to the DWI. There is also an additional £87 million of capital expenditure included in price limits for new obligations required from companies in 2000-05 which will be incorporated into bills in 2005-10.

We believe companies can deliver the total drinking water programme for £2 billion capital expenditure and £29.1 million per year additional operating costs by 2009-10. The programme of asset improvements we have assumed is shown in table 35.

Table 35 Drinking water and new obligations – asset improvements assumed in 2005-10

Water service	Final determinations
Water treatment, pumping and storage	
Works to be improved (no.)	227
Water distribution	
Lead communication pipes to be replaced for quality enhancement purposes (no.)	47,820
Mains relined (km)	6,436
Mains replaced (km)	6,988
Mains cleaned (km)	8,874

13.3 Work to deal with the environmental impact of water abstraction

This is a complex area. It is difficult to assess the environmental impact of water abstraction, especially at remote sites and where there are many other variables such as other abstractors, land and drainage management, and the weather. Many of the 218 projects included by companies in their business plans required investigations. We reviewed all the proposals against our criteria.

Final ministerial guidance clarified the legal position of projects which are planned to provide replacement water when licensed abstraction is reduced to alleviate the environmental impact, for nature conservation reasons, or under the Habitats Directive. The impact of the reduction in the volumes permitted to be abstracted from sites will be dealt with through the compensation route specified in the Water Resources Act. This will ensure that all holders of abstraction licences are treated equally. We have therefore not included these projects in our final determinations. We have, however, provided for projects dealing with other aspects of nature conservation, such as fish passes and intake screens to protect fish.

We have only allowed the initial investigation element of some projects and not the costs of the companies' proposals for, as yet, unidentified but possibly more extensive investigations or solutions. We have included 167 investigations/options appraisals and 16 projects in our final price limits.

The remaining investigations and projects did not meet our criteria for inclusion in the quality improvement programme because:

- abstraction licence changes are not supported by final ministerial guidance for inclusion in price limits;
- companies had included projects that are not on the Environment Agency's list of outputs to deliver ministerial guidance;
- the outputs are not the responsibility of the water company;
- the company's proposals are not yet at a suitable level of specification;
- the company's proposals are based on very uncertain costs; or
- the outputs the company is expected to deliver are not adequately defined yet.

The work programme includes 167 investigations/options appraisals, and it is likely that some work on the solutions identified will need to begin before 2010. However, those projects involving replacement water sources will be dealt with through the Water Resources Act mechanisms.

The breakdown of the costs of this programme is given in table 36, and the associated work programme in table 37.

We have made some adjustments between the 2000-05 and 2005-10 programmes to take account of £22 million of capital expenditure assumed for projects that have not been delivered as expected in 2000-05. Some of these changes are attributable to delays, and for others the quality improvements are no longer required or have changed.

Table 36 Environmental obligations affecting the water service

Environmental obligations (the policy codes are shown in brackets)	No. of sites	Capital expenditure 2005-10 (£m)	Additional operating expenditure by 2009-10 (£m/year)
New requirements for 2005-10			
Habitats and Birds – reducing water abstraction affecting the most valuable nature conservation sites and threatened species in the European Union (Hw1-Hw3)	105	28	1.0
Countryside and Rights of Way Act 2000 – reducing water abstraction affecting Sites of Special Scientific Interest (SSSIs) (Iw1-Iw3)	35	4	0.1
UK Biodiversity Action Plan – reducing water abstraction to further the conservation of biodiversity (BAPw1)	25	7	<0.1
Water Framework Directive – work to prepare for implementation of the Directive (WFw1-3)	1	<0.1	0.0
Local Priority – not eligible elsewhere, changes to water abstraction of significant local importance (Lw1-Lw3)	19	5	1.0
Subtotal – new work identified for 2005-10		44	2.1
Interaction with 2000-05 quality programme			
Projects from 2000-05 completed in 2005-10 (WD10)	2	3	0.3
Environmental programme for the water service		47	2.4

Table 37 Water service – work to deliver the environmental programme

Water service	Final determinations outputs
Projects to investigate and alleviate environmental impact	
[1]**Investigations** – to investigate possible impact of water abstraction on the environment (no.)	159
[1]**Option appraisals** – to review the options to mitigate these impacts, including the environmental impacts of potential solutions (no.)	20
Implementation – projects to alleviate the adverse environmental impact of water abstraction (no.)	16
– the volume of replacement water for sustainability purposes these projects will deliver by 2009-10 (Ml/day)	9

[1] Some projects include both an investigation and an option appraisal.

13.4 The quality improvement programme for the sewerage service

For the sewerage service, the quality improvement programme falls into two parts.

- The programme to deliver the policy initiatives in Ministers' guidance for the English companies, and in the corresponding guidance from the Welsh Assembly Government for Wales. These policies have been translated into specific outputs by the Environment Agency with English Nature and the Countryside Council for Wales. They include new obligations placed on the companies since the price review in 1999. For example, the extension of sensitive areas under the Urban Waste Water Treatment Directive.

- Completion of the programme of work confirmed by Ministers in 1999, the majority of which is being delivered by companies in 2000-05.

For many projects the companies have adopted an integrated approach and proposed schemes which address more than one quality related policy area. In a significant number of cases there are also benefits to other areas such as maintenance, improved service to customers or dealing with supply/demand issues.

We have assessed all of the 3,635 projects included by the companies in their business plans, against our criteria. We have included 3,389 of these projects as quality improvements in our price limits, a further 25 have been dealt with under other cost categories.

We excluded some projects from our draft determinations because they did not meet our criteria. Since then, the Environment Agency, English Nature, the Countryside Council for Wales, the companies and other stakeholders have endeavoured to provide the information we needed to include these projects in our price limits. We have reconsidered all the parked projects.

The breakdown by policy driver and associated incremental costs for the sewerage quality improvement programme is shown in table 38. Many of the projects deliver more than one output and therefore the costs shown in the table for these do not represent the stand-alone costs for delivering a specific policy.

We made adjustments of around £590 million between the 2000-05 and 2005-10 programmes to take account of capital projects included at the price review in 1999 that were not delivered as expected in 2000-05. Some of these changes are attributable to delays, for others the quality improvements are no longer required; are uncertain; or have changed. For example, there is continuing uncertainty on the site for the Brighton and Hove sewage treatment works in Southern's area. We have also included £224 million additional capital expenditure in price limits for new obligations that were required from companies in 2000-05 which will be incorporated into bills in 2005-10.

We believe the companies can deliver this programme of 3,389 projects for £3.4 billion compared with the companies' estimate of £4.5 billion for 3,635 projects. A summary of the asset improvements we have assumed in our price limits resulting from this programme is shown in table 39.

We have excluded some projects in policy areas supported by Ministers because they do not meet our criteria. For example projects have been excluded if:

- there is a dispute between the company and the Environment Agency on the output;

- we consider that the company already complies with the requirement;
- the output is not the responsibility of the company;
- the company has not defined the output;
- the reporter has not validated the company's proposal; or
- the proposal is very expensive for the outputs delivered and we expect the company to review the solution they have proposed.

For some projects, we have included only the costs of the investigation stage of the project in price limits rather than the costs of both the investigation and solution. Any solution will be considered once the investigation is complete.

In some cases the Environment Agency has agreed that it is not yet possible to identify a suitable solution and we have included the costs of an investigation in price limits, eg to investigate the impact on water quality of discharges from Knostrop sewage treatment works to the River Aire in Yorkshire. In other cases where we are not satisfied that the companies have examined all the possible solutions we have only included the cost of an investigation or options appraisal. For example, at Davyhulme in Manchester the Environment Agency has requested that United Utilities reduces the number and impact of storm sewage overflows into the Manchester Ship Canal, which are detrimental to the fish population. We believe the company's original proposal, a major civil engineering project to construct large storm tanks, is expensive and offers poor value for customers as well as the environment, at over £100 million, compared with the benefits that might accrue. We would like the company to carry out further investigations on the impact on the fish population and explore other ways of delivering the improvements before embarking on a project that has a significant impact on customers' bills.

The Environment Agency has identified 19 projects included in its original March 2004 list of improvements and also in our draft determinations, where investigations have shown that improvements are not needed to deliver the specified policy drivers.

Since our draft determinations, and in response to stakeholder representations, we have reviewed our approach to dealing with proposals to connect existing properties to the public sewerage system under Section 101A of the Water Industry Act 1991. We have analysed companies' cost estimates, and included what we consider to be an appropriate amount for them to fulfil their obligations. The costs of providing a sewerage service to such properties is borne by the existing customers, and we want to ensure that companies are carrying out their duties in an efficient way. Also, companies are only required to accept this duty if it is the most economic option to deal with an existing environmental or amenity problem. If not, householders are responsible for managing their own drainage arrangements. Where companies have included very expensive proposals (which we have judged as costing more than £41,000 per property) to provide a public sewerage system, we believe companies should review the proposals. We believe that the s101A duty for these high cost projects can be resolved in three ways:

- connection to the public sewerage system – if necessary using innovative technology – eg small bore or vacuum sewerage;
- provision of local treatment facilities, including septic tanks or cesspools serving more than one property – these would be built, operated and maintained by the sewerage undertaker; or
- demonstrating that the undertaker does not have a duty to connect.

Table 38 What the environment quality programme will deliver in 2005-10

Environmental and other new obligations (the policy codes are shown in brackets)	Number of sites	Capital expenditure 2005-10 (£m)	Additional operating expenditure by 2009-10 (£m/year)
Compliance with EU directives			
Urban Waste Water Treatment – upgrades to sewage treatment works to produce cleaner discharges to the environment (U1, U1a, U2, U3, U5)	254	412	18.7
Groundwater – investigations and improvements to treated effluents and intermittent discharges which may affect groundwater (G1-G4)	254	38	0.2
Freshwater Fish – reduction in levels of pollutants, principally ammonia in discharges from sewage treatment works to allow more favourable habitats for fish (F1a-F1b, F3)	127	584	11.6
Bathing Waters – improving sewage treatment works and overflows to assist compliance with European microbiological standards (B1, B2, B4, B6)	99	23	0.1
Shellfish – reduction of microbiological pollution to ensure a suitable environment for shellfish growth (S2, S3)	25	2	0.1
Dangerous Substances – reduction in levels of List I and List II substances in sewage effluents to achieve Environmental Quality Standards (D1, D1a)	4	12	0.1
Habitats and Birds – investigations and improvement in quality of discharges to safeguard the most valuable nature conservation sites and threatened species in the European Union (H1-H8)	241	312	8.2
Integrated Pollution Prevention and Control – changes to assets or operations to comply with new European requirements to limit pollution (IPPC)	14	13	1.1
National legislation			
Countryside and Rights of Way Act 2000 – investigations and improvements to the quality of water affecting sites of special scientific interest (SSSIs) (I0-I6)	123	125	3.4
First-time sewerage – connection of existing properties to the public sewerage system (A14)	171	188	1.1
National policy initiatives			
Chemicals – investigations into the effectiveness of endocrine disrupter removal technologies (C1, C2)	21	26	2.9
UK Biodiversity Action Plan – water quality improvements to meet targets under the UK Biodiversity Action Plan (BAP1- BAP3)	8	11	0.7
Local Priority – improvement schemes that are of significant local importance (L1)	11	30	1.0
Unsatisfactory intermittent discharges – emergency and storm overflows from combined sewers and storm tanks to limit pollution (UID0, UID1)	1,657	558	3.7
Enhanced sewage sludge management – schemes to ensure disposal of sewage sludge in an environmentally sustainable way (SL1 a, b, c)	21	209	8.1
Sustain planned level of environmental protection – improvements needed to ensure continued achievement of obligations largely established at the last price review in 1999 (A4-A13, A15-A19)	38	73	0.7
Miscellaneous (A20, A21, other (Co), SDB early start)	3	15	0.7
Other unsupported cost drivers (various)	46	0.1	0.1
Subtotal – new work identified for 2005-10	**3,117**	**2,631**	**62.5**
Interaction with 2000-05 quality programme			
Completion of work from 2000-05 delayed to 2005-10 (SG1-13, SH3-44)	49	170	
Completion of work identified in 1999 but planned for completion in 2005-10 (SG1-13, SH3-44)	870	225	
Logging up and new 2000-05 projects in 2005-10 (SZ1-11, various)	36	424	
Subtotal – for interaction with 2000-05 quality programme	**955**	**819**	**40.4**
Quality programme for the sewerage service	**4,072**	**3,450**	**102.9**

Table 39 Sewerage service – summary of asset improvements and other work

Sewerage service	Final determination outputs	
Sewerage system		
Number of unsatisfactory intermittent discharges improved	2,005	
Improvement of the sewerage network for environmental reasons:		
– length of new sewers	364 km	
– length of sewers increased in size/capacity	7 km	
Sewage treatment		
Improvements to sewage treatment works or new works	1,043 No.	(serving 21.5m p.e.)
Sludge		
Quantity of sewage sludge companies estimate they will produce per year by 2009-10	1,593 ttds	
Additional annual sewage sludge production by 2009-10 arising from quality improvements	94 ttds	
Investigations		
Number of investigations to assess impact of sewerage service assets and activities on the environment	379	

p.e. – population equivalent served by sewage treatment works
ttds – thousands of tonnes dry solids of sewage sludge

13.5 Regulatory impact assessment (RIA) for England

For England, the Secretary of State's principal guidance asked for work in five policy areas to be subject to a regulatory impact assessment, before she made decisions on work in her final ministerial guidance. The five policy areas were:

- the UK Biodiversity Action Plan;
- a research project on endocrine disrupters;
- land management schemes;
- local priority schemes; and
- for the water service – consumer acceptability of drinking water.

This work is not required under national or European legislation. Defra officials were asked to carry out a RIA on these policy areas. Final ministerial guidance confirmed that specified projects in these policy areas should go ahead.

Companies included costs for 163 projects in the final business plans, but only 120 meet the criteria for consideration in the RIA.

Having received ministerial support, we reviewed each of these projects against our remaining criteria. We included projects in price limits, where they had defined activity, outputs and due dates.

Most of the proposed projects met these criteria. Where they did not, we discussed them with the companies and the quality regulators.

For example, in our draft determinations most of a land management programme put forward by United Utilities did not meet our criteria. There were no clear outputs for these projects. Since our draft determinations we have received more information on these schemes, particularly from the RSPB. We have included in price limits all the work required for the southern area (which includes Dark Peak), and the Bowland Fells area. We believe the additional operating costs associated with the other areas proposed for this research were high, and the estimates were not sufficiently well founded to include in price limits. The work we have included will allow the impact of all the measures on these two areas to be fully monitored and assessed. This will ascertain whether changes in land management do lead to improvements in the condition of upland SSSIs and also the quality of water in downstream watercourses.

The southern area contains the largest area of SSSI land in unfavourable condition, and the Bowland Fells area contains a small area of land in unfavourable condition within a large area of important nature conservation sites. This may help inform the drafting of the programme of measures arising from River Basin Management Plans required under the Water Framework Directive in 2009.The Government strongly supports this work, and therefore we have assumed, when judging what to include in price limits, that the Government will also provide agri-environment grants. This will allow the costs of the work to be shared. It is true investigative work, and it is not possible to specify outputs.

Projects not included are:

- Dambridge – A project in Southern's area to modify the sewage treatment works to lower phosphorus levels in the River Wingham (and contribute to the Biodiversity Action Plan). The costs of the solution proposed by the company significantly outweigh the benefits. Any reduction in abstractions arising from the investigation on low flow may change the balance of the costs and benefits of this proposed project. The Environment Agency is intending to review this scheme when the outcome of the investigation on low flows is complete, and expects the company to review the costs for the proposal. At that point, Defra ministers will be able to decide if the scheme is still required on both technical and cost benefit grounds.

- Etton borehole – This scheme was supported by ministerial guidance, and planned to pump groundwater from Etton borehole (in Anglian's area) to deal with pollution of the aquifer supplying this borehole by a waste disposal site. We believe that in this instance it is inappropriate for water customers to be expected to pay to mitigate the pollution of an aquifer by a third party. The Environment Agency has responsibility for groundwater protection, and it would be inappropriate to impose the costs on Anglian's customers.

- Coniston – An RIA scheme to reduce phosphorus levels in Coniston Water (in United Utilities' area) and contribute to the Biodiversity Action Plan. We have included an investigation, not the full scheme, which is dependent on the outcome of the investigation.

Final price limits include the programme of research to investigate whether sewage effluents can contribute to changes in fish physiology, resulting in disruption of their endocrine systems. We have previously stated that we believe this research should be financed by the Government rather than water companies. In their final guidance, Ministers wanted this work to be included in price limits and paid for by customers. We think that it is essential that complementary work is also carried out by other parties, including where appropriate, the Government, to ascertain the source of any substances entering the sewerage system and to

determine how chemical products, for example, can be formulated to reduce their impact. It is not sustainable for action to be restricted to 'end-of-pipe' energy intensive technology which requires further reductions of concentrations of any active compounds in sewage effluents. As customers are paying for this work, we shall expect that if any new technology developed by the companies leads to export opportunities, the financial benefits should be shared between the customers of the water companies and shareholders.

We have included 109 of the projects in the RIA in the quality programme, in full or in part, in our price limits at a capital cost of £198 million (after efficiencies) and a further 7 projects for dealing with consumer acceptability have been considered as part of the companies' programme of work for maintaining the water distribution system. These are included in the relevant totals and tables in sections 13.4 and 13.5.

13.6 Other service performance improvements

We have scrutinised each of the schemes where companies proposed service improvements. We have looked for clearly defined improvements to service performance levels where customers will see benefits. We have looked at the results from the joint stakeholder market research and any additional research provided to us by the companies to confirm that customers want and are prepared to pay for the proposed improvements. Comments about the schemes, from WaterVoice and other stakeholders, based on their local knowledge, have also been taken into consideration. Finally, we considered the cost effectiveness of the proposed schemes.

In their responses to our draft determinations, many companies and customer representatives expressed concern that too little had been allowed for sewer flooding, which was seen as a key customer priority. In the light of these concerns we have reconsidered our approach to sewer flooding as explained below. However, we still consider that every element of the companies' plans should be scrutinised to ensure that the benefits justify the costs.

At an industry level, our price limits include a total of £0.6 billion for such improvements. Schemes to reduce the number of known sewer flooding problems account for most of this expenditure and our assessment of these schemes is described in detail below.

Sewer flooding

In their business plans, companies proposed making significant progress in dealing with properties known to be at risk of flooding internally at least once in every ten years, due to inadequate capacity in the sewerage system. They also proposed tackling the worst cases of external flooding from sewers. Several companies also proposed reducing the numbers of properties flooding because of blocked sewers and to reduce the impact of flooding where it does occur.

Our assessment has significantly reduced the overall costs of the sewer flooding programme proposed by the companies while preserving the great majority of the benefits for customers. Our final determinations allow companies to provide a capital scheme or measures to reduce the risk or impact of sewer flooding for every known problem identified in companies' plans where overloaded sewers cause repeated internal flooding and where the companies proposed taking action by 2010. In total (after efficiency) we have allowed £970 million (of which £600 million is included as service enhancements and £370 million is included in the capital maintenance and supply and demand programmes) to address the problem of sewer flooding.

This would resolve 9,210 or about 90% of the internal flooding problems proposed in companies' business plans and 6,030 or 80% of external ones. It would do so at around 75% of the cost proposed by the water companies. This reduction in costs reflects the challenge we made to a number of very high cost schemes put forward by the companies. We have also adjusted the forecast numbers and costs of dealing with newly emerging problems.

Our assumptions would deal with 5,360 current problems of internal hydraulic flooding at least once in ten years and 3,850 which are forecast to emerge. Taking account of adjustments we have made to the forecast number of new problems in two companies and that not all emerging problems can be dealt with by 2010, we expect to see around 3,100 properties at risk of internal hydraulic flooding at least once in ten years in 2009-10 (about 0.01% of all properties), compared with about 8,800 in 2004-05. We have also assumed that mitigation measures would be taken to protect a further 4,660 properties from the effects of flooding and that around 3,700 properties would be protected from flooding due to blockages in Thames' area.

Companies' plans varied but included work to deal with new sewer flooding problems which might emerge during the five years to 2010, as well as making significant progress in dealing with problems already identified. New problems will arise for a number of reasons, either because new demands are placed on the sewerage network or because changing rainfall patterns test parts of the system which were previously thought to be adequate. We have assumed that any work needed to deal with emerging problems will be dealt with either through the companies' work to maintain current service levels or through their plans to deal with the impact of growth and new development. We treat dealing with properties already known to flood as a service improvement. We assume that companies will improve efficiency at the same rate as for environmental and supply/demand improvements.

We have assessed companies' projections for the number of new problems expected to emerge. Where these look unrealistic or significantly out of line with the rest of the industry we have challenged the projections. As in our draft determinations we have adjusted costs for some companies, where necessary, to a limit of 125% of the average costs of dealing with those problems that cost less than £120,000 each. This takes account of the possibility of costs increasing in the future.

We accept that sewer flooding is one of the worst service failures that a customer can experience and that rapid progress needs to be made to reduce the impact on customers. However, altering sewerage systems to solve sewer flooding problems can be expensive and we are conscious of the need to ensure that the work proposed offers sufficient benefits to justify the costs. We have therefore commissioned several pieces of work to examine this issue including 'Assessing the benefits of reducing the risk of flooding from sewers' by Colin Green and Theresa Wilson, FHRC (August 2004); 'Survey of customers affected by sewer flooding', Research by Design (August 2004), and have reviewed other evidence where available. We have also taken note of the report on cost-benefit analysis undertaken by Professor David Pearce for the NAO in their report 'Out of sight not out of mind'. This analysis has informed our judgements about the appropriate scale of improvements in the period up to 2010.

We have looked at the companies' proposals for tackling known problems and taken a view on what is most likely to constitute a cost-beneficial programme. Quantifying the benefits of resolving sewer flooding is not clear-cut. However, in our draft determinations, taking account of the evidence available and stakeholders' desire to make progress, we judged that sewer flooding schemes were less likely to be cost-beneficial where the costs exceed £120,000 per property protected. We used this judgement to inform our view about the overall scale of a programme likely to offer reasonable value for money, given what we know about the likely costs of dealing with known problems. We proposed that schemes costing more than this per

property should be subject to further cost-benefit analysis and if found to be worthwhile such schemes would be recognised in subsequent price reviews.

In their responses to our draft determinations, many companies and customer representatives expressed concern that too little had been allowed for sewer flooding. There was also widespread concern that the application of a £120,000 threshold for properties would undermine companies' prioritisation methods and could mean that more expensive but worthwhile schemes would be delayed or not undertaken. Little weight was attached by respondents to our proposal that such expensive schemes might subsequently be logged up after further investigation and cost-benefit analysis. The final guidance from the Secretary of State and the Welsh Assembly Government and reports from various parliamentary select committees also emphasised the importance of making early progress on sewer flooding.

In light of the strength and consistency of views on this issue we have reconsidered our approach. Rather than relying on the logging-up mechanism to fund schemes costing more than £120,000 per problem solved we have decided to include more in price limits at this stage. We have assumed that all expenditure on schemes costing below £120,000 per problem is likely to be cost beneficial, that 70% of expenditure on schemes costing between £120,000 and £250,000 per problem and 40% of expenditure on schemes costing more than £250,000 is likely to be cost beneficial. It is for the companies to take the detailed decisions about individual schemes. We have used these assumptions to decide how much customers should be asked to fund on sewer flooding at this stage and to forecast the numbers of problems which we expect companies to resolve.

There will still be some flooding problems which will not receive a capital solution before 2010. To recognise the position of these customers, we have made allowances for mitigation measures for existing problems where funding for capital schemes is not included in price limits. This is in addition to the mitigation proposals already put forward by four companies and included in our draft determinations. Our final determinations assume that a total of 4,660 properties would receive such protection. This is consistent with the approach set out by the Association of British Insurers in its recent work on flood-resilient homes with the National Flood Forum. This showed that not only can such measures reduce the incidence and extent of flood damage, but they can also reduce the subsequent restoration costs. Price limits therefore now allow for either a capital scheme or measures to reduce the risk or impact of flooding for every currently known high-risk problem due to overloaded sewers which the companies proposed tackling by 2010.

Some companies also proposed reducing the number of flooding incidents due to repeated blockages. Where we are satisfied that there will be a sustained auditable output or improvement in service we have accepted their proposals. Our determinations would allow over 3,700 problems of this sort to be addressed by Thames.

Table 40 summarises the assumptions that we have made in these price limits. It shows the number of hydraulic problems for which a capital scheme has been assumed. The costs shown include allowance for mitigation and flooding due to blocked sewers.

Table 40 Assessment of proposals to reduce risk of flooding from sewers for 2005-10

	Company proposal				Final determinations			
Company	**Internal flooding[1]**	**External flooding**	**Properties at risk of flooding 2009-10**	**Total forecast cost £m[2]**	**Internal flooding[1]**	**External flooding**	**Properties at risk of flooding 2009-10**	**Total likely cost £m[2]**
Anglian	640	1,010	280	90	620	980	300	80
Dŵr Cymru[3]	740	430	20	70	720	430	40	60
Northumbrian	430	90	30	50	390	90	80	40
Severn Trent	1,500	1,070	860	250	990[4]	620	780	150
South West	260	260	130	30	240	250	140	30
Southern	440	540	200	160	400	400	240	100
Thames	4,350	2,940	3,110	520	3,520[4]	2,040	1,020	410
United Utilities[5]	960	460	100	160	1,110	380	120	110
Wessex	850	790	110	90	830	750	130	70
Yorkshire	400	100	220	50	390	90	230	40
Industry total[6]	**10,560**	**7,690**	**5,120**	**1,470**	**9,210**	**6,030**	**3,080**	**1,080**
							Total cost after efficiency improvements	**970**

1 This includes work to tackle existing and forecasts of newly emerging problems.
2 Cost before efficiency adjustments.
3 Includes properties on the DG5 register based on revised data.
4 Adjustments made to forecast numbers of newly emerging problems.
5 Final determination includes 163 projects carried forward from AMP3.
6 Numbers may not add due to rounding.

It is clearly for companies to manage their sewer flooding programmes and we accept that a degree of flexibility is necessary, particularly where new information suggests that particular schemes may be more or less cost-beneficial than previously thought. We expect the companies to keep under review the balance of costs and benefits for all the schemes they propose carrying out. Where they decide that schemes should not progress because they are not cost-beneficial, and cannot find suitable alternative priority projects, we will adjust their programmes to take account of this at the next price review.

We will ask reporters to assess the quality and outcomes of companies' approaches to cost-benefit analysis each year and report their findings to us. We will expect that schemes to deal solely with problems emerging after March 2007 should be subject to rigorous cost-benefit tests. We will work with the industry to develop a database and methodology which can be used to inform decisions during the coming years and for the next price review in 2009. However, we also do not want companies to simply deal with those problems that have the cheapest solutions, as has been the case in the past. We have therefore encouraged every company to develop a prioritisation system so that account is taken of the impact on affected customers. We expect companies to prioritise their investment programmes accordingly, review progress against the prioritised list regularly with WaterVoice, and report to us each year.

We are also actively considering the arrangements for compensating customers for the damage and distress they experience when flooding does occur. The recent Marcic judgement in the House of Lords acknowledged that it was appropriate for us to make a judgement about the costs which it was reasonable for customers generally to pay to address sewer flooding. But the Lords also noted that those customers who were subject to continued flooding should be compensated for the detriment they bore.

We are therefore working with the water industry, the insurers and with customer groups to review existing provisions for insurance and compensation to decide whether they are adequate and, if necessary, how they might be improved. We held a workshop in March this year and have commissioned the survey of flooded customers referred to earlier. This should

establish the costs they incur and the extent to which the damage incurred is currently covered by insurance claims or by the sewerage companies. We will also be reviewing companies' policies and practice on the payment of compensation. The results of these various pieces of work will be discussed again with the industry later this year to establish what, if any, changes to existing arrangements may be appropriate. We expect to consult on a possible way forward in the first half of 2005, but would expect this to have only a small financial impact on companies.

Other service improvements

There were other service improvements included by companies in their business plans. We have allowed for the following in our price limits:

- Dealing with low flow and water pressure at over 19,000 properties supplied by Severn Trent, Southern, Bristol and Cambridge.

- Improving the taste and odour of the drinking water supplied to all 190,000 properties supplied by Bournemouth & West Hampshire, and those supplied from three of Severn Trent's treatment plants.

- Reducing the hardness of drinking water supplied to about 21,000 customers supplied by Severn Trent.

This is in addition to the work the companies will undertake as part of maintaining their assets and improving drinking water quality and the environment.

14. Revenue

- We have challenged companies where we believe that their base revenue forecasts are unduly pessimistic. In aggregate our forecasts for total base revenue in 2005-10 are very close to the companies' proposals. Our assumptions are £69 million (0.4%) higher for the water service and £8 million (0.04%) higher for the sewerage service. However, this masks a more varied picture at the company level.

- Companies forecast a broadly stable revenue base, with the upward influence of a growing customer base offset by the downward impact of increased metering.

- We have assumed that price movements for large users will be related to those experienced by tariff basket customers. Where our view of price increases is lower than a company's, we have also adjusted forecast large user prices to reflect this.

- We have used an econometric model developed by Europe Economics to guide us in assessing companies' forecasts of the uptake of optional meters. We have accepted companies' metering forecasts in the majority of cases.

14.1 Revenue forecasts

Price limits reflect our view of how much current revenues need to change to provide sufficient funds to run the company year on year. In reaching our view, we must first assess the revenue that each company would receive without any change in prices. This takes into account expected changes in demand and the company's customer base. We ask each company to forecast its 'base' revenue for the review period on a 'K=0' basis, that is assuming no change in price limits. If base revenue forecasts are too pessimistic, price limits could be higher than they need to be, so our scrutiny of companies' assumptions is important.

We gave companies detailed guidance on how they should calculate and present their base revenue forecasts, taking account of material influences. In general the companies complied with our guidance and we were able to assess the assumptions they had made.

We have scrutinised the companies' forecasts in some depth, checking for consistency with projections of demand and established trends. Where we found that companies' assumptions were unduly pessimistic we have challenged their forecasts, in line with the policy we set out in our methodology paper.

Table 41 shows forecasts of the industry base revenue we used in setting price limits. These forecasts are shown on a K = 0 basis. Price limits are then calculated to be the change required in the base revenue forecast so that companies recover sufficient revenue to finance their functions.

Table 41 Industry base revenues

	Water service (£m) 2004-05	Water service (£m) Annual % change to 2009-10	Sewerage service (£m) 2004-05	Sewerage service (£m) Annual % change to 2009-10
Household revenues	2,389	0.2	2,615	0.2
Non-household revenues	721	-0.4	720	-1.1
Total tariff basket revenues	**3,109**	**0.0**	**3,335**	**-0.1**
Non-tariff basket revenues	285	0.7	189	0.0
Total revenues	**3,395**	**0.1**	**3,524**	**-1.0**

In broad terms we anticipate that tariff basket revenues, before the application of the overall change in price limits (ie RPI+K), should remain broadly steady in the water service over the period 2005-10. But there would be a small reduction of 0.1% in the sewerage service. This reflects the interaction of a number of factors including:

- the downward impact of optional and selective metering on base revenues;
- growth in the number of properties connected, from 23.0 million to 23.8 million; and
- a small decrease in aggregate demand of 0.6%.

Table 42 sets out the difference between our forecast of base revenue and the forecasts in companies' plans. In aggregate the differences are not large, but this masks a more mixed picture at a company level, where our challenge to companies' figures ranged up to 2.1% of turnover. Taking the five-year period 2005-10, our base revenue forecasts are £69 million higher for the water service and £8 million higher for the sewerage service, 0.4% and 0.04% respectively of total service revenue.

Table 42 Forecast base revenues

£m	Companies' business plans Five-year total	Companies' business plans Annual average	Final determinations Five-year total	Final determinations Annual average
Water service				
Tariff basket revenue	15,495	3,099	15,554	3,111
Non-tariff basket revenue	1,478	296	1,488	298
Sewerage service				
Tariff basket revenue	16,541	3,308	16,629	3,326
Non-tariff basket revenue	1,025	205	945	189

14.2 Measured/unmeasured tariff differential

We expect the difference, on average, between measured and unmeasured household charges to be no greater than the extra costs of providing a metered service. We check this by a calculation called the measured/unmeasured tariff differential (this is set out in more detail in our annual reports on tariff structure and charges). In RD02/04 'Measured/unmeasured tariff differential: Conclusions' we confirmed our intention to modify how we calculate the measured/unmeasured tariff differential, and we gave companies detailed guidance on how to reflect this in their business plans.

The revised tariff differential aims to reflect more accurately the additional costs of measured charging for each company. The revised approach means that, for most companies, measured bills are likely to rise by slightly more than the price limits in 2005-06 and 2006-07, and unmeasured bills will rise by slightly less than the price limits, while the new approach is phased in. We have reflected this in our forecasts of companies' revenues. Thereafter we expect that measured bills will tend to rise, on average, by slightly less than price limits due to the impact of optional metering.

14.3 Impact of metering on revenues

In April 2000, the Government introduced a statutory right to a water meter without charge (called 'optional metering') for household customers. In practice most meter optants are motivated by bill savings, leading to a loss of revenue for companies. Optional metering does not necessarily reduce companies' costs, particularly in the short term, so price limits need to allow companies to make good the lost revenue. As set out in chapter 9, the policy of optional metering leads to bill changes that are greater than the price limit for a 'typical' unmeasured customer (ie a customer whose rateable value is the average for unmeasured customers in 2004-05, and who does not opt for a meter).

Assumptions about the pace, uptake and characteristics of meter optants are important in forecasting a company's revenue. We have therefore paid close attention to companies' assumptions and analysis.

Companies presented forecasts of optional and selective metering as part of their tariff action plans. We continue to believe that the companies should sensibly manage the demand for optional meters, while accepting that the actual uptake of optional meters is difficult to predict. The significant positive price limits in these determinations compound the difficulty in forecasting the extent of optional metering for a number of companies. For this reason we have allowed for a symmetrical notified item for optional metering (see chapter 16). This would not cover changes in selective metering outputs, the risks of which remain with companies between price reviews.

We commissioned work by Europe Economics to examine the available statistical evidence to support forecasts of optional meter uptake. Europe Economics produced econometric models using explanatory variables including real prices, meter penetration, past promotion of optional metering within billing information and the time from when free meters have been offered by the company. We have used this work as a guide in assessing companies' forecasts, having due regard to the uncertainties inherent in this area. As a result we have accepted most companies' metering forecasts. However, we have used different forecasts, drawing upon the modelled values for six companies. Further details of the Europe Economics work is available on our website.

We have also scrutinised companies' assumptions about the characteristics, particularly the demand for water, of meter optants and selectively metered customers. These can have significant impacts on companies' revenues. In most cases companies have presented sound evidence based on current experience and we have accepted their assumptions. We have used our own assumptions about meter optants' demand only in cases where we were not convinced by the evidence presented by companies. In these cases we have assumed that meter optants' pre-switching demand is on average 65% of the unmeasured average, and that they reduce their consumption by an average of 5% following metering. We have also made allowances for the impact of meter under-registration and changes in supply pipe leakage.

In forecasting sewerage revenues we have made adjustments, where appropriate, to ensure consistency between the metering forecasts for the water service and those for the sewerage service. For some sewerage undertakers we have made adjustments to metering forecasts to maintain consistency with the forecasts of water only companies. Table 43 illustrates the forecast numbers of new household meters allowed for in companies' plans, and in our determinations.

Table 43 Household metering forecasts

	Company business plan forecast '000s of meters in 2005-10 (% of unmeasured base)	**Final determination forecast** '000s of meters in 2005-10 (% of unmeasured base)
Optional meters	1,289 (8%)	1,196 (8%)
Selective meters	322 (2%)	354 (2%)

14.4 Non-tariff basket revenues

Non-tariff basket revenue is mainly generated from large users. These customers have a large water consumption that allows them to choose their supplier, so their charges are not subject to price limits. Forecasts of non-tariff basket revenue are important in price setting because they are deducted from the total revenue requirement for tariff basket customers. Lower expectations about non-tariff basket revenue will lead to higher price limits for tariff basket charges, and vice versa.

Our determinations take account of the expected reduction in the tariff basket threshold to 50 Ml/year from 100 Ml/year, as set out in annex 2 of RD19/04. Where this change in the threshold has a material influence on price limits, we have taken this into account in our forecasts.

Many companies have forecast that non-tariff basket revenues will decline due to lower demand and industrial change. We have assessed the evidence presented by companies and made challenges where this was not robust or was inconsistent with established trends. We also assessed companies' assumptions about non-tariff basket charges to ensure that price changes are similar for all customers. A majority of companies agreed with our view that price changes should be similar for all customers, unless bill changes were being driven by factors that were not relevant to large users.

We therefore expect that non-tariff basket customers should also face price increases. We have only allowed for future rebalancing between tariff basket and non-tariff basket customers where evidence supports a compelling case based on improvement in cost

reflective charging. A number of companies argued in their representations on our draft determinations that price increases should be much lower for non-tariff basket customers. These companies argued that the costs of serving non-tariff basket customers will increase much more slowly than those for households and other tariff basket customers. Our assessment of the evidence put forward, however, supported only a much smaller difference between price changes for tariff basket and non-tariff basket customers. We have therefore assumed that non-tariff basket customers for potable water will face price increases of at least three-quarters of those applied through RPI + K to tariff basket customers.

Where our price limits are lower than those proposed by a company, we have adjusted its forecast of non-tariff basket charges to maintain consistency. In a number of cases this means we have reduced forecast charges to a level below those proposed in the company's business plan.

In aggregate our forecast of non-tariff basket revenue is slightly lower than in companies' business plans. This is largely due to the lowering of overall price increases resulting from our scrutiny of companies' plans. This is offset to some extent by challenges to a minority of companies where we judge that their forecasts of revenue recovery are unduly pessimistic.

14.5 Changes in revenue by customer group

The effect of projected movements in base revenues by customer group on their proportion of the total revenue of companies is shown in table 44. The table shows that by 2009-10 there is only a small increase in the proportion of revenues collected from household tariff basket customers, from 69% to 71% for the water service and from 74% to 75% for the sewerage service. However, there is a significant change in the mix of the tariff basket revenue. The overall proportion of revenue from measured household customers increases from 13% to 23% by 2009-10 for the water service and from 15% to 25% for the sewerage service. This reflects the expected expansion of metering across the household customer base. Revenues from non-household customers, both tariff basket and non-tariff basket, reduce slightly overall, reflecting a continuing, albeit small, decline in industrial demand.

Table 44 Changes in revenue between 2002-03 and 2009-10 by customer group

Water service	Forecast proportion of total revenue		Difference
	2002-03	2009-10	2002-03 to 2009-10
Household	**69%**	**71%**	**1%**
Unmeasured	56%	48%	-8%
Measured	13%	23%	10%
Non-household (tariff basket)	**22%**	**21%**	**-1%**
Non-household (non-tariff basket)	**6%**	**6%**	**0%**
Standard tariffs	5%	5%	0%
Non-standard tariffs	1%	1%	0%
Other revenue	**3%**	**3%**	**0%**
Tariff basket	91%	91%	1%
Non-tariff basket	9%	9%	-1%

Sewerage service	Forecast proportion of total revenue		Difference
	2002-03	2009-10	2002-03 to 2009-10
Household	**74%**	**75%**	**1%**
Unmeasured	59%	50%	-9%
Measured	15%	25%	11%
Non-household (tariff basket)	**20%**	**19%**	**-1%**
Non-household (non-tariff basket)	**4%**	**4%**	**0%**
Standard tariffs	4%	4%	0%
Non-standard tariffs	1%	1%	0%
Other revenue	**1%**	**1%**	**0%**
Tariff basket	94%	95%	0%
Non-tariff basket	6%	5%	0%

Numbers may not add due to rounding.

15. Financial issues

- The overall cost of capital assumed is 5.1% on a real, post-tax basis, equivalent to 7.3% on a pre-tax basis.
- We have assumed a pre-tax cost of debt of 4.3% real and a post-tax cost of equity of 7.7% real.
- We have allowed a small company premium on the cost of capital ranging from 0.3% to 0.9% post-tax.
- The financial ratios implied by the price limits should allow companies to maintain access to the capital markets. Increases in price limits for 2007-08 onwards are needed to achieve this.
- The regulatory capital value increases from £35 billion to over £40 billion over the period 2005 to 2010.

15.1 Financing functions

We have a duty to secure that companies are able to finance the proper carrying out of their functions as licenced undertakers ('finance functions'). We look at this as having two strands. One is to secure that, if a company is efficiently managed and financed, it is able to earn a return at least equal to the cost of capital. The second is that its revenues, profits and cash flows must allow it to raise finance on reasonable terms in the capital markets. We refer to this second strand as financeability.

Continuing large capital programmes, such as those included in these price limits, can place a financing strain on the companies and has made our approach to the cost of capital and financeability a critical issue at this review. It is clear that a consequence of requiring companies, even efficient ones, to undertake large capital programmes is persistent negative cash flow. This can lead to a deterioration in credit quality which could restrict the access of companies, despite earning their cost of capital, to capital markets or could significantly increase the cost of finance. This could jeopardise their ability to deliver services and the improvements required. In the assumptions underpinning the price limits, we believe that we have reached an outcome that balances the interests of customers with the need to secure that efficient companies are able to finance their functions.

Debt is at present, other things being equal, a significantly cheaper source of finance than equity. But to rely wholly on debt would risk forcing the whole sector into an unsustainably brittle structure to the ultimate detriment of customers. Accordingly, we believe that our approach to setting price limits should create conditions under which the funding for the additional investment required could come from debt or equity. We believe that the returns allowed provide shareholders with sufficient incentives to provide additional funds, either in the form of retained earnings or new equity injections, to enable companies to make new investment where this is appropriate. Efficient companies should be able to retain stable credit quality going forward.

15.2 The cost of capital

The cost of capital is the minimum return investors will accept for investing in a particular company, taking account of its risk, both absolute and relative to other potential investments. Because it is applied to the entire capital base of each company, it is a highly significant element of the determination of price limits. If the cost of capital is set too low then companies may experience difficulties in financing their investment programmes. If it is set too high, shareholders may earn windfall returns.

The perception of risk in the water industry relative to other investments is a key factor in determining the companies' ability to access finance at reasonable rates. Investors' perception of risk will affect the minimum return that they are willing to accept for investing in the water sector. Business risk in the water industry remains fundamentally low. A survey of investors undertaken on behalf of Water UK (2004) found that, compared with the market as a whole, water is a relatively low risk investment. Nearly 70% of respondents thought the water industry was on a par with or less risky than National Grid Transco and the electricity distribution companies. However, there are some risks that cannot be eliminated. For example, companies' capital programmes are a source of uncertainty, and it is important that we take account of these risks in setting the cost of capital. The size and nature of the funding requirement both past and future is a factor that has influenced our view on an appropriate cost of capital for the water sector.

Overall approach

The cost of capital assumed in price limits was assessed using the approach set out in our methodology paper. We have:

- assumed a single cost of capital for the industry as a whole, with the exception of a premium on the cost of capital for small companies to enable them to maintain access to capital markets;
- used the capital asset pricing model (CAPM) framework, but supplemented this with additional evidence from other sources, including direct evidence from the markets, which we have used to assess the robustness of CAPM derived parameters;
- assumed a consistent capital structure for all companies; and
- set price limits using a company-specific approach to tax rather than assuming a generic tax wedge – this means that customers only pay in their bills the actual level of expected tax.

Companies' views

Water and sewerage companies' estimates of the cost of capital in their final business plans range from 5.0% to 5.5% on a real, post-tax basis. Only one company used the 5.0% figure, which was based on our reference level assumption for the draft business plans. The range for the water only companies is wider at 5.7% to 6.5%; this is principally due to different views on the size of the small company premium required. Appendix 5 sets out companies' views from their final business plans and the views of others in more detail.

A large number of companies relied on a study by National Economic Research Associates (NERA) which was commissioned by Water UK. This was published in August 2003 and

updated in March 2004. Other companies used the NERA study to crosscheck their own estimates.

In its August 2003 report, NERA's best estimate of the real post-tax cost of capital for the water industry as a whole was 5.75% (before the small company premium). This was based on both an analysis of equity market valuations and using the CAPM framework to derive time series and spot estimates of the cost of capital. In this report, NERA suggested that evidence from market valuations pointed to the cost of capital determined at the 1999 review (ie the basic cost of capital of 4.75% before embedded debt premium) as being around 1% too low.

NERA's CAPM estimates, using a time series analysis, resulted in an estimate of 5.79% whilst on a spot basis, using current market rates alone, the figure was 4.86%.

In coming to its best estimate of 5.75%, most weight was given to the time series analysis, which, NERA argued, was more consistent with market valuation data.

In its subsequent report of March 2004, NERA reduced its best estimate of the overall cost of capital to 5.5% on a post-tax basis. The updated report drew on a range of approaches to assess the cost of capital including CAPM, the dividend growth model, market to asset ratios and investor survey evidence.

Water only companies' estimates of the required small company premium varied from 0.54% to 1.00% fully post-tax and were largely based on a separate study carried out by NERA.

Cost of capital used in our determinations

Having reviewed a wide range of evidence, we have concluded that the return required by equity holders has risen since 1999. We have also taken a cautious view of current market data on the cost of debt. By doing this, we have avoided the need to make any allowance for embedded debt. The price limits have been set using a real pre-tax cost of debt of 4.3% and a real post-tax cost of equity of 7.7%.

Combining these gives a weighted average cost of capital (WACC) for the water and sewerage companies of 5.1% in real terms on a post-tax basis. This is equivalent to 7.3% on a pre-tax basis.

We have not changed our assumption on the WACC compared to the draft determinations. In their representations most of the companies continued to argue that this figure is too low, but provided no further evidence. There are a number of factors that affect the share price movements of the listed water stocks, but the overall increase in share prices since publication of our draft determinations partly reflects the ending of a period of uncertainty but also partly reflects the overall reaction from the City. It does not appear to support a position that the allowed cost of capital is too low.

Some commentators argue that the allowances we made for additional revenue for financeability also suggest that the WACC is too low. We do not agree that our overall approach to financeability undermines our assessment of the WACC. Whilst companies remain cash flow negative there will continue to be a strain on the financial ratios that underpin their credit quality. This in turn is driven by the cumulative effect of the capital programme which does not impact uniformly across the companies. Our approach minimises the impact on customers. This is because financeability revenues are back-end loaded, not impacting significantly until 2007-08. For the majority of water only companies, which have much more limited capital programmes, there has been no financeability uplift.

In reaching our final decisions, we have assessed a wide range of evidence. However, there is other evidence, particularly that relating to current rates that would point to a significantly lower assessment. We have also not made the licence modifications proposed in MD189 that would have marginally changed the balance of risk (see chapter 16).

We believe the evidence supports a cost of capital in the range of 4.2% to 5.3% post-tax. Companies need to access a wide range of sources of finance in order to fund their capital programmes and we would not wish to preclude them from doing so. Consequently, we have used a cost of capital towards the high end of the range but not at the top. Our judgement is that a cost of capital of 5.1% (real post-tax) should allow companies to maintain access to the capital markets at reasonable rates and enable the water industry to remain attractive to a diverse range of finance, including equity.

For the water only companies we have included a premium on both the cost of equity and the cost of debt. We have concluded that the total small company premium is skewed more towards equity. The range for the premium is 0.3% to 0.9% on a post-tax basis depending on the size of the company. As signalled in MD190, 'Further guidance to companies for final business plans' (March 2004), we have placed companies in four bands using the regulatory capital value (RCV) as a proxy for the size of company.

For our draft determinations the range for the small company premium was 0.2% to 0.7% post-tax. For our final determinations, our revised assumptions on equity holding periods for the water only companies have resulted in higher equity premiums (and therefore higher overall premiums) for all small companies. Our reasons for change are explained further in section 15.4. We continue to believe that our approach of placing companies into four bands is justified by the variation in costs between water only companies of different sizes, though we have reduced the range of premiums between the three smallest bands.

15.3 Assessing the cost of capital

Assessing the cost of capital is not a mechanical process, in part because it concerns market perceptions about the future. Although modern finance theory provides useful tools, there are still many judgements to be made.

It is apparent that applying the CAPM framework on its own could produce a very wide range for the cost of capital. This arises principally because of an extended period of volatility in the capital markets worldwide and the impact of this on some of the components underlying CAPM, particularly the risk-free rate and equity beta factors. For example, currently beta factors for the listed water companies are around 0.4 – a significant decline since the last review. They were as low as 0.3 in 2002-03. This decline is likely to reflect wider market influences rather than a fundamental change in the business risk faced by the water companies. Another component of CAPM, the equity risk premium, has always been difficult to measure with any precision. In our methodology paper, we recognised that in assessing the cost of capital, it was possible that we would need to supplement a CAPM-based approach using current market data with other techniques and evidence.

At the lower end of the range, the CAPM evidence appears to conflict with market reality, and we have discounted it. This is a similar approach to that taken by Ofgem, which in its March 2004 consultation document on its review of price controls for distribution network operators, proposed a cost of capital range of 4.2% to 5.0% on a post-tax basis. Ofgem's range excluded the bottom of a very wide range "supported by the available data" of 3.0% to 5.0%.

Such volatility in the capital markets means that, in our view, and in the view of our advisers, less reliance than at previous price reviews should be placed on the conventional methods of

assessing the cost of equity such as CAPM. At this review we have therefore assessed a wide range of evidence, to arrive at our view of the cost of capital. This includes evidence from the dividend growth model, market to asset ratios and transaction-based evidence. We have also taken account of analytical work undertaken since the last review, in particular the work undertaken by Smithers & Co Ltd (February 2003) on behalf of us and the other regulators; a study undertaken by OXERA (September 2002) for us on optimal gearing for the water sector; and the work carried out by NERA for Water UK. The volume of evidence is substantial but the conclusions vary. More details of the evidence can be found in appendix 5.

However, we present our assessment of the cost of capital using the CAPM framework to ease comparability with previous reviews and with other regulators.

In setting the cost of capital we have assumed a consistent level of gearing for all companies. In assessing an appropriate gearing range we do not believe that it would be appropriate to be led by the most highly geared companies. In our methodology paper, we said that a range of 55% to 65% gearing would appear sustainable. This level of gearing is consistent with a credit rating that lies comfortably within the investment grade category. We have adjusted companies' opening balance sheets to bring them to the bottom of this range (ie 55%) at March 2005. Industry average gearing for 2003-04 is 59% on the net debt:RCV measure of gearing. Excluding the very highly geared companies this average falls to 51%.

The basis of our assessment

We appointed Cambridge Economic Policy Advisers/Europe Economics (CEPA/EE) in May 2003 to advise us on the appropriate cost of capital for this review. CEPA/EE provided us with an initial view on the likely range for the cost of capital of 4.6% to 5.6% on a real, post-tax basis at the time the companies submitted their draft business plans in August 2003. This provided us with a useful reference point for assessing the significantly higher estimates provided by some companies in their draft business plans. In the draft plans many companies used the original NERA estimate of 5.75% (real post-tax).

In 'Setting water and sewerage price limits for 2005-10: Overview of companies' draft business plans' (October 2003) we said that, on the basis of current evidence, we saw no strong case for setting the basic cost of capital at a level lower than at the last review. We said that this implied a real cost of capital of no lower than 5.0% on a post-tax basis before any small company premium.

We reviewed our early estimates in the light of market evidence leading up to our draft determination of price limits. Our view for each of the component parameters of CAPM suggests an updated range for the cost of capital of 4.2% to 5.3% on a real, post-tax basis as set out in table 45. This remains unchanged from our draft determinations.

Table 45 The range for the cost of capital for the water industry

	Low	High
Gearing (debt:RCV)	55%	55%
Cost of equity		
Risk-free rate	2.5%	3.0%
Equity beta	1.0	1.0
Equity risk premium	4.0%	5.0%
Cost of equity (post-tax)	6.5%	8.0%
Cost of debt		
Risk-free rate	2.5%	3.0%
Debt premium (including transaction costs)	0.8%	1.4%
Cost of debt (gross of tax shield)	3.3%	4.4%
WACC – gross of tax shield	4.7%	6.0%
WACC – post-tax	4.2%	5.3%

The ranges presented in table 45 reflect a consideration of wider market evidence which is summarised in more detail below, together with comments on the individual ranges for the components.

Following publication of our draft determinations, CEPA/EE provided us with their final advice on the cost of capital in late October 2004. On the basis of their review of the CAPM parameters they had previously derived, CEPA/EE concluded that there was no material change in the market data that suggested a need to revise its previous estimate of the WACC.

Risk-free rate

The risk-free rate is the return on an asset which bears no systematic risk at all. UK regulators have generally based risk-free rate estimates on UK government index-linked gilt yields. We have used a range of 2.5% to 3.0%, based on a period average level of yields on medium-term index-linked gilts rather than recent yields which appear historically low. (Real yields on medium maturity index-linked gilts have averaged at just under 2% in the last six months.) However, since our draft determinations, real yields have declined further, albeit very marginally. We do not think this is sufficient to warrant a change to our approach and to simply take account of the current market spot rate would not lead to a sustainable WACC over the medium term.

The proposed range is consistent with regulatory precedent. Recent regulatory determinations have placed little weight on low gilt rates. The Competition Commission, eg BAA plc (2002), has also noted that current yields should be used with caution when estimating the risk-free rate because of market volatility. The Smithers & Co study (February 2003) undertaken on behalf of the regulators concludes that a reasonable assumption for the risk-free rate is 2.5%.

The initial NERA view on the cost of capital of 5.75% was supported by a higher assessment of the real risk-free rate of 3.1%. It used index-linked bonds of other countries denominated in various foreign currencies as a source. Over NERA's time horizon these bonds have shown significantly higher yields than UK index-linked gilts.

Debt premium

The debt spreads on publicly traded debt issued by the water companies are lower than has been typical over recent years. There has been no significant change in debt spreads since our draft determinations. We have used a range of 80 to 140 basis points. Our view,

supported by our advisers, is that the bottom of the range would represent very low borrowing costs. The current very low debt spreads are unlikely to be sustained throughout the next five-year period and there is a much greater risk that spreads will rise over the period than that they will remain unchanged or fall.

Equity betas

In the CAPM framework a company's equity beta factor measures the sensitivity of its share price to movements in share prices in the market as a whole. There are significant difficulties in the interpretation of equity beta values. Time series data shows that equity betas of the listed water companies have been on a downward trend since their initial flotation in 1989. In the early 1990s average betas for the water sector were about 0.9 but they fell steadily to about 0.5 in 1999. They have continued to decline to a low of about 0.3 in 2002-03 although the most recent data suggests they are on an upward trend. Since July 2004 equity betas have averaged just under 0.4. Since our draft determinations, average equity betas have been relatively stable. Taken at face value this would imply that the equity market regards investment in water stocks since the 1999 review as considerably less risky relative to the market than prior to it. Although we have taken steps to reduce regulatory uncertainty, the low beta factors are unlikely to reflect a real decrease in the riskiness of the water sector but are more likely a statistical product of the increase in market volatility. Work undertaken by Smithers & Co Ltd (2004) for Ofgem suggests that, when betas are unstable, regulators may want to give more weight to an expectation of a beta of 1 in their cost of capital assessments. We have used a value of 1 for the geared equity beta. This is a pragmatic approach, but is consistent with that taken by other regulators and the Competition Commission.

Equity risk premium

In the CAPM model, the additional risk associated with equity investments is generally encapsulated in the cost of equity through the equity risk premium. Estimation of this CAPM parameter has always been problematic and confronts major uncertainties. CEPA/EE concluded that the data supports a range of 3.5% to 5% with the very top end of the range being, in their view, more appropriate. They highlight the difficulty in reaching a view on the precise level of the equity risk premium. This issue was also highlighted in the Smithers report which suggested that difficulties in estimating separately the risk-free rate from the equity risk premium are best overcome by examining historic overall equity returns (rather than the individual components). The Smithers study summarises a range of evidence and suggests that equity returns have, over reasonably large samples, been fairly stable over time and across different markets. The report estimates these as 6.5% to 7.5% based on an arithmetic average (but with a wide confidence interval of up to 2%). Our range for the cost of equity is 6.5% to 8%.

In arriving at its best estimate in its March 2004 report, NERA has placed greater emphasis on its estimate of the cost of equity using the dividend growth model. NERA's estimate for the real post-tax cost of equity at 60% gearing using this model is 10% (or 9.7% excluding equity issuance costs of 0.3%). NERA has combined actual dividend yields since the last review (up to 2003) averaging around 7.5% and long-term 'normal' dividend growth rates of 2.2% in computing the cost of equity. This approach will tend to overestimate the cost of equity during a period when yields are higher than the norm. At the time of our draft determinations in August 2004 the current yields of water companies were around 6% or less – this was somewhat lower than the yields underpinning NERA's estimate. At that time some analysts noted that the companies were trading at or close to their regulatory capital values. Yields since our draft determinations have fallen on the back of share price appreciation. As noted earlier, there have been several factors affecting water companies' share prices.

Market evidence that we have taken into account

The Smithers study concluded that at present there is no clear successor to the CAPM model for the practical estimation of the cost of equity. However, we have reviewed the wider market evidence and used the dividend growth model to assess the robustness of any result estimated using the CAPM framework.

Our consultants advised that there are a number of pieces of market evidence that support a cost of equity range higher than straight application of CAPM. This evidence suggests a range for the real post-tax cost of equity of 7.25% to 8.3%. This is higher than our CAPM-derived range. However, as with the application of our CAPM framework, this evidence needs to be carefully weighed and the underlying assumptions tested. Whilst we think that it is important to use this evidence to assess the robustness of CAPM parameters, we do not think that a cost of equity greater than 8.0% is well supported.

Dividend growth model evidence
Whilst NERA's estimate using the dividend growth model in our view overestimates the cost of equity, it is important to crosscheck CAPM derived estimates with other models. Evidence using the dividend growth model suggests that a cost of equity towards the top of the CAPM derived range is appropriate.

Evidence from market asset ratios
Since the last review, the consensus of market analysts has been that the sector has traded consistently below its regulatory capital value, although there has been some increase in the market to asset ratio recently. We have highlighted difficulties in deriving this ratio. It requires separation of the many influences on companies' share prices in order to isolate the regulated water business from the wider group. This is open to significant variation depending on the assumptions made. However, while we believe it is important not to attach spurious accuracy to these ratios, it does show that equity investors' required return may be higher than at the last review.

Share prices in the utilities sector as a whole have also performed strongly since our draft determinations were published in August 2004. Some analysts believe that some water companies are currently trading above their regulatory capital values. The upward trend in share prices does not appear to support a position that the cost of capital allowed at the draft determinations is too low.

Transaction-based evidence
Evidence from corporate transactions since the last review suggests that companies have been valued at or just below their regulatory capital values. This again suggests that a higher cost of equity could be appropriate. Given its size, the recent takeover of South Staffordshire at a significant premium to its regulatory capital value cannot be used to deduce industry-wide trends.

The recent rights issue undertaken by United Utilities provides specific evidence on the cost of equity but it is hard to generalise from the specifics of this deeply discounted transaction.

Equity issuance costs

NERA explicitly added a 0.3% margin to the cost of equity to recover the costs of issuing equity in its study for Water UK.

The overall cost of capital should cover the costs of issuance of total debt and equity over the long term. However, they are only directly incurred at the time of issuance for the specific tranche of finance being raised, and should not be extrapolated across the whole of the

capital base. We do not therefore consider that a specific quantum should be added as a margin. We have assumed a cost of capital towards the higher end of a plausible range and this should cover issuance costs.

Embedded debt

In our assessment of the cost of debt we have placed greater emphasis on longer term historic averages for the risk-free rate and the debt premium. Our cost of capital assumes a cost of debt towards the high end of the range (as shown in table 45). Consequently, the arguments for an embedded debt premium are much weaker. A limited number of companies put forward a case for embedded debt premiums in their final business plans. We have reviewed these. In most cases the evidence did not support such a premium but one company did set out a justification. However, its overall cost of debt in its business plan (including the high coupon fixed rate element) was lower than our assumption. Consequently, we have concluded that no additional premium is required.

15.4 Small company premium

Many companies and stakeholders have argued that there should be a premium to the cost of capital for small companies. There is very little evidence that investors differentiate between the water and sewerage companies in terms of required returns. However, we believe there remains a case for allowing a small premium to the cost of capital for the water only companies.

As we stated in MD190 (March 2004), the 'small company effect' can be analysed in terms of three broad components:

- an equity return premium to compensate for higher trading costs;
- an interest rate premium on the cost of debt finance; and
- premiums on the costs of raising capital (for both debt and equity).

At the 1999 review we allowed a premium to the post-tax cost of capital of 0.75% for most water only companies, while the three largest, Essex & Suffolk (which is now part of Northumbrian), Three Valleys and South East had a lower premium of 0.4%. Given the variation in the size of the water only companies, we believe there is a need for greater differentiation between companies than at the 1999 review. It is difficult, however, to quantify the precise relationship of costs to company size. CEPA/EE suggested differentiation on the basis of RCVs.

On the basis of their 2004-05 regulatory capital values, the water only companies fall into four size bands. At draft determinations we adopted a different premium for each band. We have sought to avoid marginal effects in differentiating between companies and hence the grouping of the water only companies should be clearly delineated. These bandings are set out in table 46, along with our view of the appropriate premium for each band. Some companies argued that the profile of the RCVs over time made the bandings less distinct. Our projected RCVs over this price review period (see section 15.9 and appendix 7) show that the four bands do not become less distinct by 2009-10.

Some water only companies argued against our four-band system in their representations. They point to evidence that a number of costs are no greater for the smallest water only companies than for their larger counterparts. Our view remains, however, that certain fixed

and variable costs, both on debt and equity, have a proportionally larger impact on smaller companies and their investors, and that they should be compensated accordingly. For final determinations we have therefore retained our approach of dividing companies into four bands based on size.

We have however reviewed our assumptions on the equity premium. This is explained in more detail in our conclusions on the premium on equity for small companies in the paragraphs below.

The premium we have used for the final determinations are set out in table 46.

Table 46 Bands for the small company premium

	RCV	Companies	Premiums				
			Total		Equity	Debt	
			Gross of tax shield	Post-tax	Post-tax	Pre-tax	Post-tax
1	<£70m	Cambridge, Dee Valley, Folkestone & Dover and Tendring Hundred	0.9%	0.9%	1.5%	0.5%	0.4%
2	£70m-£140m	Bournemouth & W Hampshire, Portsmouth and Sutton & East Surrey	0.8%	0.7%	1.3%	0.4%	0.3%
3	£140m-£280m	Bristol, Mid Kent and South Staffordshire	0.7%	0.6%	1.2%	0.3%	0.2%
4	£280m-£700m	South East and Three Valleys	0.3%	0.3%	0.5%	0.1%	0.1%

NERA has produced two papers (April 2003 and May 2004) for the water only companies on the case for a small company premium. In their business plans, the majority of water only companies based their estimated small company premiums, to some extent, on this analysis.

NERA's 2003 report estimates midpoints for the post-tax premium of 0.5% on the cost of capital for 'intermediate' water only companies, and a premium of 0.95% for 'small' water only companies. The 2004 report presents an updated figure of 0.88% for the 'small' water only companies. These figures include equity issuance costs. NERA defines 'intermediate' water only companies as Three Valleys and South East; 'small' water only companies are all the other water only companies. This would broadly align with the two bands that we adopted at the last price review.

In response to our approach to the small company premium, NERA produced a new report in September 2004, providing further arguments to support the conclusions of its May 2004 report. Many companies argued in their representations that the small company premium assumed in our draft determinations was too low to enable them to maintain access to the capital markets on the same terms as water and sewerage companies.

Overall, we believe that NERA's reports overstate the premium to the cost of capital required by water only companies. On debt, its analysis places considerable weight on evidence from the wider market, in particular analysis of UK and US bond markets. We believe that greater emphasis should be placed on water specific evidence. This is because smaller companies

in other sectors may have very different characteristics from the water only companies, for example with regard to risk. NERA's analysis of conventional water company bonds is based on spreads at a specific date, while average spreads over a six-month period appear much lower.

On equity, NERA's evidence is more persuasive but its analysis of stock exchange volume data to support very short holding periods has proved difficult to interpret and is inconclusive. However, we have reviewed our draft determination assumptions on holding periods and concluded that a holding period of five years is reasonable. This is consistent with NERA's assumption and is based on wider considerations. We do not believe, however, that it is necessary to make an explicit additional allowance for equity issuance costs.

Our conclusions on the premium on debt

There is evidence that the small company debt premium (both on interest rates and transaction costs) has decreased since the last review. This is in part due to developments in the sector, enabling the smaller companies to gain greater access to a variety of debt sources.

Evidence for a fall in the small company debt premium comes from a number of sources, including data on the bond issued by Three Valleys in July 2004. NERA's September 2004 analysis shows an average difference in spreads over gilts of only 0.1% since July between this bond (with a credit rating of A-/A3) and bonds of similar maturity issued by Thames (bonds rated A+/A1). This suggests that Three Valleys does not require a premium on interest rates and supports the evidence on spreads at issue that we presented in our draft determination. Three Valleys' bond had a spread at issue of 95 basis points over the 5% gilt due in 2025. This spread was very close to the spread of water and sewerage companies' bonds of similar rating and maturity.

Two analyses undertaken by NERA support our calculation of the debt premium for the smaller water only companies. NERA has compared average spreads over gilts since August 2002 between South Staffordshire's 2002 bond and water and sewerage companies' debt of similar maturity and rating. It has also analysed the premium on commercial loans taken out since 1999 by 'small' water only companies. The results of these analyses support a pre-tax premium of around 0.3% for water only companies in the £140-£280 million RCV band.

NERA's conclusions on the premium on conventional bond debt are higher than this. Its estimate is based on comparisons of spreads on the day of each bond's issue. Such comparisons may be misleading, however, as spreads on a single day will be affected by other market factors. Ideally, an estimate of the bond premium would be based on a comparison of average spreads for water only companies' and water and sewerage companies' bonds issued on the same day. However, no such comparator bonds are available. The best practicable approach in this case is to compare average spreads for bonds issued on different days over a sufficiently long period of time to reduce the impact of other market factors.

Although there is little evidence for any premium on interest rates for the largest water only companies, we have allowed a small debt premium for these companies to reflect the spread of fixed issuance costs across a lower regulatory capital value. The progressively larger premiums for smaller water only companies take account of market evidence on smaller companies and the relatively higher impact of fixed costs on companies with lower regulatory capital values.

Our conclusions on the premium on equity

In contrast, we believe that the arguments presented at the last review for a premium on the cost of equity remain valid, in particular given the less liquid market in the shares of water only companies.

As a starting point for calculating the equity premium we have reviewed NERA's estimates of the premiums for 'small' and 'intermediate' water only companies, which generally appear to be based on sound analysis of the available data. NERA examines the costs associated with equity trading for water and sewerage companies, together with those for 'small' and 'intermediate' water only companies. It splits these between liquidity costs, direct commission costs and price impact costs. Excluding issuance costs, NERA estimates a premium of 1.3% for 'small' water only companies and 0.5% for 'intermediate' water only companies.

Estimates of the small company equity premium are highly dependent on the assumed volume of trading in shares. NERA, consistent with the Competition Commission's conclusions in 2000, assumes an average five-year holding period for investors. NERA puts forward a number of arguments for this holding period, including the desirability of setting the premium over the same time period as we set the cost of capital, and evidence on observed holding periods for the listed water only companies. NERA presented a new analysis on holding period data in October 2004, the results of which did not cause it to change its earlier conclusions.

We do not believe that a convincing argument has been made for equating the price control period with a notional holding period. Water companies are financed for the long term, and can be expected to raise finance over a range of timescales, irrespective of the time between price reviews. Consistent with this, we do not simply estimate the additional return that investors expect over the price control period, but take a longer term view on the required annual premium. From an investors' perspective, decisions on how long to hold investments are determined by a number of factors, and they are unlikely to seek to match their holding periods to the regulatory period. Instead, holding periods are generally for the time horizon over which they expect value to be realised.

In our draft determinations we assumed average holding periods of greater than five years, based on our examination of the volume of traded shares for the four quoted water only companies since 2000. NERA's most recent analysis, which assumes that most trades pass through a market maker, also suggests overall average holding periods of greater than five years during the same period. Even these figures may be artificially low, due to the significant corporate activity among the listed water only companies in recent years. This includes financial restructuring of all four listed companies, South Staffordshire's demerger from its parent company and East Surrey Holdings' acquisition of Phoenix Natural Gas. Any such event is likely to lead to a substantial increase in trading activity. Analysis of annual average holding periods since 2000 bears this out, indicating that holding periods for these shares have dipped below the longer term average in recent years.

From the available data, however, it is not possible to rule out a genuine change in investor attitudes to water only companies in recent years that may have reduced holding periods. We have therefore interpreted this empirical data more cautiously than in our draft determinations. In addition, we recognise the need to compensate marginal investors who may invest for less than the average holding period. We have therefore concluded that a five-year holding period assumption is appropriate.

This cautious approach on holding periods results in equity premiums towards the top of the possible range. These premiums should cover any additional equity issuance costs faced by small companies. This is consistent with our approach to the overall WACC.

In its March and September 2004 reports, NERA provided evidence that there is no clear relationship between size and liquidity costs across the traded 'small' water only companies, and that direct commission costs are proportional to the size of trade rather than varying with company size. However, its 2003 report does show a relationship between price impact costs and opportunity costs, and company size. These costs relate to the effect on the share price of trading a relatively large percentage of a company's equity in a single transaction and the cost of delaying or staggering trades to compensate for this. We believe this variation with company size should also be taken into account when calculating equity premiums for the smallest three bands of water only companies.

Our conclusions on the differences in equity premiums between the four bands have, however, changed since our draft determinations. We have assumed an equity premium of 1.3% for companies in the £70-140 million RCV band and adjusted this to take account of proportionally higher or lower price impact and opportunity costs faced by companies of different sizes. This gives equity premiums of 1.5% for companies in the less than £70 million band and 1.2% for companies in the £140-280 million band. The differences between these three bands are slightly lower than at draft determinations when we assumed equity premiums of 0.8%, 1.1% and 0.6% respectively.

In addition to these size-dependent financing costs, some water only companies have argued that they are subject to a greater risk profile because of a relatively low capital base compared with the scale of their operations. There is no evidence to suggest that this 'operational risk' is greater for water only companies than for water and sewerage companies. We will continue to set an industry-wide cost of capital that is sufficient to allow companies to finance their functions given the risk of the sector as a whole. We do not think that any move towards company-specific costs of capital is appropriate.

15.5 Financeability

The price limits have been set so that companies can continue to raise the finance in the capital markets necessary to undertake their investment programmes. We do not have a prescriptive view on the financial position or credit ratings that companies must achieve – that is for the markets and companies' managements to decide. But in light of the companies' funding requirements it is important that water companies are seen as good credit quality.

We fully recognise the importance of future cash flows as a key factor in assessing the financial risk profile of the companies. It is important to both debt and equity investors.

As in 1999, in our financial projections we have assumed an opening gearing level in 2005-06 consistent with the gearing assumption in the WACC, ie 55% (gearing measured as the ratio of net debt to RCV for all companies). We refer to this as the company's notional gearing. Companies' actual gearing levels vary, although the average level of gearing for all companies is in line with our assumption. For a large number of companies we have therefore had to adjust their opening balance sheet position in 2002-03 by varying degrees to reach this starting point. We have modelled dividends and interest costs consistent with our WACC assumptions in respect of gearing, the cost of debt and the cost of equity. In some cases these assumptions are very different from the company's assumptions underpinning the financial projections in its final business plan.

Companies' views on financeability

Companies have taken a range of approaches to financeability. This in part reflects the variety of capital structures that have been adopted in the water industry. The package of

ratios considered by companies is, on the whole, similar to that which we have used to assess financeability. However, historic cost interest cover remains the focus for some companies because of existing covenant arrangements.

The price limits take account of our view that companies need to be able to maintain issuer or corporate credit ratings comfortably in the investment grade range. The financial indicators we have used to assess companies' financeability under the proposed price limits are at levels consistent with such ratings, and should allow companies to finance the expenditure they will need to make without deterioration in credit quality below this level. Some companies have argued that they will need to maintain stronger financial indicators to avoid downgrades to their existing higher ratings. The actual capital structure that companies choose is a matter for their management and the markets. This should not be at the expense of customers, however. We have used the same package of indicators for all companies, regardless of their actual capital structures. In a number of cases, we have allowed extra revenue to ensure that the level and trend of these indicators will be in line with our targets. We have not made any special allowances for companies' actual structures.

Some companies have assumed gearing below the bottom of our range of 55-65%. This results in a more comfortable trend in cash-based financial ratios in their business plans largely because of the lower amount of debt. In some cases, companies have also assumed equity injections in the 2005-10 period in order to maintain ratios at levels that they consider appropriate.

In their business plans the proposed price limits for the water only companies generally achieve higher ratios than for the water and sewerage companies. Some water only companies explicitly stated in their business plans their view that they need to achieve higher ratios than water and sewerage companies to achieve the same credit rating. Others have implicitly linked higher ratios with the perceived additional risk of a water only company relative to a water and sewerage company.

Companies have taken a variety of approaches to dividend policy. In some cases companies' estimates of the cost of equity are inconsistent with their projected dividends (yield and growth). Others have indicated their intention to distribute all cash flow after maintenance expenditure, tax and interest. In other cases companies have taken a more conservative view by retaining a higher proportion of earnings. For example, one company forecasts a rebasing of its dividend in 2005-06. Most companies have forecast 2% per annum real dividend growth.

Financeability and risk

A number of companies in their representations suggested that the assumptions on operating and capital cost efficiencies included in the draft determinations and their differing views on future costs meant that there was insufficient 'headroom' in the financial projections to absorb potential cost shocks. This, in their view, increased the risks for companies in an asymmetric manner. Some companies sought to quantify this using a risk modelling technique developed for the industry known as 'Liquid Risk'. This technique calculates the likely probability of achieving a desired financial outcome given a range of input assumptions.

Companies argue that this risk could be offset directly by dealing with the cost and efficiency assumptions or by allowing greater 'headroom' in the financial indicators.

Our response in respect of companies' representations on the cost and efficiency assumptions are set out in chapters 5 and 10. However, we do not believe that higher price limits are required to simply provide a greater cushion against cost shocks.

As set out in section 15.7, the package of financial indicators we have used to assess the price limits does not represent a 'floor'. There remains scope for companies to absorb unanticipated downside risk and still remain within the investment grade credit rating range. We have, as noted earlier, assumed a cost of capital in price limits that is towards the high end of the possible range and well above one based solely on current market levels. This in itself allows for the possibility of unexpected cost shocks.

It is not Ofwat's role to ensure a company can finance its functions in any eventuality but to ensure an efficient company can finance its functions given price limits based on reasonable estimates and assumptions. This is what we have sought to achieve. In addition, there are other mechanisms available to companies such as interim determinations that can mitigate unexpected cost shocks, as set out in chapter 16.

15.6 The cash flow impacts of equity and debt

Equity formation and financeability

We believe that our approach to setting price limits should ensure that the sector remains adequately attractive to equity. Returns should provide shareholders with sufficient incentives to provide additional funds, either in the form of retained earnings or new equity injections, to enable companies to make additional investment where necessary. Efficient companies should be able to maintain stable credit quality going forward.

Consistent with this view, in our financial projections we have assumed that companies should retain an element of the equity return in order to finance the growing capital base. We have ensured that an appropriate dividend yield is then maintained on these additional funds. This approach has mitigated the impact of capital investment on the cash flow based financial indicators. We have made no assumptions, however, of new equity injections in our financial projections.

For the water and sewerage companies we have used a dividend yield of 5.8% consistent with the cost of equity of 7.7%. This implies dividend growth of 1.9% in real terms, which is broadly consistent with estimates of the trend in the growth in the UK's gross domestic product. In coming to a view on the appropriateness of the yield for the water sector we have taken into account the actual yields for the sector, investors' views and the need to retain earnings going forward in order to broadly maintain the level of gearing close to our cost of capital assumption.

At the time of the draft determinations when companies, in some analysts' views, were trading at or around their regulatory capital values, yields were around 6% or less on average. Since then, because of the rise in water companies' share prices, yields have fallen. We have not altered our modelling assumptions to reflect this since it does not reflect the historic view of yields on utility stocks and also it would imply higher rates of dividend growth which could not be supported (for an unchanged cost of equity).

A number of companies have questioned our dividend yield assumption, suggesting that we should have modelled a dividend yield equal to the cost of equity. Dividend policy is a matter for the companies to decide, not the regulator. However, for the purposes of modelling price limits we continue to believe that it is appropriate to assume that an element of the allowed equity return is retained.

If a company is not fully distributing its allowed equity return through dividends, then the absolute level of shareholders' equity in the regulatory capital value would be higher than otherwise would have been the case because companies would have to borrow less to

finance the growing capital base. In market terms, this would result in an increase in the market value of a company's equity. Shareholders have the choice of capitalising on this element of the equity return either in the short or longer term. This approach also mitigates the need for additional revenue to maintain financeability.

For the water only companies we have split the premium on the cost of equity proportionally between the yield and growth elements.

Since our draft determinations we have made two changes to our approach to dividend payments. In their representations, a number of companies disagreed with our modelling assumption that declared dividends were paid in full in the following year, stating that in reality a proportion is paid out as an interim dividend in the same year. For final determinations we have therefore assumed that a third of each year's declared dividend is paid out in the same year, the remaining two-thirds being paid in the following year. This change has only a marginal effect on cash flows (and therefore our assessment of financeability).

The second change is that, in the financial modelling of our draft determinations, we assumed dividends in line with our assumptions from 2003-04 onwards. For some companies, this was not consistent with the actual final, interim and preference share dividends declared in companies' final business plans after 2002-03. One company pointed out in its representation that due to our assumptions on preference share and interim dividends, this approach resulted, for most companies, in underpayment of dividends in the years before 2005-06. This led to erroneously low gearing, higher tax bills and marginally higher price limits. For final determinations we have therefore assumed in cash flows that dividends in 2003-04 and 2004-05 are based on companies' actual dividends from their final business plans but assuming the one-third, two-third split noted above.

Assumptions on interest costs

We have modelled interest costs consistent with our cost of debt assumption in the cost of capital assessment. The cost of debt represents an overall assumption on companies' average debt costs in the period 2005-10 taking into account their fixed and floating debt instruments. We have not assumed that companies raise index-linked debt to finance investment although the characteristics of this type of debt are particularly suited to RPI linked regulated sectors. An efficiently financed company is one that ensures that it has sufficient flexibility to respond to changing market conditions. This is most likely to be achieved by companies that maintain a balanced portfolio of borrowing which diversifies risk cost effectively (including refinancing, interest rate, inflation and duration risks) and is aimed at achieving broadly stable real interest costs.

Companies have recently submitted information on their actual debt costs for 2003-04. We have observed that a number of companies have swapped from floating rate to fixed rate debt in this year, which is consistent with an environment of rising interest rates. Our analysis suggests that currently average interest costs are lower, in nominal terms, than our cost of capital would imply. For financeability purposes, in modelling interest costs, we have therefore assumed a lower cost of debt in 2005-06 of 6.4% in nominal terms which is consistent with the industry average forecast included in final business plans. We assume an increasing cost of debt up to 6.8% (nominal) by 2009-10 which is consistent with our estimate of cost of debt in the WACC. Similarly for the water only companies we have trended up to the cost of debt in the cost of capital including the small company premium element for debt.

15.7 Our package of financial ratios

We have assessed financeability by calculating a wide range of financial ratios used by the credit rating agencies and the wider financial community.

There is no single set of ratios that captures the approach of all the rating agencies. Moreover, the agencies emphasise that their ratings are based on a broader assessment of the company, and not just on quantitative ratios.

Our methodology paper set out a package of financial indicators against which we expected to measure the financial projections for each company. We narrowed this range down in MD190 and explained that we would focus on cash flow measures, in particular cash interest cover, adjusted cash interest cover, cash flow to debt, the retained cash flow to debt ratio and gearing (net debt:regulatory capital value) as well as examining long run dividend cover. This reflects the focus of market practitioners.

As at the 1999 review we have not had regard to a particular company's actual covenants where these are out of line with the package of indicators adopted for the industry as a whole.

We have tested the financial projections underpinning the price limits against our package of financial ratios. The financial projections start from our assessment of gearing (consistent with our estimate in the cost of capital) and not necessarily the actual gearing or financial position of the company. In our assumptions and in the price limits, we believe we have reached an outcome that balances the interests of customers against the need to secure that efficient companies are able to access capital markets.

There are six ratios in our core package. Table 47 sets out the package of values against which we have made an assessment of the financeability of the financial projections underlying the price limits. These are a starting point for our assessment. We have considered both the level and trend of each company's overall financial profile with a view to enabling efficient companies to continue to raise finance in the capital markets to undertake their investment programmes. It is the overall trend of the package of indicators, rather than the level of any particular indicator in any particular year, that is most important.

Table 47 Ranges for financial indicators

Ratio	Value
Cash interest cover (funds from operations:gross interest)	Around 3 times
Adjusted cash interest cover (funds from operations less capital charges:gross interest)	Around 1.6 times
Adjusted cash interest cover (funds from operations less capital maintenance expenditure:gross interest)	Around 2 times
Funds from operations:debt	Greater than 13%
Retained cash flow:debt	Greater than 7%
Gearing (net debt:regulatory capital value)	Below 65%

We have also reviewed current cost dividend covers. These provide a measure of the long run sustainability of dividend payments. Given a sustainable approach to dividends we would expect the ratio to average at least one over the medium term.

There are various reasons why the profile of a company's financial projections might appear to be unsatisfactory despite being allowed an adequate return on capital. The financing constraints caused by the capital programme allowed for in the price limits impact in the later years of the period. The cumulative impact of financing the investment programme can cause financial strain as measured by a deterioration in cash flow based indicators. The capital programme, compared to that included in the draft price limits, has increased by £1.1 billion and this has compounded the financeability issue.

The profile of additional revenues allowed in price limits is shown in figure 17. This demonstrates the increasing impact in the later years.

In assessing financeability, we have had regard to the likelihood that companies will continue to face substantial investment needs for water quality and environmental improvement in the period 2005-10 and beyond. In particular, we have assumed that water and sewerage companies will remain cash negative for many years. Were this not the case, companies' financial profiles would strengthen substantially after 2010. This would reduce the need for additional revenues to alleviate financing strain in 2005-10.

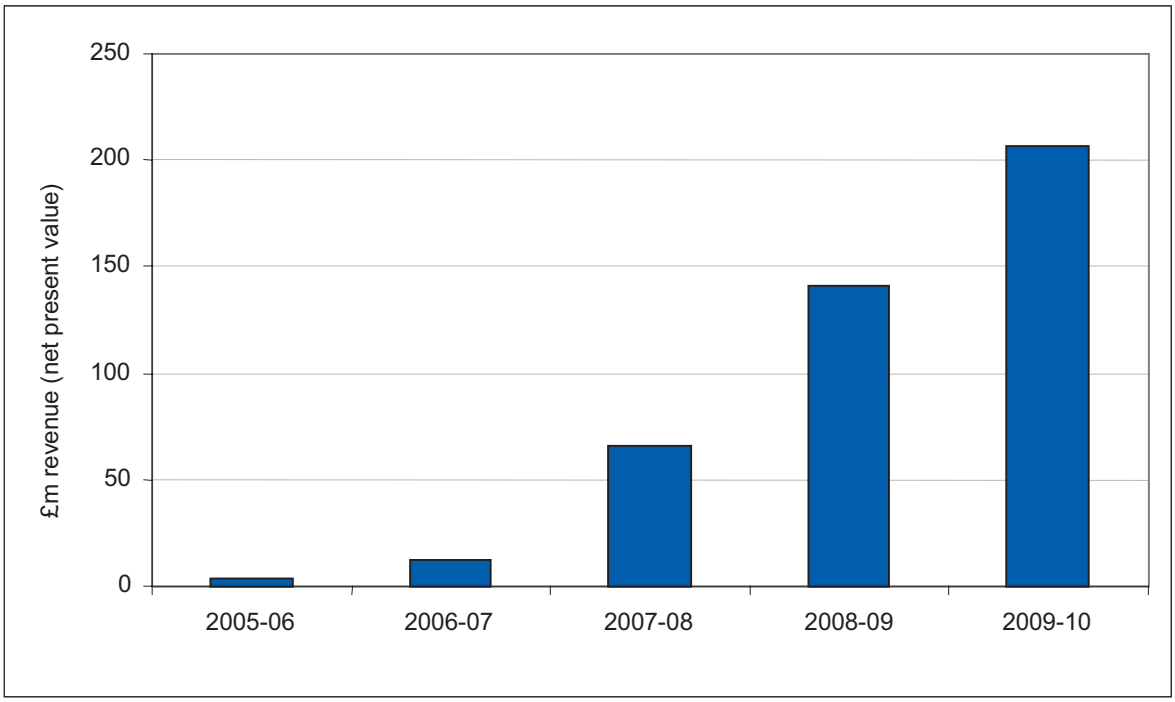
Although this might enable us to set lower price limits today, it would increase the risks faced by companies and thus potentially constrain their access to capital markets. Given the need to sustain investment in the long term, this would not be in consumers' interests.

This approach, coupled with any outperformance of our assumptions, could give rise to higher returns in the later years of the period. Given the potential capital programme beyond 2010, we would expect prudent companies to retain an appropriate proportion of earnings to alleviate the financial strain. If this is not the case, then the argument that large capital programmes increase financial strain could not be sustained at future reviews.

Where the capital programme is financed by new debt, this is likely to be raised on a nominal basis, ie the coupon, and hence interest payments will be nominal interest rates including inflation. However, price limits include an element for the return on capital that is calculated by applying a real return to an inflating capital base. This can cause a timing difference between the allowed return in price limits and companies' nominal interest costs. Companies could choose to mitigate this effect on some of the cash-based financial indicators by raising index-linked debt. For this debt instrument, cash interest payments are on a real basis but on a principal sum that grows by inflation. Consequently, such debt should enable a company to more closely match the allowed cash flows in price limits. We have not assumed index-linked debt in our modelling but note that there is a growing market for such instruments which could be used in a company's overall debt portfolio.

In aggregate the price limits include around 1.0% in 2007-08 to maintain financeability, rising to around 1.3% by 2009-10.

Figure 17 Revenue for financeability – 2005-10



15.8 Approach to financeability for small companies

At the last review we used different levels of the key financial indicators for water only companies because there was some evidence that smaller companies are less able to sustain a given level of gearing than larger companies and that this is taken into account, for example, in credit rating assessment methodologies.

Some of the water only companies have argued that this approach remains valid. They continued to argue this in their representations. They state that some of the business and financial risks assessed when determining credit quality may be accentuated for the smaller water companies and may be a factor in a credit rating assessment. However, some of the arguments presented appear to overlap with those supporting a small company premium to the cost of capital.

We have reviewed our approach and examined the position of individual water only companies very carefully. The increase in the small company equity premium should, all other things being equal, result in better financial ratios for the water only companies. Taking the package as a whole the ratios for the water only companies are better than those for the water and sewerage companies. For example, the majority of water only companies have an average level of cash interest cover above 3.5 times compared to around 3.0 times for the water and sewerage companies.

In addition, water only companies have a variety of financial structures. Over the last five years we have seen the emergence of highly geared structures which may have features that largely compensate for any size effect. A number of water only companies have issued index-linked debt which can improve cash-based interest covers. For some of the medium to large water only companies, size does not emerge as a distinguishing feature in the overall credit rating assessment. Some of the smallest companies have adopted very conservative capital structures where ratios will be more comfortable.

Generally, taking the package as a whole, the ratios for the water only companies implied by price limits are better than for the water and sewerage companies. This might be expected because of the twin effects of allowing a small company premium and the smaller capital programmes required relative to their size.

In light of all of these factors, and the fact that we have allowed a small company premium to the cost of capital (which has been increased compared with the draft determinations), we have not included a specific uplift to ratios for small companies at this review.

15.9 Regulatory capital value

The starting position for the regulatory capital value is the direct measure of the value placed on each company's debt and equity capital by the financial markets following privatisation (or a broadly similar measure for water only companies which were not floated). This is then adjusted to take account of new and projected capital expenditure, net of current cost depreciation. This approach has been consistently adopted for each of the price reviews, and the methodology as set out in our methodology paper is well understood in the industry and by stakeholders.

Since the 1999 review the regulatory capital value has been adjusted to reflect past capital efficiencies and hence pass the benefit of these efficiencies on to customers. In order to preserve sufficient incentives for companies to achieve further efficiencies, the benefit of past capital efficiencies is retained by them for five years and then captured in the regulatory capital value through a rolling adjustment. At this review, the adjustment has been smoothed over the five years on a net present value basis. This is to avoid an unduly volatile profile of adjustments to the regulatory capital value. The basis of the calculation was explained in our methodology paper.

Where companies have financed supplementary investment out of capital efficiencies, we would not generally remove such investment from the regulatory capital value. Where expenditure exceeds the assumed level on a service specific basis then the company would need to submit a well reasoned case as to why we should include the expenditure. We would normally require clear evidence that customers had been consulted, that the investment was a clear priority for them and that they were prepared to pay higher bills. Furthermore, these tests would be applied more rigorously where companies' expenditure has exceeded the total investment projected at the last review on an aggregate basis.

Some companies have invested more than was projected at the last review. None of these companies submitted a strong enough case to demonstrate that this investment should be included in their regulatory capital value. However, six companies underspent against the level of infrastructure renewals expenditure that we determined at the 1999 price review and overspent against the level of maintenance non-infrastructure expenditure determined at the same review, within the same service. For these companies, we have allowed the virement of expenditure totalling £73 million from infrastructure renewals to maintenance non-infrastructure using the logging up mechanism. In this way, companies are not penalised for reprioritising maintenance expenditure within a service.

In MD187, 'A further consultation on incentive mechanisms' (June 2003) and MD191, 'Our conclusions on rewarding outperformance and handling underperformance' (March 2004), we explained how we would deal with expenditure that was exceptionally higher than the level assumed in price limits and how the cost of this would be shared between customers and shareholders. This limit is equivalent to 10% of the total assumed service turnover in a five-year period. One company (Thames) met the criteria for its water service and we have

placed a limit on the amount of additional investment that we would exclude from its regulatory capital value.

We have adjusted the regulatory capital value for each company at 31 March 2005 that we assumed at the 1999 price review. The adjustments take account of a number of items. They include any expenditure related to new statutory obligations affecting companies since the last determination in 1999 (or a subsequent interim determination). This expenditure has been subject to the efficiency assessments set out in chapter 10. Our methodology also recognises that past capital programmes associated with agreed work to address sewer flooding would be added to the regulatory capital value in the manner described above for new statutory obligations. Conversely, for some companies, the regulatory capital value has been reduced where they have, subsequent to the last review, not been required by the quality regulators to deliver the expected outputs or these have been reduced, but for which allowance was made in price limits in 1999.

In addition, for shortfalls identified, we have also recovered an amount through the regulatory capital value that reflects in full the net present value of the 'benefit' accruing to the company from the delayed delivery or failure to deliver the relevant outputs in the current period. This will recover the shortfall over a longer period than we have done previously where we simply recovered the amount through a reduction in price limits over the five-year period. This has affected eight companies. In aggregate, logging up, logging down, shortfalls, virements and other adjustments would increase the industry aggregate regulatory capital value by £0.1 billion.

We have also adjusted for the difference between actual construction price inflation and our estimate from the 1999 review and also for land sales in the period 2000-05 (in accordance with the licence conditions of the companies). The net impact of these adjustments increases the industry aggregate regulatory capital value by £1.1 billion.

The opening regulatory capital value at 1 April 2005, after these adjustments, is £35.9 billion. As a result of our assumptions for the companies' investment programmes and depreciation charges, the aggregate regulatory capital value is expected to evolve as set out in table 48.

Table 48 Movement in the industry aggregate RCV from 2005 to 2010

£ billion (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10
Closing regulatory capital value at 31 March 2005[1]	34.7				
Opening adjustments	1.2				
Regulatory capital value at 1 April	35.9	37.0	38.5	39.6	40.3
Net new investment (after depreciation)	1.4	1.6	1.4	0.9	0.6
Adjustment for roll-out of past capital efficiency	-0.2	-0.2	-0.2	-0.2	-0.2
Regulatory capital value at 31 March	37.0	38.5	39.6	40.3	40.7

1 This is the same RCV as set out in RD 05/04 which gave an industry aggregate RCV of £35.2 billion at 31 March 2005 adjusted to a 2002-03 year end price base.

A consequence of an increasing regulatory capital value is that companies' profits will also show an increasing trend as companies earn returns on the growing capital base. However, the actual return achieved by a company will only be higher than that implied by our price

limits if the company is able to consistently outperform the operating efficiency or financial assumptions or provides a superior service for customers.

The expected movement in the RCV for each company for 2005-10 is set out in appendix 7.

15.10 Taxation

Profits need to be sufficient to remunerate investors and lenders; but they also need to cover business taxes. These are a cost to the companies and must be financed from customers' bills. The corporation tax positions of the companies vary but the impact of companies' tax payments would be significant for the bills of some customers. Up to 1995, the effective current tax rate, ie the proportion which the tax charges bear to profits, was low – averaging less than 2%. This is now rising and the financial projections implied by the price limits show the average effective current tax rate rising to 26% in 2009-10.

One of the reasons for this is that the industry's current agreement with the Inland Revenue comes to an end in April 2005. Under Tax Bulletin 53, the way that the Inland Revenue will treat certain types of expenditure for tax purposes will change so that the treatment of water companies is brought into line with other sectors of the economy. This will lead to higher levels of tax in the water sector and will exert further upward pressure on bills.

While for most companies the impact of tax payments on the bills of customers will be higher over the period 2005-10 than it has been over the period 2000-05, for some the increases in tax may be mitigated. These companies typically have high levels of gearing. Our approach assumes that price limits should include only a forecast of companies' expected tax liabilities rather than a notional tax liability linked to our assumptions on capital structure ie customers should only pay in their bills the actual level of tax faced by a company. Generally highly geared companies pay less tax because interest payments are deductible from taxable profits.

Tax and uncertainty

There are two specific areas of uncertainty with regard to the taxation of water companies.

First, companies may have to comply with International Financial Reporting Standards (IFRS) in the future, possibly from 2005 onwards. This may change the way in which water companies will have to account for infrastructure assets and, possibly as a consequence, the timing of deductions for tax purposes. The change could mean that, for statutory reporting purposes, companies would no longer be allowed to use infrastructure renewals accounting, although IFRS does not explicitly prohibit it. This may impact on the timing of tax deductions for certain types of infrastructure renewals expenditure, since the Inland Revenue may align the tax treatment with its accounting treatment. This would further increase the tax bills of companies.

The UK Accounting Standards Board (ASB) had published proposals for consultation (in Financial Reporting Exposure Draft 29 (FRED29, May 2002)) that might have had a similar effect to IFRS (and the consequent tax effects). However, the ASB has not finalised its proposals on this nor in a number of other areas of accounting until it concludes on its strategy for convergence with IFRS. It published a consultation paper on this in March 2004, which proposed a phased approach to convergence to IFRS although the paper did not specifically mention aspects relating to infrastructure renewals accounting.

Companies, in their business plans, believe that the uncertainty over the impact of FRED29 and IFRS and the possible impact on tax deductions requires a notified item. At draft determinations we had a number of concerns that led us to conclude that a notified item was not necessary. Firstly, the way in which IFRS will interact with UK accounting standards and the tax framework is very unclear. The likelihood of unambiguous implementation by both the accounting and tax authorities in 2005-10 is remote. Furthermore, to protect companies at this stage through a notified item would remove an important incentive on companies to minimise the impact of tax on customers' bills.

However, the majority of companies' representations on the draft determinations have strongly supported a notified item. It is also now clear that IFRS will also apply to companies with listed debt as well as equity. This would increase the number of water companies that will need to adopt IFRS early. Therefore, our final determinations include a one-way notified item for the impact on companies' corporation tax charges of the introduction of IFRS and FRED29. Some of our concerns remain and so the notified item has been designed so as to minimise, as far as possible, the harmful incentives.

The second issue is a more general one. In 2002, the Government consulted on a range of possible reforms of the corporation tax system. The abolition of the capital allowances regime had been identified as one potential area for change.

The Treasury announced in its 2004 budget statement that the capital allowances regime will remain in place but that Ministers would be considering whether modernisation of the system could be of benefit.

While the Inland Revenue has recently commissioned a fact-finding exercise to collect data on companies' capital assets to inform any subsequent consideration of policy, there has been no clear indication from Government that it is going to pursue this change and what the timing of that change will be. Some companies believe this should also be treated as a notified item. We do not agree.

It is not clear whether any changes would be made or how they might be implemented. Furthermore, such changes would affect all industries. It should be considered as part of normal business risk and we have made no allowance for it in price limits nor allowed it as a notified item.

16. Dealing with uncertainties

- We recognise that there are uncertainties when we set price limits.
- We have proven mechanisms to deal with significant changes when they arise.
- We have identified particular uncertainties that require notified items:
  - the number of meter optants;
  - bad debt and debt management;
  - charges for abstractions and discharges to controlled waters;
  - charges for lane rental/traffic management; and
  - changes in the taxation of infrastructure expenditure arising from the introduction of International Financial Reporting Standards.

16.1 Dealing with uncertainties

The price limits we set should be sustainable over a five-year period. However, we must allow for significant changes (both up and down) that are outside the control of an efficient company. These fall into three categories:

- changes in costs and outputs that affect industry in general;
- changes in costs and outputs that specifically affect the water industry; and
- changes in costs and outputs that we acknowledge to be too uncertain at the time of price setting to be included in price limits in full or in part.

Water companies are protected from the first of these changes because they are allowed to raise their price limits in line with general inflation (measured by a change in the RPI). The business risk inherent in the water industry, which is relatively low compared with other industries, is reflected in the cost of capital and we do not include any general allowance for unforeseen costs. The five-year price review process ensures that water companies do not carry risks for more than five years.

The following mechanisms protect the industry between reviews from material changes in costs that affect the water industry differentially.

- Interim determinations. These allow the companies, or Ofwat, to seek revised price limits if specified changes occur in the period since price limits were last set which have a total impact on the company amounting to at least 10% of a company's turnover (the materiality threshold).
- Logging up and down. This takes account, at the start of the next price limit period, of changes in outputs required of the companies during the previous price limit period.

As a further protection companies' licences allow for substantial effect determinations. These allow companies, or Ofwat, to seek revised price limits if a circumstance beyond a prudent

company's control changes so that the total adverse or beneficial impact on the company amounts to at least 20% of a company's turnover.

These mechanisms have worked well over the past 15 years and we will continue to use them. The mechanisms include the use of our change protocol (a procedure for dealing with changes in outputs between price reviews) published in MD197 'AMP4 change protocol'.

The interim determination process is set out in each company's licence. The factors that can trigger an interim determination are set out in full in Condition B. Broadly, they are:

- Notified items. These are items not allowed for, in full or at all, in price limits because the uncertainty surrounding them is too great.

- Relevant changes of circumstance (RCCs) which fall into four categories:

  - RCC(1): The application or change to specified legal requirements. These include changes to discharge consents and abstraction licences, and changes to legislation to the extent it applies to water companies in their capacity as a statutory supplier of water or sewerage services.

  - RCC(2): A change in the value received or expected from sales of land.

  - RCC(3): A change where a company has not delivered an output assumed when price limits were set.

  - RCC(4): Four companies (Anglian, United Utilities, Yorkshire and Cholderton) can trigger an interim determination if changes in the construction output price index (COPI) are significantly different from changes in the retail price index (RPI).

Since we set price limits in 1999, there have been nine interim determinations and two substantial effect determinations. The net effect of these redeterminations on price limits has been an increase in the annual average price limit of 0.5% for the industry as a whole. The issues that have triggered these determinations have been wide-ranging. They included:

- rate of uptake of free meters (a notified item); and

- bad debt and debt management costs (a notified item).

And the following were accepted as relevant changes in circumstances:

- Cryptosporidium – continuous monitoring requirements at water treatment works;

- additional sewage treatment required to comply with new consents issued by the Environment Agency after confirmation through the change protocol;

- lead – changes to the compliance programme confirmed by the DWI;

- measures to address deteriorating raw water quality;

- changes to the programme for improving unsatisfactory intermittent discharges from the sewerage system, confirmed by the change protocol;

- protection of assets;

- changes to national requirements to implement the Waste Incineration Directive;
- British Waterways discharge consents (included in a notified item for 2005-10);
- land disposals RCC(2); and
- changes in the notified index RCC (4).

We would expect similar issues where they involve new changes (and where they are not notified items) to qualify as relevant changes of circumstance should they arise again in 2005-10.

Companies have made claims in their business plans for other items which they consider place a disproportionate degree of uncertainty on the industry. We have considered these carefully. Those that meet the criteria set out in the companies' licences for relevant changes of circumstance and apply directly to the water or sewerage companies in their capacity as undertakers are likely to be treated as such in any interim determination, so long as they pass the triviality threshold and satisfy the licence conditions.

We can confirm that changes arising from the adoption of private sewers will be a relevant change of circumstance on the assumption that the regulations supporting the Water Act 2003 come into force. Should there be a change to the Guaranteed Standards Scheme payments, for example in respect of sewer flooding, then this would also be a relevant change in circumstance. Changes in discharge consents affecting the environmental programme or changes to the drinking water quality programme will also count as relevant changes of circumstance as explained in the change protocol.

Companies are concerned that the definition of relevant change of circumstance is confined to matters having a direct impact on them. Some have suggested a notified item to allow us to consider any issues that might be unforeseen at a price review but, if known at that time, might have warranted one. We have concluded that it is appropriate that companies continue to bear a proportion of the risk arising from uncertainty and if a single issue outside prudent management control is sufficient to have a serious impact on the company then a substantial effect determination may be applicable.

It is natural that companies should seek protection from as many changes as possible. However we have concluded that some of the changes they propose are adequately dealt with in the price setting mechanism, for example power costs and pensions. Others will be reflected in changes in the RPI. Others are simply business risks that need to be accepted by water and sewerage companies as for any other company, for example loss of customers through competition. We have reviewed all of the issues raised by the companies carefully and we judge that the risks are small and even if they appeared, companies should use their management skills to minimise the effects. The cost of capital takes account of this and other forms of business risk.

16.2 Notified items

A few issues are too uncertain to be included in our price limits. For these issues we set 'notified items' so that if the issues do arise and have a material impact on a company's costs then they can be considered as a reason for resetting that company's price limits between reviews. Companies put forward many issues in their business plans and representations.

After assessing the companies' proposals and representations we have set notified items for:

- Changes up or down in the number of meter optants. The Water Industry Act 1999 allows customers to change to a metered charge, without being charged for the installation of the meter. Most customers who opt for a meter do so because they expect to save money. The rate at which customers switch to a meter has a significant impact on a company's revenue but depends on decisions by customers. We recognise that the assumptions we make about future rates of optional metering may be too high or too low. These assumptions can be revised at an interim determination initiated either by the company or Ofwat. This was a notified item at the 1999 price review (at that time it only applied if our metering assumptions were too low, for most companies) and four companies have used it to trigger an interim determination since then.

- Increases in bad debt and the costs of managing debt. The Water Industry Act 1999 also prohibited the disconnection of domestic premises for non-payment of bills. We created a notified item at the 1999 review to address the uncertainty this caused. Since then, five companies have triggered an interim determination for bad debt and debt management costs. Companies have now had five years since the change in legislation to improve their debt management processes. Good practice is being shared across the industry and latest data shows that not all companies are reporting increases in bad debt. This suggests that the position may be stabilising. However, this uncertainty remains and we will include a one-way notified item for the period to the 2009 review to allow for rises in levels of household bad debt and debt management costs.

  In their representations on our draft determinations, companies claimed that the link to the loss of power to disconnect would be increasingly difficult to demonstrate. Our revised text for this notified item acknowledges that the loss of the power to disconnect is only one element of the disadvantageous conditions under which water and sewerage companies operate. We do not expect this notified item to be necessary after 2009.

- Increases in charges for abstractions and discharges to controlled waters. The costs of abstractions and discharges are more uncertain in the next five years than in the past for a number of reasons. Companies claim that abstraction charges have historically increased by more than inflation. In addition, the Environment Agency has consulted on changes to its water abstraction charges scheme, including its recovery of costs associated with environmental improvements ('Review of the water abstraction charges scheme', Environment Agency, January 2004), and published a summary of its responses under the same title in November 2004 but it has not reached conclusions.

  Final ministerial guidance, in October, confirmed that compensation payments to holders of abstraction licences revoked or amended to deliver environmental improvements, would be funded through Environment Agency abstraction charges.

  Another issue covered by the consultation was the proposal to remove the discount available to British Waterways (BWB), and hence to the companies who abstract water from BWB's canals. As a result of a ruling by the Court of Appeal in March 2001, BWB (and other owners of watercourses) can now charge sewerage companies for discharges. Some companies have reached agreements with BWB and these costs are included in their price limits. Other companies may face changes in charges in future.

We have set a notified item to protect water companies facing material increases in their net abstraction and discharge costs.

- Charges for lane rental/traffic management. At this stage we do not know what impact the provisions in the Traffic Management Act 2004 will have on water companies or what the Government will decide following the conclusion of two trials of a lane rental system in Middlesbrough and Camden. We have included a notified item to enable companies to seek a revision to price limits if the impact of either of these issues on efficient companies is significant.

- Increases in the taxation of infrastructure expenditure arising from the introduction of International Financial Reporting Standards (IFRS). It is not clear how the introduction of IFRS may interact with the UK tax framework, the corporation tax liabilities of water companies or the views of the Inland Revenue on particular cases in respect of the taxation of infrastructure renewals expenditure. Nor has any timetable yet been established for the implementation of any Financial Reporting Standard (FRS) based on FRED29 'Property, Plant and Equipment; Borrowing Costs' which may have similar impacts to IFRS. In these circumstances, Ofwat is not in a position to make any assumption on whether and when unavoidable additional taxation costs may arise for the water and sewerage companies from these causes. We have included a notified item to protect companies should a significant change in taxation costs arise from this change during the period. This approach is designed to maintain the incentive for companies to behave in a tax efficient way and to pursue the solution best designed to minimise the impact of IFRS and/or any FRS based on FRED29 on customers' bills. This issue is discussed in section 15.10.

At our draft determinations, we identified notified items covering four of the issues above – meter optants, bad debt and the costs of managing debt, some aspects of abstraction and discharge costs, and lane rental/traffic management. As stated in section 15.10, we were undecided at the draft determination stage about the need for a notified item on taxation but, following representations, we have concluded that one is required. We have also widened the scope of the notified item on abstraction charges and discharges and refined the one for bad debt and the costs of managing debt.

16.3 Licence modifications

In April 2004, we consulted on a number of modifications to companies' licences in MD189 'Proposed licence modification consultation'. Our proposed modifications covered a number of areas, most significantly in respect of interim determinations. The package of modifications sought to clarify the changes in costs and revenues that could trigger an interim determination or a substantial effect determination, and also included the extension of RCC(4) to all companies.

On the substantial effect determination we proposed revising the modifications that we made in 2000 and restoring the substantial effect clause to its original form. In their responses to our consultation the companies disagreed with our proposed approach. They argued that our proposal made it significantly more difficult to trigger a substantial effect determination, adding to the risk that companies face. We will not make the proposed change now but we will review this issue again before we set price limits in 2009.

For a standard interim determination the materiality threshold is 10% of the regulated company's turnover. At the last price review the calculation mechanism was extended to

15 years for assessing changes to operating costs and revenue losses. In practice we found that there were some difficulties with this approach. In particular, changes in the early part of the 15-year period could have a disproportionate effect when extrapolated over the full period. We therefore proposed a modification to the materiality calculation to base it on twice the present value of changes in revenue or operating expenditure over the five-year price review period. Most companies agreed with the proposal to change to a five-year period, but considered that twice the present value was insufficient and that we should use a larger multiplier. We will reconsider how best to modify the materiality calculation and will consult further on this after the current price review.

Our proposed extension to all companies of RCC(4) would have allowed us to review price limits either at our or the companies' initiative if the notified index rose at a different rate to that assumed at the last price review. The notified index reflects the difference between the construction output price index and the retail price index. Most companies welcomed this modification in their responses to the consultation.

In MD189 we said that we would set out with our draft determinations the licence modifications we proposed taking forward. We viewed the changes to interim determinations, substantial effect determinations and the extension of RCC(4) as a package. However, as companies have rejected some of the above modifications, we have decided to handle them separately from the price review process. Our assessment of risk and the cost of capital has, consequently, been made on the basis of the current licence conditions. We have, however, in setting the final price limits, assumed that construction prices will rise by slightly more than the general rate of inflation for those companies that do not have protection against this in their licences.

We will look to take all these modifications forward after the current price review and we expect to make any licence modifications ahead of the price review in 2009.

The other modifications we proposed in MD189 – the modification to remove the tariff basket headroom effect under certain circumstances, the definition of large users, amending the interim determination mechanism to cover revenue gains as well as revenue losses, and the proposed modification to Licence Condition H – were uncontroversial. We consulted on these aspects in MD194 'Proposed licence modifications: Conclusions' in August 2004.

We have written to each company setting out the changes we will be making to its licence and we will issue formal notices under section 13 of the Water Industry Act 1991 in the New Year to put these modifications in place by 1 April 2005.

Appendix 1 Respondents to 'Future water and sewerage charges 2005-10: Draft determinations'

In 'Future water and sewerage charges 2005-10: Draft determinations', we set out our initial views on the price limits the companies need for the period 2005-10. We sought representations on our proposals from the companies, WaterVoice Committees, customers and other stakeholders.

We met each company to discuss their representations on the draft determinations, and also met with representatives from all of the WaterVoice Committees.

We received around 500 written representations on our draft determinations, which we have examined carefully. A list of numbers of people and organisations who provided written representations is shown below.

We will publish on our website (www.ofwat.gov.uk):

- a full list of representations;
- copies of those representations (where respondents have given us permission to publish them); and
- a summary table setting out the issues raised in these representations and our response to them.

Type of respondent	Number of responses
Environmental groups	20
Local government organisations	11
Members of Parliament	34
Members of the public	395
Other organisations	4
Trade bodies, suppliers, contractors and consultants	7
Trade unions	2
Water companies and Water UK	24
WaterVoice and other organisations representing customers' interests	17

Appendix 2 Impact of price limits on illustrative measured and unmeasured household bills

Tables 49 and 50 illustrate the expected changes in bills for different measured and unmeasured customers in 2005-06. They supplement the average bills information set out in table 4, and the bills for 'typical' measured and unmeasured customers, shown in table 16.

We have presented these illustrative bills for the following customers:

- Unmeasured customers with rateable values of £100 and £300.
- Measured customers with an annual billed demand of 60m^3 (roughly representative of a typical single person household) and 160m^3 (roughly representative of a typical three to four person household).

For water and sewerage companies, we have presented the total bill for both services, as well as the split between water and sewerage.

These figures should be interpreted with caution, because the actual bills for 2005-06 will depend on companies' final charges schemes, due for approval by us in early 2005. These figures are based on our revenue projections, used for setting price limits. Our approach is geared to producing accurate forecasts of total tariff basket and non-tariff basket revenue, rather than forecasts of individual charges. This means the figures include some simplifications and averaging of the detailed charges included in companies' principal statements. For example, the effect of assessed charges and surface water drainage charges is averaged in these figures. So these figures are not directly comparable with those published in our annual 'Tariff structure and charges' report.

We have only provided illustrations for the change in the first year, 2005-06, rather than for all the years. This is because of the simplifications set out above and because bills in later years will in turn depend on the annual approval of charges schemes, which we cannot prejudge.

Table 49 Change in unmeasured household bills (£)

	Annual bill[1] for unmeasured households with a rateable value of £100		Percentage change	Annual bill[1] for unmeasured households with a rateable value of £300		Percentage change
	2004-05	2005-06		2004-05	2005-06	
	£	£	%	£	£	%
Water and sewerage						
Anglian	273	287	5	454	473	4
Water						
Anglian area	119	133	13	197	220	11
Hartlepool area[2]	97	106	8	97	106	8
Sewerage	155	154	-1	257	253	-1
Dŵr Cymru[4]	285	320	12	473	564	19
Water	122	142	17	199	252	27
Sewerage	163	178	9	274	311	14
Northumbrian	201	209	4	340	367	8
Water						
Northumbrian area	86	91	5	151	164	9
Essex & Suffolk area	80	83	5	178	192	8
Sewerage	114	119	4	189	203	8
Severn Trent	129	144	11	377	421	12
Water	71	78	9	204	223	9
Sewerage	58	66	14	173	197	14
South West	316	343	9	718	802	12
Water	115	130	13	231	276	20
Sewerage	201	214	6	488	525	8
Southern	172	189	10	380	434	14
Water	59	70	17	132	163	24
Sewerage	112	120	7	248	271	9
Thames	110	125	13	239	283	18
Water	56	69	24	131	171	31
Sewerage	55	56	2	109	112	3
United Utilities	180	185	3	465	484	4
Water	96	95	-2	212	210	-1
Sewerage	84	90	8	253	275	8
Wessex	173	192	11	490	547	12
Water	81	95	17	229	272	18
Sewerage	92	96	5	260	275	6
Yorkshire	210	220	5	524	555	6
Water	100	105	5	250	264	6
Sewerage	110	115	5	274	291	6
WaSC water average[3]	**85**	**93**	**9**	**189**	**212**	**12**
WaSC sewerage average[3]	**91**	**96**	**5**	**206**	**222**	**7**
Water only companies						
Bournemouth & W Hampshire	63	72	14	152	178	17
Bristol	70	78	11	174	198	13
Cambridge	54	60	10	128	144	13
Dee Valley	96	98	2	181	187	3
Folkestone & Dover	106	113	6	252	273	8
Mid Kent	94	101	7	198	217	10
Portsmouth[5]	55	55	0	99	98	-1
South East	64	72	13	167	192	15
South Staffordshire	45	50	10	133	147	10
Sutton & East Surrey	94	100	6	135	154	14
Tendring Hundred	121	119	-2	300	294	-2
Three Valleys	66	73	10	136	156	15
WoC average[3]	**67**	**73**	**9**	**148**	**166**	**12**
Industry average (water and sewerage)[3]	**172**	**185**	**7**	**388**	**425**	**10**

Unless otherwise stated charges are weighted averages for the company and include such elements as charges for highway drainage.

1 Unmeasured bill = fixed charge + (rateable value of property x rateable value charge).
2 Hartlepool operates a fixed charge for all unmeasured customers.
3 Company bills have been weighted by the number of unmeasured households that the company serves.
4 The 2004-05 bills for Dŵr Cymru takes into account the £4.50 discount that the company gave to all customers for both the water and the sewerage services. This discount reflects the company's view of the benefits to customers of its business structure. We have made no assumption for 2005-06.
5 A minimum charge applies for properties with a rateable value of £100.

Table 50 Change in measured household bills (£)

	Annual bill[1] for measured households with a billed demand of 60m[3]		Percentage change	Annual bill[1] for measured households with a billed demand of 160m[3]		Percentage change
	2004-05	2005-06		2004-05	2005-06	
	£	£	%	£	£	%
Water and sewerage						
Anglian	176	180	2	376	392	4
Water						
Anglian area	70	74	6	163	179	10
Hartlepool area[2]	53	56	5	119	126	6
Sewerage	106	106	0	213	213	0
Dŵr Cymru[4]	153	177	16	369	420	14
Water	72	85	17	165	191	16
Sewerage	81	93	15	204	229	12
Northumbrian	148	158	7	277	297	7
Water						
Northumbrian area	58	63	8	123	133	8
Essex & Suffolk area	66	71	7	145	154	7
Sewerage	89	95	6	154	164	6
Severn Trent	144	157	9	284	318	12
Water	69	74	7	156	169	9
Sewerage	75	83	10	129	149	16
South West	191	216	13	462	528	14
Water	73	87	19	164	201	23
Sewerage	118	129	9	298	327	10
Southern	146	163	12	302	348	15
Water	56	65	16	116	141	21
Sewerage	90	98	9	186	207	12
Thames	121	136	12	231	269	16
Water	56	70	24	122	158	30
Sewerage	65	66	1	109	111	2
United Utilities	174	182	4	334	353	6
Water	78	80	2	174	176	1
Sewerage	96	102	7	159	177	11
Wessex	168	181	8	365	403	10
Water	75	85	12	172	197	15
Sewerage	93	96	4	194	205	6
Yorkshire	151	159	5	321	342	7
Water	73	76	5	158	168	6
Sewerage	78	83	6	163	174	7
WaSC water average[3]	**69**	**76**	**10**	**152**	**171**	**12**
WaSC sewerage average[3]	**88**	**92**	**5**	**171**	**183**	**7**
Water only companies						
Bournemouth & W Hampshire	60	67	12	128	147	14
Bristol	66	74	13	142	163	15
Cambridge	57	62	8	117	130	11
Dee Valley	59	63	7	126	137	9
Folkestone & Dover	73	78	7	160	175	9
Mid Kent	63	67	7	145	157	8
Portsmouth	51	51	-1	101	100	-1
South East	64	72	14	145	168	16
South Staffordshire	57	62	8	119	132	11
Sutton & East Surrey	62	68	9	134	149	11
Tendring Hundred	105	104	-1	246	242	-2
Three Valleys	57	63	12	118	136	15
WoC average[3]	**62**	**68**	**10**	**135**	**151**	**12**
Industry average (water and sewerage)[3]	**155**	**166**	**7**	**321**	**350**	**9**

Unless otherwise stated charges are weighted averages for the company and include such elements as charges for highway drainage.

1 Unmeasured bill = fixed charge + (rateable value of property x rateable value charge).

2 Hartlepool operates a fixed charge for all unmeasured customers.

3 Company bills have been weighted by the number of unmeasured households that the company serves

4 The 2004-05 bills for Dŵr Cymru takes into account the £4.50 discount that the company gave to all customers for both the water and the sewerage services. This discount reflects the company's view of the benefits to customers of its business structure. We have made no assumption for 2005-06.

Appendix 3 Capital maintenance econometrics

Background

Within the overall framework of incentives to improve efficiency we recognise that the scope for improvement is not the same for all companies. We assess the relative efficiency for each company of its operating, capital maintenance and capital enhancement expenditure. These three areas of expenditure are assessed separately. Capital enhancement relative efficiency is calculated using the cost base assessment and this is described further in chapter 10 and appendix 4.

We generate statistical models using multiple regression (econometrics) to enable us to assess the relative efficiency of the companies for operating and capital maintenance expenditure. The capital maintenance models were first used in the run-up to the 1999 price review. The ongoing development of these models has been carried out in conjunction with Professor Mark Stewart from the University of Warwick. There are some sub-service areas of expenditure where we are unable to develop econometric models. The assessment of these areas of expenditure is based on simple unit costs; a company with high unit costs is assumed to be less efficient than a company with low unit costs.

Capital maintenance expenditure is split into four water and five sewerage sub-service areas. We have five econometric models, three for the water service and two for the sewerage service. The remaining one water and three sewerage sub-service areas are simple unit cost models. A full description of the models used for capital maintenance and assessing operating efficiency was published in the 'Water and sewerage service unit costs and relative efficiency – 2002-03 report'.

Econometric models

During 2003 we undertook a review of our capital maintenance econometric models. We consulted with industry representatives through a liaison group set up with Water UK. We have listened to the suggestions made and assessed the ideas and alternative models put forward by the industry in this process.

The current models are based on 1997-98 explanatory variables and six-year average expenditure (1998-99 to 2003-04). We model average expenditure to take account of annual variations in capital maintenance spend. The explanatory variables are taken from the year prior to the first year of expenditure. This ensures that the model is not unduly influenced by this expenditure.

Relative efficiency adjustments following modelling

Three adjustments are made to companies' combined actual expenditure after modelling. We make adjustments for leakage expenditure allocation (water only), special factors and future expenditure. In 2002-03 we made adjustments for leakage expenditure allocation and special factors. The future expenditure adjustment is being used for the first time at this review. These adjustments are explained in the following paragraphs.

Leakage adjustment

We have made adjustments for six companies to remove expenditure on leakage control costs from capital maintenance water expenditure. Similar adjustments have been made to the operating expenditure models. These adjustments were made for the first time in our 2002-03 relative efficiency analysis, to ensure consistent treatment of these costs across the industry.

Special factors

There are company-specific factors that cannot be incorporated into the econometric models. These are typically led by significantly higher capital maintenance expenditure compared with other companies, that is outside management control. Companies were asked to submit their claims for special factors in their final business plans. A number of companies made representations relating to their special factor claims following our draft determinations. We have assessed these claims for our final determinations and reported on the individual special factors in companies' supplementary reports.

We use a regional price adjustment to take account of above-average regional price variations across the industry. To assess the impact of regional price variations we use information from both the Building Cost Information Service (BCIS) and the Department of Trade and Industry. The same analysis is used to inform regional price adjustments to the cost base standard costs. Following company representations we have revised our assessment of this adjustment for our final determinations.

Future expenditure adjustment

The econometric models use a six-year average of expenditure over the period 1998-99 to 2003-04. This takes account of annual variations in capital maintenance expenditure and ensures that the explanatory variables are independent of modelled expenditure. The longer the period of expenditure considered for the modelled average, the smaller the impact of peaks or troughs on the average. Some companies feel that the current six-year average is not long enough to remove this impact. This future expenditure adjustment allows us to extend this average period before relative efficiency targets are calculated, therefore smoothing out the effect of lumpy expenditure.

A company that has proportionally spent large sums of money on the maintenance of its assets in the past and is projecting reduced expenditure in the future, may believe that our efficiency target based solely on historical information is too tough. This is because it would have a high efficiency target going forward applied to a low future spending profile. The reverse is also true. A company that has spent little on its assets in the last six years may look efficient on the econometric models. Due to the time lag between insufficient maintenance and a detectable deterioration in serviceability, this lack of activity may not be apparent, especially in long-lifed infrastructure assets. If this company's spending for 2004-05 to 2009-10 increases, it would have a low efficiency target applied to its higher spending profile. Some companies, which are a significant way towards implementing the common framework, do not accept the current method of calculating the econometric element of capital maintenance efficiency targets.

We have developed an adjustment that reflects future capital maintenance expenditure and addresses these issues. The adjustment is based on companies' 2004-05 projections of capital maintenance expenditure taken from their final business plans and our assessment of capital maintenance needs for 2004-05 to 2009-10. This is combined with the last six years' modelled expenditure (after leakage adjustments) to calculate a 12-year average, 1998-99 to 2009-10, therefore reflecting both actual and projected spend equally. This provides an even

balance between what companies have actually spent and their needs for the next price limit period.

The difference between the 12-year average and the 6-year average modelled expenditure (1998-99 to 2003-04) equals the value of the adjustment. This adjustment is made prior to efficiency band calculation and before special factors are applied. Table 51 shows an illustration of this calculation for a company that has lower future expenditure than the historic average. In this example the adjustment reduces the average expenditure by £5 million.

Table 51 Illustration of future expenditure adjustment

£m	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Total
Modelled expenditure (June return less leakage expenditure)	110	125	105	115	100	105	–	–	–	–	–	–	660
Company projected 2004-05 and Ofwat assumptions of 2005-06 to 2009-10	–	–	–	–	–	–	100	90	95	95	110	110	600
Actual and projected expenditure	**110**	**125**	**105**	**115**	**100**	**105**	**100**	**90**	**95**	**95**	**110**	**110**	**1,260**

1998-99 to 2003-04 average modelled expenditure after leakage reallocation adjustments	**£110m**
2004-05 to 2009-10 average projected expenditure	**£100m**
12-year average expenditure 1998-99 to 2009-10 ([100+110]/2)	**£105m**
Value of adjustment (difference between 12-year average and 6-year actual average [105-110])	**£-5m**

This adjustment will have different effects for each company depending on its spending profile over the 12-year period. A company with projected lower spending in 2004-05 to 2009-10 than in 1998-99 to 2003-04 will get a negative adjustment. It will move closer to the benchmark and this may also result in an improved efficiency band. The reverse is also true. A company with lower spending for the last six years compared with 2005-06 to 2009-10 will get a positive adjustment, it will move away from the benchmark and may move down the efficiency bands.

More than half of the companies do not change band as a result of this adjustment; table 52 shows the movement in companies' bands resulting from this adjustment.

Table 52 Effect of future expenditure adjustment on capital maintenance econometric efficiency band

Number of 5% band changes	Number of companies (water)	Number of companies (sewerage)
+3	1	0
+2	0	0
+1	2	1
0	13	7
-1	4	2
-2	2	0
-3	0	0

Calculation of econometric efficiency target

The econometric relative efficiency band and catch-up is based on our analysis of the econometric models and the adjustments explained above. Figure 18 illustrates how the efficiency target is derived.

Tables 53 and 54 show the relative efficiency bandings and company ranks for capital maintenance water and sewerage based on the econometrics and adjustments. Since our draft determinations, five companies have moved from band C to B, four on the water service assessment and one on the sewerage service. These movements are the result of changes in the value of the forward look adjustment and revised special factor allowances.

Figure 18 Calculating the capital maintenance econometrics efficiency target

		Banding
Stage 1: Modelled expenditure	£100	Actual six-year average expenditure (1998-99 to 2003-04) (as used in econometric models)
Stage 2: Removal of leakage expenditure	£5	Reallocate leakage expenditure from stage 1 (water only)
	£95	Adjusted average expenditure after stage 2
Stage 3: Adjustment for future spend	£-7	Adjust stage 2 expenditure for future spend adjustment
	£88	Adjusted average expenditure after stage 3
Stage 4: Special factors	£3	Remove special factors from stage 3
	£85	Adjusted average expenditure after stage 4
Stage 5: Predicted expenditure	£80	Predicted expenditure (results of econometric models)
Stage 6: Calculation of residual	£5	Residual (£m) (difference between end of stage 4 and stage 5)
	6.25%	Residual (%)
	5.63%	Residual after 10% adjustment (20% adjustment to sewerage residual)
Stage 7:	-10%	Benchmark
	14.8	Distance to benchmark
Stage 8:	**Upper B**	**Banding**
	5%	**Efficiency target (40% to benchmark)**

Table 53 Relative capital maintenance efficiency bands and ranks based on econometric analysis – water service 2003-04

	Capital maintenance efficiency – econometrics	Capital maintenance efficiency – econometrics
	Band A to E	Rank 1-22
Water and sewerage companies		
Anglian	B	15
Dŵr Cymru	B	17
Northumbrian	A	7
Severn Trent	B	14
South West	B	12
Southern	C	20
Thames	A	4
United Utilities	B	18
Wessex	C	22
Yorkshire	A	8
Water only companies		
Bournemouth & W Hampshire	A	5
Bristol	B	11
Cambridge	A	2
Dee Valley	C	21
Folkestone & Dover	A	3
Mid Kent	C	19
Portsmouth	A	1
South East	A	10
South Staffordshire	A	9
Sutton & East Surrey	B	16
Tendring Hundred	B	13
Three Valleys	A	6

Table 54 Relative capital maintenance efficiency bands and ranks based on econometric analysis – sewerage service 2003-04

	Capital maintenance efficiency – econometrics	Capital maintenance efficiency – econometrics
	Band A to E	**Rank 1-10**
Water and sewerage companies		
Anglian	A	2
Dŵr Cymru	A	6
Northumbrian	A	4
Severn Trent	B	7
South West	B	8
Southern	D	10
Thames	A	5
United Utilities	C	9
Wessex	A	3
Yorkshire	A	1

Appendix 4 Capital productivity: the cost base

We use the cost base to assess the relative efficiency of water companies in procuring and implementing capital projects. The cost base consists of a database of costs for a wide range of standardised projects or units of work typical to the water industry (standard costs). We specified the standard costs in the cost base information requirements issued to companies for their final business plans. Each company has provided us with audited estimates for the standard costs based on, as far as is possible, its own current or recent capital works programmes. By comparing the companies' standard costs, we are able to gauge the relative capital efficiency of each company.

The cost base was first used at the 1994 price review. We built on the approach for the 1999 review and have continued to improve the method and its application for this review.

Following our draft determinations, Water UK submitted a report by Ove Arup and E C Harris updating the findings of a study they had carried out on the cost base for the 1999 price review. We reviewed the report in detail and found that it acknowledged the improvements we have made for this review in the cost base process; the technical specifications; and guidance on the role of the reporters. It identified a number of concerns about the use of the cost base, many of which it had raised in the initial report in December 1998. Generally, we have addressed these concerns during the evolution of our approach for this review, but there are some recommendations in the report that can be further developed for the 2009 review.

We consider that the cost base approach has stood the test of time. It has been subjected to independent scrutiny at both of the previous price reviews. In 2000, the Competition Commission, in its report on the price limits for Mid Kent and Sutton & East Surrey, concluded that the approach had worked well since 1995.

The process leading to the final business plan submission

During 2002, we carried out a consultation with the industry on the format and content of the cost base information requirements for use in the 2004 price review. We provided the results of this consultation to the companies in RD 01/03 'Cost base consultation and issue of reporting requirements' (January 2003) and RD 04/03 'Cost base information requirements – feedback on the consultation' (February 2003). We issued revised cost base information requirements to companies on 31 January 2003.

On 31 March 2003, each company submitted its initial standard costs for the cost base. The reporters submitted their analysis of each company's submission subsequently. The main purpose of this submission was to inform the reference level efficiency assumptions provided to companies for use in their draft business plans submitted in August 2003.

Our report 'Capital works unit costs in the water industry: Feedback on our analysis of the March 2003 water company cost base submissions' (May 2003), enabled the companies to focus their attention on areas of their capital investment programme where unit costs were comparatively high. It also provided useful feedback on our methodology and approach to selecting benchmark companies. We provided each company with individual feedback on their cost base submissions in June 2003.

Companies were given the option of submitting a revised cost base in their draft business plans following their review of our feedback report. In total, 14 companies chose to provide

revised standard costs. The majority of these costs were lower than those submitted previously. We published the results of our analysis in the 'Water and sewerage service unit costs and relative efficiency – 2002-2003 report' (January 2004).

For the final business plan, we made a number of changes to the March 2003 cost base information requirements. We improved and refined the clarity of the definitions and specifications in the light of comments made by companies and reporters during 2003. We also provided additional commentary on key issues that had been identified during our analysis of the previous cost base submissions.

All companies were required to submit their final cost base standard costs in their business plans in April 2004. Our analysis of the final cost base submission is summarised below, with the overall results of the analysis shown in table 56.

Compliance with the specifications and guidance

The overall quality of companies' final submissions and the commentary provided by reporters on the cost base submissions was acceptable and had improved compared with the earlier submissions. However, whilst the majority of costs submitted were in accordance with our specifications and guidance, there were many areas where we needed clarification in order to reach fair judgements on relative efficiency. As a result we issued 180 separate queries to confirm:

- the consistency of standard costs with the specifications;
- any company-specific adjustments; and
- the reasons why some companies had not submitted some standard costs.

We received satisfactory responses to most of the queries we issued.

Despite some differing interpretations of the information requirements, particularly with the non-infrastructure specifications, overall we are satisfied that we have achieved a good comparison of standard costs between companies on which to derive judgements of future capital efficiency. We have excluded only a few standard costs from our analysis due to inconsistencies with the specifications or other issues.

Reporters' independent scrutiny of the standard costs

Reporters subject companies' cost base reports to effective and focused scrutiny. We required the reporters to subject the companies' submissions to detailed review to verify that standard costs submitted by companies were prepared in accordance with the cost base information requirements. The reporters were able to do this except for a small number of standard costs. We are satisfied that companies substantially complied with our requirements.

Independent review of companies' submissions

A specialist team of independent consultants from the Babtie Group has carried out a detailed assessment of both the companies' submissions and reporters' reports.

Having provided expert technical and costing advice on the cost base at previous price reviews, the Babtie Group have built up extensive knowledge and experience of the cost base approach and methodology.

The role of the Babtie Group was to carry out a detailed, fully auditable and independent assessment of the companies' submissions. Using information contained in the submissions and the associated reporters' reports, the Babtie team was asked to verify that:

- companies' standard costs were comparable, by checking that standard costs complied with our specifications and guidance included in the information requirements;
- standard cost data sources were consistent with companies' capital expenditure proposals; and
- the selected benchmark companies were robust for each standard cost.

This role is important to ensure that we can apply the cost base results to the companies' capital expenditure proposals in a fair and consistent manner.

Accuracy of the standard costs

We use engineering judgement grades (EJGs) to assign both a reliability and accuracy grade to each individual cost. A grade of A1 indicates that the cost is based on accurate company-specific data relating to an activity that the company has considerable experience of, whereas a grade of D4 is based on international or notional estimates with no company experience of that activity.

In the information requirements we state that we expect engineering judgement grades of B3 or better. This grade indicates that standard cost estimates are mainly based on company-specific data and the estimates are to within +/- 30% of the likely costs of carrying out such a standardised project.

Generally, companies were able to meet this requirement. Table 55 below confirms that only 5% of the costs submitted were assigned an EJG worse than B3.

Table 55 Distribution of engineering judgement grades

A1	A2	A3	B1	B2	B3	Below B3
14%	**28%**	**4%**	**2%**	**34%**	**13%**	**5%**

Most companies submitted costs based on reliable data derived from actual company experience in capital works and were accurate to within +/- 20%.

Selection of benchmark companies

The benchmark selection process builds on the cost base method used at the price review in 1999. We chose benchmark companies for each standard cost or group of standard costs based on the lowest reported cost, provided it complied with the following criteria:

- the standard cost(s) used to derive the benchmark materially complied with the standard cost specification;
- at least 3% of the industry (measured in terms of turnover) reported unit costs at or below the selected benchmark standard cost;
- the standard cost was sufficiently robust to warrant an EJG of B3 or better (mostly B2 or better);
- the chosen benchmark company's business plan indicated significant investment planned for the type of activity represented by the standard cost; and
- the relevant benchmark was independently endorsed by our consultants, Babtie Group.

Where possible, we chose a single benchmark company for groups of standard costs for the same activity, eg a single company's costs were used as the frontier company for all 18 sewer laying activities even though their costs were not necessarily the lowest reported cost in each particular size band.

Standard costs identified as likely to be materially non-compliant with the specification, or subject to adjustment following an inadequate or nil response to a query, were not considered for benchmark selection.

Overall, Babtie Group informed us they were satisfied that the selected benchmarks were representative of the lowest reported standard costs and were consistent with the cost base reporting requirements and the criteria within our assessment process as noted above.

Company-specific factor – regional price adjustment

A number of companies proposed company-specific adjustments to their costs on the grounds that their construction, tender and labour costs have been higher than other companies due to their location in the south of the country, particularly areas in and around London.

To assess these claims, we carried out a study of building and construction cost indices (including the effects of labour) published by the Building Cost Information Service (BCIS) and Department of Trade and Industry. The results supported the majority of the claims made and we have allowed a significant proportion but not all of the cost adjustments that companies sought. We did not allow claims where the results of our analysis did not support a company's claim.

In light of a company's representation, for the final determination we have revised our analysis of these indices by modifying the way we calculate each company's regional variance.

The results indicated that for these companies there was overall scope for regional price variation factors of between 4% and 18% when compared with the England and Wales average. It was therefore justifiable to make downward adjustments to these companies' standard costs in order to improve their comparability with other companies' costs, prior to selecting benchmarks and assessing relative efficiency.

When we applied these overall regional price factors to the typical civil construction and plant installation and supervision elements of each standard cost, this gave us the company-

specific regional price adjustments. These adjustments ranged from 0.8% to 17.5% in the water service and from 1.7% to 15.7% in the sewerage service.

This is the only company-specific factor included in the cost base.

Changes in approach since draft determinations

We carried out a detailed review of the comments made by the companies and their reporters in their representations on the cost base. In particular, we checked for errors and anomalies in our approach or in the actual data used to inform the catch-up efficiency factors we had included in our draft determinations.

Two companies identified an inconsistency in our process with reference to the inclusion of the new meter standard costs within the water non-infrastructure analysis. They stated that as we set separate efficiency targets for new meters, these costs should not contribute to the overall water non-infrastructure target. We accepted this change in approach and did not include these standard costs in our final determination analysis.

Two companies, Dŵr Cymru and Southern, were identified as having specific data issues relating to a group of standard costs used to inform their sewerage non-infrastructure catch-up efficiency. For Dŵr Cymru we have reinstated some of its standard costs that we had previously believed to not be in accordance with the information requirements. For Southern we have included six standard costs submitted by the company in its draft business plan cost base due to movements in its standard costs between the draft and final business plan submissions.

Two companies also submitted revised standard costs in support of their representations on the cost base. To maintain a consistent approach and for fairness to all companies, we have only adjusted our analysis where these representations identified an error or anomaly in our approach to the draft determinations.

Use of the cost base in final price limits

Comparing each company's standard costs with the chosen benchmark costs and weighting, this gap alongside the company's capital expenditure projections for 2005-06 to 2009-10 allows us to derive an overall 'catch-up' efficiency factor for each company.

We derive catch-up efficiency factors for each of the four sub-service asset groups:

- water underground assets (water infrastructure);
- water above ground assets (water non-infrastructure);
- sewerage underground assets (sewerage infrastructure); and
- sewerage above ground assets (sewerage non-infrastructure).

Table 56 sets out the catch-up factors arising from our analysis of companies' final business plans' cost base. These catch-up factors are used to support the future capital efficiency assumptions included in our draft determinations. The industry average figures shown are simple industry averages and are not weighted by company expenditure.

For capital maintenance expenditure, we have used both the cost base and econometric models (see appendix 3) to inform our judgements on the catch-up efficiency for each company's sub-service. The cost base catch-up factors for capital maintenance are derived on the basis that the company will close 50% of the gap between its costs and the benchmark costs.

For capital enhancement expenditure and meters, the catch-up factors are derived from the cost base analysis only and they are applied separately to each asset group. The factors assume that the company will close 75% of the gap between its costs and the benchmark costs.

Table 56 Catch-up efficiency arising from the cost base

	Water service				
	Underground assets (infrastructure)		Above ground assets (non-infrastructure)		
	Cost base factors		Cost base factors		
	Capital maintenance	Capital enhancement	Capital maintenance	Capital enhancement	Meters
Anglian	6.1%	9.1%	10.0%	15.0%	2.9%
Dŵr Cymru	4.3%	6.4%	2.9%	4.3%	8.5%
Northumbrian	9.7%	14.5%	8.4%	12.6%	0.0%
Severn Trent	4.7%	7.1%	3.6%	5.5%	7.8%
South West	1.6%	2.4%	4.0%	6.0%	0.0%
Southern	7.9%	11.9%	9.6%	14.4%	12.3%
Thames	6.1%	9.1%	5.2%	7.7%	8.3%
United Utilities	2.3%	3.4%	9.6%	14.4%	19.3%
Wessex	1.2%	1.7%	1.5%	2.3%	0.0%
Yorkshire	1.9%	2.9%	1.8%	2.7%	0.0%
Bournemouth & W Hampshire	9.6%	14.4%	8.9%	13.4%	0.0%
Bristol	15.8%	23.7%	9.0%	13.5%	0.0%
Cambridge	17.4%	26.2%	13.9%	20.8%	28.3%
Dee Valley	11.5%	17.2%	6.8%	10.2%	6.8%
Folkestone & Dover	12.1%	18.2%	3.0%	4.5%	0.0%
Mid Kent	6.6%	9.9%	3.9%	5.8%	0.0%
Portsmouth	5.9%	8.9%	7.5%	11.2%	0.0%
South East	6.2%	9.4%	4.6%	7.0%	9.4%
South Staffordshire	6.6%	9.9%	7.6%	11.5%	22.0%
Sutton & East Surrey	8.8%	13.2%	10.5%	15.7%	13.8%
Tendring Hundred	5.7%	8.6%	6.7%	10.1%	1.6%
Three Valleys	10.1%	15.1%	6.4%	9.5%	16.1%
Industry average	**7.4%**	**11.1%**	**6.6%**	**9.9%**	**7.1%**

	Sewerage service			
	Underground assets (infrastructure)		Above ground assets (non-infrastructure)	
	Cost base factors		Cost base factors	
	Capital maintenance	Capital enhancement	Capital maintenance	Capital enhancement
Anglian	10.6%	15.9%	6.7%	10.1%
Dŵr Cymru	4.3%	6.4%	4.1%	6.2%
Northumbrian	9.0%	13.5%	6.2%	9.4%
Severn Trent	2.5%	3.7%	1.2%	1.8%
South West	9.2%	13.9%	9.4%	14.1%
Southern	1.7%	2.6%	6.0%	9.0%
Thames	8.4%	12.6%	8.0%	11.9%
United Utilities	7.1%	10.6%	6.3%	9.4%
Wessex	1.6%	2.4%	2.8%	4.2%
Yorkshire	4.8%	7.2%	6.1%	9.2%
Industry average	**5.9%**	**8.9%**	**5.7%**	**8.5%**

For capital maintenance expenditure, the above catch-up efficiency factors are phased equally over the first three years of the period 2005-06 to 2009-10. For capital enhancement expenditure, the efficiency factors are applied in full in the first year 2005-06.

Appendix 5 Cost of capital

This appendix provides further detail about our analysis of the cost of capital and the evidence that we have considered in coming to our assessment of it for our final price limits. It provides a summary of the views presented by the companies which are heavily dependent on a series of reports produced by consultants National Economic Research Associates (NERA) on behalf of the water only companies and Water UK.

It also draws together, using the CAPM framework, some of the academic research in this area; approaches taken by other regulators, in particular Ofgem; and other regulatory precedent, for example the position taken by the Competition Commission.

Views on the weighted average cost of capital (WACC)

Ofwat's assessment of the WACC

There has been an extended period of volatility in the capital markets. Such volatility means that less reliance can be placed on the conventional methods of assessing the cost of equity such as the CAPM. CAPM analysis of current market data can produce apparently plausible numbers that cover a very wide range.

The report produced by Smithers and Co (2003), on behalf of the regulators, looked at alternative models that seek to address the empirical shortcomings of the CAPM. These include multifactor models, which assume that there is more than one factor driving returns. The authors concluded that the CAPM has empirical shortcomings, but that these are no worse than the other available models. Its strengths are that it is relatively simple and has clear theoretical foundations. Alternative models allow too much flexibility and therefore cannot reliably produce robust results that would withstand challenge. The study therefore concluded that there is at present no clear successor to the CAPM for the practical estimation of the cost of equity.

We commissioned Cambridge Economic Policy Associates (CEPA) and Europe Economics (EE) to advise us jointly on the WACC and related issues for this review. Together with CEPA/EE we have reviewed the evidence from markets and elsewhere and CEPA/EE have provided advice to us throughout the price review.

CEPA/EE concluded that the CAPM framework should continue to form part of the basis on which the cost of capital is assessed, but agree with us that it is important to take account of other evidence including that from other models (principally the dividend growth model), from market valuations and investors' surveys.

Following publication of our draft determinations, CEPA/EE provided us with their final advice on the cost of capital in late October 2004. On the basis of their review of the CAPM parameters they had previously derived, CEPA/EE concluded that there was no material change in the market data that suggested a need to revise its previous estimate of the WACC.

In chapter 15 we have summarised our analysis and conclusion on the appropriate cost of capital that we have assumed. For the water and sewerage companies, we have assumed a cost of debt of 4.3% (real pre-tax) and a cost of equity of 7.7% (real post-tax). Assuming gearing of 55%, our WACC included in the price limits is 5.1% (real post-tax).

The industry's views

Water UK commissioned a study on the cost of capital for water companies from NERA, which published its initial report on 12 August 2003 'UK water cost of capital: A final report for Water UK' to support companies' draft business plans. NERA updated its work in March 2004 in time for companies' final business plans.

In its August 2003 report, NERA's best estimate of the real post-tax WACC for the water industry as a whole was 5.75% (before the small company premium). This was based on an analysis of equity market valuations and use of the CAPM framework to produce time series and spot estimates of the cost of capital. It assumed gearing of 50%.

NERA suggested that evidence from market valuations points to the WACC determined at the 1999 review (ie the basic WACC of 4.75% before embedded debt premium) as being around 1% too low. The market valuations used both share price trend information from the quoted water companies and data from corporate transactions involving water companies. NERA's CAPM estimate based on a time series analysis resulted in an estimate of 5.79%, whilst on a spot basis, using current market rates only, the figure was 4.86%. In coming to its best estimate of 5.75%, most weight was given to the time series analysis, which, NERA argued, is more consistent with the market valuation data.

In its subsequent report of March 2004, NERA reduced its best estimate of the overall WACC to 5.5% on a fully post-tax basis. On the basis of market valuation data, NERA argued that the average market to asset ratio (MAR) discount over the period since the last price review is 9%. NERA estimates that such a discount is equivalent to 0.75% on the WACC used for the 1999 review indicating a future WACC of 5.5%. In this report, NERA's CAPM-based estimate of the WACC is 5.1% and its dividend growth model estimate is 5.7%, with a mid-point of these values of 5.4%.

The main differences between the draft and final reports are as follows:

- A reduction in the real pre-tax cost of debt from 4.55% to 4.0%. This is derived as the actual cost of debt issued by the water and sewerage companies over the period since the last review (including issuance costs). In its initial report, NERA's cost of debt, based on time series analysis, used a risk-free rate of 3.1% and a debt premium of 1.45%.

- Use of 60% gearing for the WACC calculation, combined with the assumption that the geared equity beta and cost of equity increase, leave the WACC unchanged in the final report.

- Greater emphasis on the evidence of the dividend growth model to assess the cost of equity (linked to a lack of confidence in the robustness of the outputs of the CAPM methodology).

The companies' business plans

In their final business plans, a large number of companies relied on the updated NERA study. Of those companies that based their analysis on the NERA report, the range of estimates for the water and sewerage companies was between 5.2% and 5.5% for the basic post-tax WACC in real terms. One water and sewerage company continued to use the reference plan cost of capital of 5.0%. A few companies submitted estimates based on their own independent analysis or independently commissioned research, although some of these cite NERA in support of their estimates. These analyses produced results with a similar range of 5.25% to 5.5%.

On average, the water and sewerage companies have estimated a WACC of 5.3% (post-tax real), compared with 5.5% at the draft business plan stage.

For the water only companies, there is greater variability in the estimated WACC mainly due to different views on the size of the small company premium. Most estimates of the small company premium are based on a 2003 study also undertaken by NERA. The estimates of the real post-tax cost of capital range from 5.7% to 6.5% with an average of 6.1% compared with 6.4% in the draft business plans.

The companies' estimates of the WACC have therefore fallen for the final plans. This reflects, in part, the reduction in the estimate in the final NERA report as well as, in our view, greater realism in estimating the parameters than at the time that draft business plans were submitted.

Reaction since draft determinations

We have not changed our assumption on the WACC compared with our draft determinations. In their representations, most of the companies continued to argue that this figure is too low, but provided no further evidence. The WACC we have used is at the high end of a possible range supported by the evidence. There are a number of factors that affect the share price movements of the listed water stocks, but the upward trend in share prices since publication of our draft determinations partly reflects the ending of a period of uncertainty but also partly reflects the overall reaction from the City. It does not appear to support a position that the allowed cost of capital is too low. Most recently, share prices have started to fall but have not returned to their pre-draft determination levels.

Some commentators argue that the allowances we made for additional revenue for financeability strengthens the companies' argument. We do not agree that our overall approach to financeability undermines our assessment of the WACC. Whilst companies remain cash flow negative there will continue to be a strain on the financial ratios that underpin their credit quality. This in turn is driven by the cumulative effect of the capital programme, which does not impact uniformly across the companies. Our approach minimises the impact on customers. This is because financeability revenues are back-end loaded, not impacting significantly until 2007-08. For the majority of water only companies, which have much more limited capital programmes, there has been no financeability uplift.

Evidence on the risk-free rate

Real yields on medium maturity index-linked gilts (maturity of ten years and above) have averaged just under 2% over the last six months and just above 2% over the last five years. Consequently, the short-term data supports a risk-free rate of just 2.0%. Current gilt yields are significantly below the long-term average. Analysis of time series data confirms a shift from yields in the range of 3-4% to yields of just over 2% from late 1998. The average gilt yield is 2.5% if averaged over eight years; it is 3.0% if averaged over 13 years. Over the period since 1980, real returns have averaged 4.2%.

Companies' estimates of the risk-free rate range from 2.5% to 2.9%, and average around 2.7%, with no marked differences between the water and sewerage companies and water only companies. In assessing the cost of debt, not all companies separate out the risk-free rate and debt premium but estimate the cost of debt directly.

In its final report NERA's CAPM-derived WACC uses 2.9% as an appropriate estimate of the risk-free rate. This level is supported by estimates of the risk-free rate in international markets. NERA argues that since 1997 the risk-free rate has been artificially depressed by specific UK factors including the Minimum Funding Requirement, unusual market volatility

and by a reduced supply of index-linked gilts. NERA argues that it is reasonable to expect that many of these factors will not continue over the long term. It prefers to use a two-year average of major international (US and France) index-linked government bond yields as a better indicator of the current risk-free rate.

Recent regulatory determinations have placed little weight on the current very low gilt rates. The Competition Commission has also noted that current yields should be used with caution when estimating the risk-free rate due to the volatility of the markets. In its most recent decision the Competition Commission adopted a range of 2.5% to 2.75% compared with a range of 2.75% to 3.25% which it adopted in its decisions on the price limit referrals of Mid Kent and Sutton & East Surrey in 2000. The Smithers (2003) study undertaken on behalf of the regulators concludes that a reasonable assumption for the risk-free rate is 2.5%.

In its March 2004 document on the price control for the distribution network operators, Ofgem concluded that it could be appropriate to adopt a slightly wider range than the most recent Competition Commission decision using a range for the risk free rate of 2.25% to 3.0%.

Our estimate for the risk-free rate is in the range 2.5% to 3%. It is based on the longer run level of yields on medium term index-linked gilts rather than the current rate which the evidence suggests is historically low. Since our draft determinations, real yields have declined further, albeit very marginally. We do not think this is sufficient to warrant a change in our approach and to simply take account of the current market spot rate would not lead to a sustainable WACC over the medium term.

Evidence on the debt premium

Current debt spreads for bonds issued by the water companies are low. The average, for example, of A rated bonds is currently 0.8%. These spreads are lower than has been typical in preceding years. The spread differential between A rated and BBB rated bonds has been more volatile than the spread of A rated bonds over gilts, ranging from 30 to 70 basis points over A rated bonds depending on market conditions.

Our range for debt spread is 0.8% to 1.4%, but our view is that the bottom of the range would represent historically low borrowing costs.

Evidence on the cost of debt

The cost of debt under the CAPM framework is assessed in relation to the premium required over the risk-free rate.

The main sources of evidence for the assumptions made on the cost of debt put forward by the companies are:

- regulatory precedent for the risk-free rate, combined with analysis of debt spreads for appropriate bond comparators, predominantly single-A rated companies (as a proxy for the debt premium); and

- the cost of debt faced by the companies themselves (this is the basis of the real pre-tax cost of debt estimated by NERA in its final report to be 4.0%). These estimates have been based on the average cost of debt faced by the companies, or the cost of new financing.

In their final plans the average pre-tax cost of debt (excluding any embedded debt premium) assumed by the water and sewerage companies is approximately 4.1%, broadly in line with

NERA's 4.0% best estimate. The range is 3.75% to 4.5%. The average for the water only companies is higher and the range wider because of the impact of the small company premium on debt.

Some companies have included specific premiums in their assessment of the cost of debt. Four water and sewerage companies and one water only company explicitly include new issuance costs ranging from 0.1% to 0.25%. Another has added a 0.15% premium to account for the costs of maintaining undrawn credit facilities and a cash cushion. For other companies, to the extent they have been considered, these costs are implicitly included in their overall cost of debt.

Our range for the real pre-tax cost of debt for water and sewerage companies is 3.3% to 4.3%. We have used 4.3% (including issuance costs) as our point estimate (or 6.8% on a nominal basis). This assessment has placed greater emphasis on longer term historic averages for both the risk-free rate and debt premium. Consequently, the arguments for an embedded debt premium are much weaker. Our conclusions on embedded debt are set out in chapter 15.

Our analysis of the 2003-04 June returns suggests that the current industry interest costs are lower than the nominal cost that our WACC would imply. For financeability purposes, in modelling interest costs, we have therefore assumed a lower cost of debt in 2005-06 of 6.4%, which is consistent with the industry average interest costs included in the final plans. We trend to the level implied by the WACC by 2009-10.

Evidence on the equity risk premium

Under the CAPM model the return on equity consists of the risk-free rate and the product of equity beta and the equity risk premium (ERP). This captures the additional risk associated with equity investments generally.

Estimation of the ERP always confronts major uncertainties. The Smithers (2003) study estimates a value based on historic UK and US data in the range 3% to 5% depending on whether an arithmetic or geometric average is used. NERA's estimate in its final report for the ERP is 5%. It presents a range of market, academic and regulatory precedent as evidence to support this value. Dimson, Marsh and Staunton (2003) (who adopt a global rather than country-specific approach) similarly present a forward-looking ERP in the order of 3% on a geometric basis and around 5% on an arithmetic basis.

Many of the companies that have reported a separate ERP have used a figure of 5%, based on the NERA study. However, there are a few outliers who use their own estimates which are higher than any of those used by other companies, regulatory precedent or academic research.

Ofgem uses a range of 2.5% to 4.5% in its March 2004 report, stating that this is consistent with the most recent decisions from the Competition Commission.

Our advisors conclude that the evidence supports a feasible range of 3.5% to 5.0%, with the very top end of the range being more appropriate.

Our advisors, like others, highlight the difficulty in reaching a precise level of the ERP. This was also an issue in the Smithers (2003) report, which suggests that difficulties in estimating the risk-free rate separately from the ERP are best overcome by examining historical overall equity returns. The Smithers study summarises a range of evidence that equity returns have, over reasonably large samples, been fairly stable over time and across different markets.

The report estimates the equity return overall as 6.5% to 7.5% on an arithmetic average basis.

At the time of our draft determinations in August 2004 the current yields of water companies were around 6% or less – this was somewhat lower than the yields underpinning NERA's estimate. At that time some analysts noted that the companies were trading at or close to their regulatory capital values. Yields since our draft determinations have fallen on the back of share price appreciation. There have been several factors affecting water companies' share prices.

Evidence on equity betas

Equity beta values for the listed water companies have fallen sharply since 1996 in common with other regulated utilities in the UK. There was a temporary increase at the time of the last price review followed by further declines until 2003. Since then there has been a slight rise. The equity beta has been as low as 0.3 in 2002-03 and as high as 1.1 in 1997. Since July 2004 equity betas have averaged just under 0.4. Since our draft determinations, average equity betas have been relatively stable.

There are difficulties in interpreting equity beta values. Taken at face value the decline in the measured betas would imply that the equity market regards investment in water stocks since the 1999 review as considerably less risky than before it. Our view is that although we have taken steps to reduce regulatory uncertainty the low beta factors are unlikely to reflect a real decrease in the riskiness of the water sector but are more likely a statistical product of the increase in market volatility.

The Competition Commission adopted a value for the equity beta in the range 0.7 to 1 in its decisions on the two water price limits references in 2000, despite the evidence of declining measured betas.

Ofgem used a range of 0.6 to 1 in its electricity distribution price control review document. Work undertaken by Smithers and Co Ltd (2004) for Ofgem points to strong evidence of betas for utility companies not being stable over time. In these circumstances it suggests that regulators may want to consider giving more weight to an unconditional expectation of beta of 1.

NERA uses an estimate of 1.05 for the equity beta in its CAPM-derived estimate of the cost of capital for water and sewerage companies of 5.1% post-tax. NERA derives this equity beta from an asset beta for the industry of 0.42 and assumed gearing of 60%. Its analysis relies on the exclusion of all but two companies' data because of alleged liquidity distortions and on adjustment of raw beta values to take account of regulatory events and of recent high market volatility. NERA concludes that once the adjustments are made, the values used at the last review and since then by the Competition Commission are appropriate. NERA admits to low confidence in this beta value, but also notes that recent regulatory precedent has been to adopt beta values that accord with broader market evidence rather than to rely on mechanical computation within a strict CAPM framework. These arguments are consistent with NERA placing greater weight than previously on the dividend growth model approach to estimating the cost of equity.

All of the water and sewerage companies and all but two of the water only companies that have specifically stated an equity beta assume a value of 1.0 in their final plans, broadly in line with NERA's estimate. Where companies have not relied on the NERA report, evidence is taken from UK and international historic trends, regulatory precedent and various studies.

However, the estimates provided by the remaining two water only companies are outliers, assuming equity betas of 1.47 and 1.35. In neither case is the higher number well justified.

Companies' equity beta assumptions are not directly comparable due to differing assumptions for the level of gearing.

We have assumed an equity beta of 1 at a gearing of 55%.

Other evidence on the overall cost of equity

Companies' estimates of the cost of equity fall within a very wide range of between 6.6% and greater than 11.2% (on a post-tax basis).

All companies argue that the cost of equity has increased since the 1999 review. Companies have based their arguments for a higher return on equity on evidence of market to asset ratios (ie the comparison of market valuation of the company to the regulatory capital value). Companies consider that their share prices have been trading below those implied by their regulatory capital values and levels of gearing since the 1999 review, although the discount has narrowed over the last 18 months. Companies have attributed the whole of the effect of this discount to the cost of equity allowed at the 1999 review.

Share prices in the utilities sector as a whole have also performed strongly since our draft determinations were published in August 2004. Some analysts believe that some water companies are currently trading above their regulatory capital values. The upward trend in share prices does not appear to support a position that the cost of capital allowed at the draft determinations is too low.

Evidence from corporate transactions since the last review suggests that companies have been valued at or just below their regulatory capital values. This again suggests that a higher cost of equity could be appropriate. Given its size, the recent takeover of South Staffordshire at a significant premium to its regulatory capital value cannot be used to deduce industry-wide trends.

The recent rights issue undertaken by United Utilities provides specific evidence on the cost of equity but it is hard to generalise from the specifics of this deeply discounted transaction.

NERA's final report gives significantly greater weight to an estimate of the cost of equity using the dividend growth model. NERA has combined actual dividend yields since the last review (up to 2003) averaging around 7.5% and long-term 'normal' dividend growth rate of 2.2 in computing the cost of equity. This will tend to overestimate the cost of equity during a period when yields are higher than the norm.

As set out in chapter 15 we have considered a wide range of evidence in coming to a final view of the appropriate range for the cost of equity. Our consultants advised us that there are a number of pieces of evidence that support a cost of equity range higher than straight application of CAPM. The evidence suggests a range for the real post-tax cost of equity of 7.25%-8.3% based on market evidence. This is higher than our CAPM-derived range of 6.7%-8%.

As with the CAPM framework, the wider evidence needs to be carefully weighed and the underlying assumptions tested. Whilst we consider it is necessary to assess the robustness of CAPM parameters, we do not think a cost of equity of greater than 8.0% is well supported. However, we do believe that the wider evidence points to using a cost of equity towards the top of our CAPM-derived range.

Views on the small company premium

NERA has also produced a report 'Recent evidence on the small water only company WACC premium', (April 2003) for the water only companies. This examines the need for and the size of any premium on the WACC required by small companies, so that they can maintain access to the capital markets. The report presents evidence of higher transaction costs and higher relative flotation costs on the equity side. It also argues that small companies face higher debt costs, shown by wider spreads in publicly traded debt, more limited access to different sources of finance and a size effect on credit ratings. It concludes that the smallest companies require a 1.4% premium to the cost of equity and between 0.35% and 0.63% to the post-tax cost of debt. This equates to a post-tax premium of between 0.88% and 1.02% on the WACC (assuming 50% gearing). NERA estimates an intermediate premium on the total WACC of around 0.53% for the larger water only companies (Three Valleys and South East), composed of 0.7% to the cost of equity and 0.28-0.42% to the cost of debt. These premiums are higher than those allowed at the last price review of 0.75% and 0.4% (fully post-tax) respectively.

Companies' expectations in their final business plans for the small company premium ranged from 0.54% to 1.00% fully post-tax and were largely based on this NERA study. One of the smaller water and sewerage companies also suggested that it needed a premium on the basis that its equity trading costs were much higher than for larger companies.

In 'The small water company cost of capital premium: updated evidence and a response to MD190' (May 2004), NERA updates its estimates for the smaller water only companies. It raises its assessment of the equity premium for these companies to 1.55%, while the post-tax debt premium is slightly lower at 0.35-0.53%. This equates to an overall fully post-tax premium of 0.83-0.94%, assuming 60% gearing – slightly lower than its original estimate.

In September 2004, NERA produced an updated report, 'The small company cost of capital premium: a response to Ofwat's draft determination'. This provided further argument in support of the assumptions underlying its May 2004 estimates. In October 2004 NERA updated its analysis of empirical data on average holding periods for water only company shares, giving results more in line with those suggested by our analysis. NERA continued to support its May 2004 estimates of the equity premium, however, stating that empirical evidence on holding periods was less relevant than theoretical arguments for assuming a five-year holding period.

In coming to our conclusions on the small company premium, we have also taken account of evidence from Three Valleys' bond issue in June 2004 (on debt) and evidence on trading volumes for the shares of the quoted water only companies (on equity).

We have allowed for a small company premium as set out in chapter 15.

Appendix 6 Aggregate five-year financial information for each company

This table summarises the financial projections underpinning the price limits for each company. The figures are for the five-year aggregates (2005-10) and are in £ millions.

				Analysis of the revenue requirement (£ million)					
	Total revenue after OPA	OPA	**Revenue before OPA**	Operating costs	Infrastructure renewals charge	Current cost depreciation	Return on capital (including financeability) [1]	Taxation	**Total revenue requirement**
Water and sewerage companies									
Anglian	3,951	4	**3,947**	1,510	212	887	1,272	65	**3,947**
Dŵr Cymru	2,634	2	**2,632**	1,015	247	483	880	7	**2,632**
Northumbrian	2,501	0	**2,501**	1,014	164	481	733	109	**2,501**
Severn Trent	5,482	5	**5,478**	2,062	394	1,199	1,471	351	**5,478**
South West	1,757	-1	**1,759**	561	96	382	632	88	**1,759**
Southern	2,677	0	**2,677**	875	183	808	781	31	**2,677**
Thames	6,485	0	**6,485**	2,492	433	1,504	1,769	287	**6,485**
United Utilities	6,022	-5	**6,028**	1,997	471	1,400	1,843	317	**6,028**
Wessex	1,639	1	**1,638**	542	103	381	544	68	**1,638**
Yorkshire	3,406	3	**3,403**	1,184	173	739	1,076	231	**3,403**
Water and sewerage total	**36,556**	**8**	**36,548**	**13,252**	**2,477**	**8,264**	**11,001**	**1,555**	**36,548**
Water only companies									
Bournemouth & W Hampshire	163.3	0.1	**163.2**	72.3	7.9	33.6	36.2	13.2	**163.2**
Bristol	379.4	0.6	**378.8**	180.8	45.3	67.6	71.4	13.8	**378.8**
Cambridge	82.1	0.1	**82.0**	44.7	8.9	8.5	15.7	4.2	**82.0**
Dee Valley	84.2	0.1	**84.1**	42.6	7.8	15.7	16.8	1.1	**84.1**
Folkestone & Dover	77.7	0.2	**77.5**	35.3	4.0	14.2	19.2	4.8	**77.5**
Mid Kent	214.4	0.2	**214.2**	86.7	18.8	39.8	68.8	0.0	**214.2**
Portsmouth	149.3	0.4	**148.9**	78.0	17.7	18.8	30.6	3.8	**148.9**
South East	534.4	0.9	**533.5**	223.3	48.9	95.4	146.2	19.6	**533.5**
South Staffordshire	323.2	1.1	**322.1**	170.4	33.6	54.1	54.1	9.9	**322.1**
Sutton & East Surrey	217.6	0.2	**217.4**	103.3	26.5	37.4	43.6	6.7	**217.4**
Tendring Hundred	65.1	0.3	**64.8**	26.8	6.0	9.0	16.2	6.8	**64.8**
Three Valleys	967.5	0.8	**966.7**	451.9	135.1	144.0	186.5	49.2	**966.7**
Water only total	**3,258.3**	**5.0**	**3,253.3**	**1,516.2**	**360.4**	**538.2**	**705.4**	**133.1**	**3,253.3**
Industry total	**39,815**	**13**	**39,801**	**14,768**	**2,838**	**8,802**	**11,706**	**1,688**	**39,801**

1 This is stated net of the current cost working capital adjustment for each company. For the industry as a whole, this amounts to a reduction of £43 million for the five years.

Appendix 7 Regulatory capital value: movement between 2005-06 to 2009-10

The tables below show the movement in companies' regulatory capital value from 2005 to 2010. All figures are £ million and are in 2002-03 financial year end prices.

The closing values at 31 March 2005 are the same as were previously published in RD05/04 but have been adjusted to a 2002-03 year end price base.

Anglian

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	4,128					
Opening adjustments	15					
Regulatory capital value as at 1 April	**4,143**	**4,153**	**4,221**	**4,320**	**4,387**	**4,143**
Net new investment (after depreciation) from 2005 to 2010	37	95	127	94	66	420
Adjustment for roll-out of past capital efficiency	-27	-27	-27	-27	-27	-137
Regulatory capital value as at 31 March	**4,153**	**4,221**	**4,320**	**4,387**	**4,426**	**4,426**

Dŵr Cymru

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	2,614					
Opening adjustments	71					
Regulatory capital value as at 1 April	**2,685**	**2,806**	**2,914**	**2,994**	**3,043**	**2,685**
Net new investment (after depreciation) from 2005 to 2010	141	127	99	69	36	472
Adjustment for roll-out of past capital efficiency	-19	-19	-19	-19	-19	-97
Regulatory capital value as at 31 March	**2,806**	**2,914**	**2,994**	**3,043**	**3,059**	**3,059**

Northumbrian

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	2,248					
Opening adjustments	83					
Regulatory capital value as at 1 April	**2,331**	**2,421**	**2,480**	**2,524**	**2,552**	**2,331**
Net new investment (after depreciation) from 2005 to 2010	92	60	46	30	5	233
Adjustment for roll-out of past capital efficiency	-2	-2	-2	-2	-2	-9
Regulatory capital value as at 31 March	**2,421**	**2,480**	**2,524**	**2,552**	**2,556**	**2,556**

Severn Trent

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	4,672					
Opening adjustments	122					
Regulatory capital value as at 1 April	**4,794**	**4,853**	**4,981**	**5,107**	**5,191**	**4,794**
Net new investment (after depreciation) from 2005 to 2010	102	171	171	127	145	716
Adjustment for roll-out of past capital efficiency	-44	-44	-44	-44	-44	-218
Regulatory capital value as at 31 March	**4,853**	**4,981**	**5,107**	**5,191**	**5,292**	**5,292**

South West

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	1,762					
Opening adjustments	86					
Regulatory capital value as at 1 April	**1,847**	**1,929**	**1,994**	**2,042**	**2,095**	**1,847**
Net new investment (after depreciation) from 2005 to 2010	88	71	56	59	48	322
Adjustment for roll-out of past capital efficiency	-7	-7	-7	-7	-7	-33
Regulatory capital value as at 31 March	**1,929**	**1,994**	**2,042**	**2,095**	**2,136**	**2,136**

Southern

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	2,258					
Opening adjustments	-43					
Regulatory capital value as at 1 April	**2,215**	**2,324**	**2,565**	**2,755**	**2,864**	**2,215**
Net new investment (after depreciation) from 2005 to 2010	100	233	181	101	34	649
Adjustment for roll-out of past capital efficiency	9	9	9	9	9	44
Regulatory capital value as at 31 March	**2,324**	**2,565**	**2,755**	**2,864**	**2,908**	**2,908**

Thames

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	4,884					
Opening adjustments	291					
Regulatory capital value as at 1 April	**5,175**	**5,435**	**5,722**	**5,929**	**6,113**	**5,175**
Net new investment (after depreciation) from 2005 to 2010	298	325	246	222	219	1309
Adjustment for roll-out of past capital efficiency	-38	-38	-38	-38	-38	-192
Regulatory capital value as at 31 March	**5,435**	**5,722**	**5,929**	**6,113**	**6,293**	**6,293**

United Utilities

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	5,389					
Opening adjustments	332					
Regulatory capital value as at 1 April	**5,721**	**5,863**	**6,086**	**6,262**	**6,299**	**5,721**
Net new investment (after depreciation) from 2005 to 2010	178	259	212	73	2	725
Adjustment for roll-out of past capital efficiency	-36	-36	-36	-36	-36	-181
Regulatory capital value as at 31 March	**5,863**	**6,086**	**6,262**	**6,299**	**6,265**	**6,265**

Wessex

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	1,535					
Opening adjustments	94					
Regulatory capital value as at 1 April	**1,629**	**1,692**	**1,749**	**1,793**	**1,819**	**1,629**
Net new investment (after depreciation) from 2005 to 2010	86	80	67	48	28	309
Adjustment for roll-out of past capital efficiency	-23	-23	-23	-23	-23	-114
Regulatory capital value as at 31 March	**1,692**	**1,749**	**1,793**	**1,819**	**1,824**	**1,824**

Yorkshire

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	3,141					
Opening adjustments	101					
Regulatory capital value as at 1 April	**3,242**	**3,392**	**3,502**	**3,601**	**3,679**	**3,242**
Net new investment (after depreciation) from 2005 to 2010	174	136	123	103	60	596
Adjustment for roll-out of past capital efficiency	-25	-25	-25	-25	-25	-124
Regulatory capital value as at 31 March	**3,392**	**3,502**	**3,601**	**3,679**	**3,714**	**3,714**

Bournemouth and West Hampshire

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	107.3					
Opening adjustments	8.0					
Regulatory capital value as at 1 April	**115.3**	**113.9**	**112.3**	**111.9**	**112.4**	**115.3**
Net new investment (after depreciation) from 2005 to 2010	0.0	-0.2	1.0	1.9	0.5	3.3
Adjustment for roll-out of past capital efficiency	-1.4	-1.4	-1.4	-1.4	-1.4	-7.0
Regulatory capital value as at 31 March	**113.9**	**112.3**	**111.9**	**112.4**	**111.5**	**111.5**

Bristol

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	221.9					
Opening adjustments	-9.4					
Regulatory capital value as at 1 April	**212.4**	**216.3**	**229.2**	**232.8**	**224.7**	**212.4**
Net new investment (after depreciation) from 2005 to 2010	4.3	13.3	3.9	-7.7	-4.4	9.3
Adjustment for roll-out of past capital efficiency	-0.4	-0.4	-0.4	-0.4	-0.4	-1.8
Regulatory capital value as at 31 March	**216.3**	**229.2**	**232.8**	**224.7**	**219.9**	**219.9**

Cambridge

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	45.6					
Opening adjustments	0.3					
Regulatory capital value as at 1 April	**45.9**	**46.0**	**46.3**	**46.6**	**46.8**	**45.9**
Net new investment (after depreciation) from 2005 to 2010	0.1	0.2	0.3	0.1	-0.2	0.4
Adjustment for roll-out of past capital efficiency	0.1	0.1	0.1	0.1	0.1	0.4
Regulatory capital value as at 31 March	**46.0**	**46.3**	**46.6**	**46.8**	**46.7**	**46.7**

Dee Valley

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	44.7					
Opening adjustments	1.8					
Regulatory capital value as at 1 April	**46.5**	**50.5**	**53.2**	**51.3**	**48.7**	**46.5**
Net new investment (after depreciation) from 2005 to 2010	4.6	3.3	-1.2	-2.0	-2.6	2.2
Adjustment for roll-out of past capital efficiency	-0.6	-0.6	-0.6	-0.6	-0.6	-3.2
Regulatory capital value as at 31 March	**50.5**	**53.2**	**51.3**	**48.7**	**45.5**	**45.5**

Folkestone & Dover

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	51.7					
Opening adjustments	-1.3					
Regulatory capital value as at 1 April	**50.5**	**54.2**	**58.1**	**57.1**	**55.8**	**50.5**
Net new investment (after depreciation) from 2005 to 2010	4.4	4.6	-0.4	-0.6	-0.3	7.6
Adjustment for roll-out of past capital efficiency	-0.7	-0.7	-0.7	-0.7	-0.7	-3.3
Regulatory capital value as at 31 March	**54.2**	**58.1**	**57.1**	**55.8**	**54.8**	**54.8**

Mid Kent

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	182.3					
Opening adjustments	-0.3					
Regulatory capital value as at 1 April	**182.0**	**196.1**	**210.2**	**216.4**	**225.8**	**182.0**
Net new investment (after depreciation) from 2005 to 2010	13.6	13.7	5.7	8.9	7.0	49.0
Adjustment for roll-out of past capital efficiency	0.5	0.5	0.5	0.5	0.5	2.3
Regulatory capital value as at 31 March	**196.1**	**210.2**	**216.4**	**225.8**	**233.3**	**233.3**

Portsmouth

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	86.1					
Opening adjustments	2.7					
Regulatory capital value as at 1 April	**88.8**	**88.4**	**92.7**	**94.3**	**92.7**	**88.8**
Net new investment (after depreciation) from 2005 to 2010	1.7	6.4	3.7	0.6	-1.5	10.9
Adjustment for roll-out of past capital efficiency	-2.1	-2.1	-2.1	-2.1	-2.1	-10.7
Regulatory capital value as at 31 March	**88.4**	**92.7**	**94.3**	**92.7**	**89.1**	**89.1**

South East

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	439.0					
Opening adjustments	12.7					
Regulatory capital value as at 1 April	**451.7**	**468.7**	**479.6**	**473.5**	**459.9**	**451.7**
Net new investment (after depreciation) from 2005 to 2010	25.6	19.4	2.5	-5.1	-5.0	37.4
Adjustment for roll-out of past capital efficiency	-8.5	-8.5	-8.5	-8.5	-8.5	-42.7
Regulatory capital value as at 31 March	**468.7**	**479.6**	**473.5**	**459.9**	**446.3**	**446.3**

South Staffordshire

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	158.2					
Opening adjustments	6.2					
Regulatory capital value as at 1 April	**164.4**	**168.7**	**171.9**	**174.1**	**174.0**	**164.4**
Net new investment (after depreciation) from 2005 to 2010	4.1	3.0	2.0	-0.2	0.0	8.9
Adjustment for roll-out of past capital efficiency	0.2	0.2	0.2	0.2	0.2	1.0
Regulatory capital value as at 31 March	**168.7**	**171.9**	**174.1**	**174.0**	**174.2**	**174.2**

Sutton & East Surrey

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	126.8					
Opening adjustments	0.7					
Regulatory capital value as at 1 April	**127.5**	**131.5**	**134.6**	**134.5**	**135.8**	**127.5**
Net new investment (after depreciation) from 2005 to 2010	5.4	4.5	1.3	2.7	0.8	14.8
Adjustment for roll-out of past capital efficiency	-1.4	-1.4	-1.4	-1.4	-1.4	-7.1
Regulatory capital value as at 31 March	**131.5**	**134.6**	**134.5**	**135.8**	**135.2**	**135.2**

Tendring Hundred

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	52.3					
Opening adjustments	-3.0					
Regulatory capital value as at 1 April	**49.3**	**48.2**	**47.5**	**48.5**	**49.7**	**49.3**
Net new investment (after depreciation) from 2005 to 2010	-1.0	-0.6	1.1	1.3	-0.1	0.7
Adjustment for roll-out of past capital efficiency	-0.1	-0.1	-0.1	-0.1	-0.1	-0.5
Regulatory capital value as at 31 March	**48.2**	**47.5**	**48.5**	**49.7**	**49.5**	**49.5**

Three Valleys

£m (2002-03 financial year end prices)	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
Closing regulatory capital value at 31 March 2005	575.2					
Opening adjustments	4.5					
Regulatory capital value as at 1 April	**579.7**	**594.6**	**620.6**	**633.8**	**642.4**	**579.7**
Net new investment (after depreciation) from 2005 to 2010	12.9	23.9	11.2	6.6	3.7	58.2
Adjustment for roll-out of past capital efficiency	2.0	2.0	2.0	2.0	2.0	10.2
Regulatory capital value as at 31 March	**594.6**	**620.6**	**633.8**	**642.4**	**648.2**	**648.2**

Appendix 8 Price base

Figures quoted in this report are expressed in 2002-03 prices except for customer bills. Customer bills are presented in current prices in line with bills customers receive for 2004-05.

In the business plans companies prepared the bill projections in financial year average 2002-03 prices, as specified in our reporting requirements.

In this document where we present the business plan bills we have adjusted the figures to 2004-05 prices using the indexation as follows:

Tariff basket year RPI for 2004-05	182.70 (November 2003)
Financial year average RPI for 2002-03	177.50
Indexation adjustment	182.70 / 177.50 = 1.0293

The business plan figures are multiplied by the indexation adjustment.

Glossary of terms and definitions

Abstraction: The removal of water from any source, either permanently or temporarily.

Building Cost Information Service (Ltd) BCIS: A company of the Royal Institution of Chartered Surveyors that provides statistical analyses of current prices and cost samples from the UK building and construction industry.

Capital asset pricing model (CAPM): An economic model used to provide an estimate of the expected rate of return on a financial investment. One of the cornerstones of modern finance theory.

Charging year: The period for which companies bill customers which commences on 1 April each year.

Competition Commission: The body to whom companies can appeal if they disagree with Ofwat's determinations of their price limits, licence amendments or accounting guidelines.

Covenants: Conditions attached to debt, which aim to protect lenders' capital and interest payments. Covenants set out the action lenders may require, for example restricting dividend payments or preventing new lending, if certain triggers are met. Such triggers might include financial ratios falling below certain levels, indicating a weakening of the company's financial position.

Credit quality: The probability that an issuer of debt will make the promised payments to lenders. Credit rating agencies such as Standard and Poor's, Moody's and Fitch Ratings issue credit quality ratings as a service to investors. They take into account investors' demand for a higher return on bonds from issuers with lower credit quality as compensation for the greater risk of default.

Cryptosporidium: A micro-organism, chiefly originating from livestock, commonly found in lakes and rivers which is highly resistant to disinfection in the water treatment process.

Data envelopment analysis (DEA): A method based on linear programming used to assess the relative efficiency of operating units with the same goals and objectives. DEA allows us to measure the comparative efficiency with which operating units (eg water companies) transform resources and/or environmental factors to useful outcomes.

Depreciation: Depreciation is a measure of the consumption, use or wearing out of an asset over the period of its useful economic life.

Diffuse pollution: Pollution from widespread activities with no one discrete source, eg nitrate, pesticides, urban run-off, etc.

Distribution mains: The pipework by which water is delivered to customers. Water companies are responsible for the water mains.

Dividend cover: The number of times a company's dividends to ordinary shareholders could be paid out of net profits after tax in the same period.

Dividend growth model (DGM): A financial model used to provide an estimate of equity returns by reference to the expected growth in dividends.

Embedded debt: Debt, due in more than one year, in company balance sheets as at 31 March 2004, which attracts a fixed rate of interest rather than a floating rate.

Engineering judgement grades (EJGs): Used to assign both a reliability and accuracy grade to each individual cost in the cost base. For example, for the cost base an EJG of A1 would define a standard cost where the company has considerable experience in its own region and can call on data from a series of similar completed projects (Reliability grade A), and the standard cost represents works where reliable company-specific data is available and site-specific factors have been made accurately (Accuracy band 1). An EJG of D4 (the lowest) might be assigned to a standard cost based on national estimates for work not usually carried out by the company.

Enhanced service levels: Permanent, identifiable and measurable improvements in service levels that are above the most recent established company-wide base levels of service and which are additional to improvements resulting from expenditure in other purpose categories.

Equity beta: A coefficient (ie a number) that measures the riskiness of equity capital. Individual equity shares may be more or less risky than the overall equity market. The riskiness of a share, as measured by beta, is the volatility of its price in relation to that of a market portfolio. The beta factor is a component of the capital asset pricing model, which we use as the framework for estimating the cost of equity capital. A beta of 1 implies that the company's share price changes at the same rate as prices in the market as a whole. A lower beta implies that the company's share price is less susceptible to changes in the return than the market as a whole, while a higher beta indicates that the price is more volatile than that of the market.

Equity market risk premium (ERP): The difference between the expected return on the equity market portfolio and the risk free return. The additional return is required by investors to reflect the extra risk of the equity instruments compared with Government issued securities.

Financial Reporting Standards (FRS): Authoritative statements of how particular types of transaction and other events should be reflected in financial statements and accordingly compliance with accounting standards will normally be necessary for financial statements to give a true and fair view. FRSs are issued or adopted by the Accounting Standards Board (ASB).

Gearing: A company's net debt expressed as a percentage of its total capital. We use net debt as a percentage of the regulatory capital value as our measure of gearing. Other common measures include the ratio of net debt to net debt plus equity expressed as a percentage.

Geometric average: A compounded average that is time weighted for a specified time period.

Incentive allowance: The operating expenditure incentive allowance allows companies to retain the benefit of their past incremental outperformance against the operating expenditure assumptions in price limits for five years. After five years customers will benefit from the lower costs. The allowance is added to companies' revenue requirement and hence included in price limits. There is a similar mechanism for outperformance of capital expenditure assumptions.

Infrastructure charges: Paid by developers and customers in properties (in addition to connection charges) for a first time connection of premises for domestic purposes to a public water supply or public sewer.

Infrastructure renewals charge: An annual accounting provision for the cost of renewing infrastructure assets (ie mainly underground pipes) charged to the profit and loss account.

Interim determinations: Condition B of the licence allows Ofwat to make adjustments to the price limit in any year for certain relevant changes of circumstances or in response to a notified item, provided these are material. Key variations are: for changes in legal obligations placed on companies; failure to achieve legal requirements allowed for when price limits were set; and to allow for differences between the actual proceeds of surplus land and the proceeds assumed when price limits were last set.

Investment grade credit quality: A company with investment grade credit quality has a credit rating of BBB- or above (Standard and Poor's/Fitch Ratings), or Baa3 or above (Moody's). A company with a credit rating below investment grade will find it expensive to raise new finance, as investors will perceive it as high risk (see 'Credit quality').

K factors: The annual increase in charges that companies can make. The amount by which a company can increase (or must decrease) its charges is controlled by the price limit formula RPI ± K + U. K is a number determined by Ofwat for each company, usually at a price review, for each year to reflect what it needs above inflation in order to finance the provision of services to customers. RPI is expressed as the percentage increase in the Retail Price Index in the year to the November before the charging year and U is the amount of K not taken up in previous years.

Large users: In general terms, large users are industrial and commercial customers using significant amounts of water each year. Under the Competition and Service (Utilities) Act 1992, amended by the Water and Sewerage Undertakers (Inset appointments) Regulations 2000 [SI2000/1842], inset appointments can be granted to sites using 100 megalitres or more a year in England and 250 megalitres or more a year in Wales.

Lending triggers: See 'Covenants'.

Logging down/logging up: The process between price reviews enabling companies to set aside variations in costs, which are then taken into account when next setting price limits.

Market to asset ratio (MAR): A measure of the relationship between the market value of a company's invested capital (equity and debt) and the value of its assets – in the case of a water company, its regulatory capital value. As the market value of equity varies with a company's share price, the MAR can give an insight into how equity investors perceive quoted water companies. For example, it may reflect a company's performance against our efficiency assumptions and investors' views on whether the rate of return we allow the company to earn on its regulatory capital value is equal to their view of the required return.

Policy codes: Cost driver or alphanumeric codes defined by Ofwat, the Environment Agency and Defra, and used by companies to assign projects and expenditure to specific quality policies and obligations. A detailed list explaining these codes can be found in the 'Business plan 2004: Information requirements – Final definitions' which is on our website, with cross-references to the relevant Environment Agency documents.

Quality regulators: A collective term for the Drinking Water Inspectorate, the Environment Agency, English Nature and the Countryside Council for Wales.

Regulatory capital value: The capital base used in setting price limits. The value of the appointed business which earns a return on investment. It represents the initial market value (200-day average), including debt at privatisation, plus subsequent net new capital expenditure including new obligations imposed since 1989. The capital value is calculated

using our methodology (ie after current cost depreciation and infrastructure renewals accrual).

Retail Price Index (RPI): Charges are controlled by the formula RPI ± K. RPI is expressed as the percentage increase in the Retail Price Index in the year to the November before the charging year.

Risk-free rate: The risk-free rate is normally measured on the real return on a government security.

Small company premium: A premium on the basic cost of capital that we allow for the water only companies to ensure that they can maintain access to the capital markets.

Security of supply index: Assesses each company's ability to supply customers in dry years without imposing demand restrictions such as hosepipe bans. Companies with higher index score bands have better security of supply.

Serviceability: A long-run approach, which considers the ability of the water and sewerage networks to maintain a standard of service to customers.

Stable credit quality: A company with stable credit quality maintains a fairly constant credit rating over time (see 'Credit quality').

Stochastic frontier analysis: A method of regression analysis where the difference between the predicted cost (from the regression) and the actual costs are assumed to measure both inefficiency as well as stochastic or random error.

Target headroom: The minimum buffer a water company should allow between supply and demand to cater for specified uncertainties.

Tariff basket: The basket of charges to which the annual regulatory price limits apply comprising: charges for unmeasured water supply; charges for measured water supply; charges for unmeasured sewerage services; charges for measured sewerage services; and charges for reception, treatment and disposal of trade effluent.

Tariff basket headroom effect: The increase in a company's unmeasured charges is calculated using the average charge per supply. When this reduces, for example when a company introduces a new charge that is below the average, the company has scope ('headroom') to increase its charges to all of its customers. This is known as the tariff basket headroom effect.

WaSC: Water and sewerage company.

Water resource zone level: The largest possible zone in which all water resources, excluding external transfers, can be shared. Hence, it is the zone in which all customers experience the same risk of supply failure from a resource shortfall.

Weighted average cost of capital (WACC): For a company, the average of its cost of debt and cost of equity capital, weighted according to the balance of debt and equity which finances the company's assets.

WoC: Water only company. Provides water but not sewerage services.

Office of Water Services
Centre City Tower, 7 Hill Street, Birmingham B5 4UA
Telephone: 0121 625 1300 Fax: 0121 625 1400
Website: www.ofwat.gov.uk
e-mail: enquiries@ofwat.gsi.gov.uk
ISBN: 1 904655 18 1

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