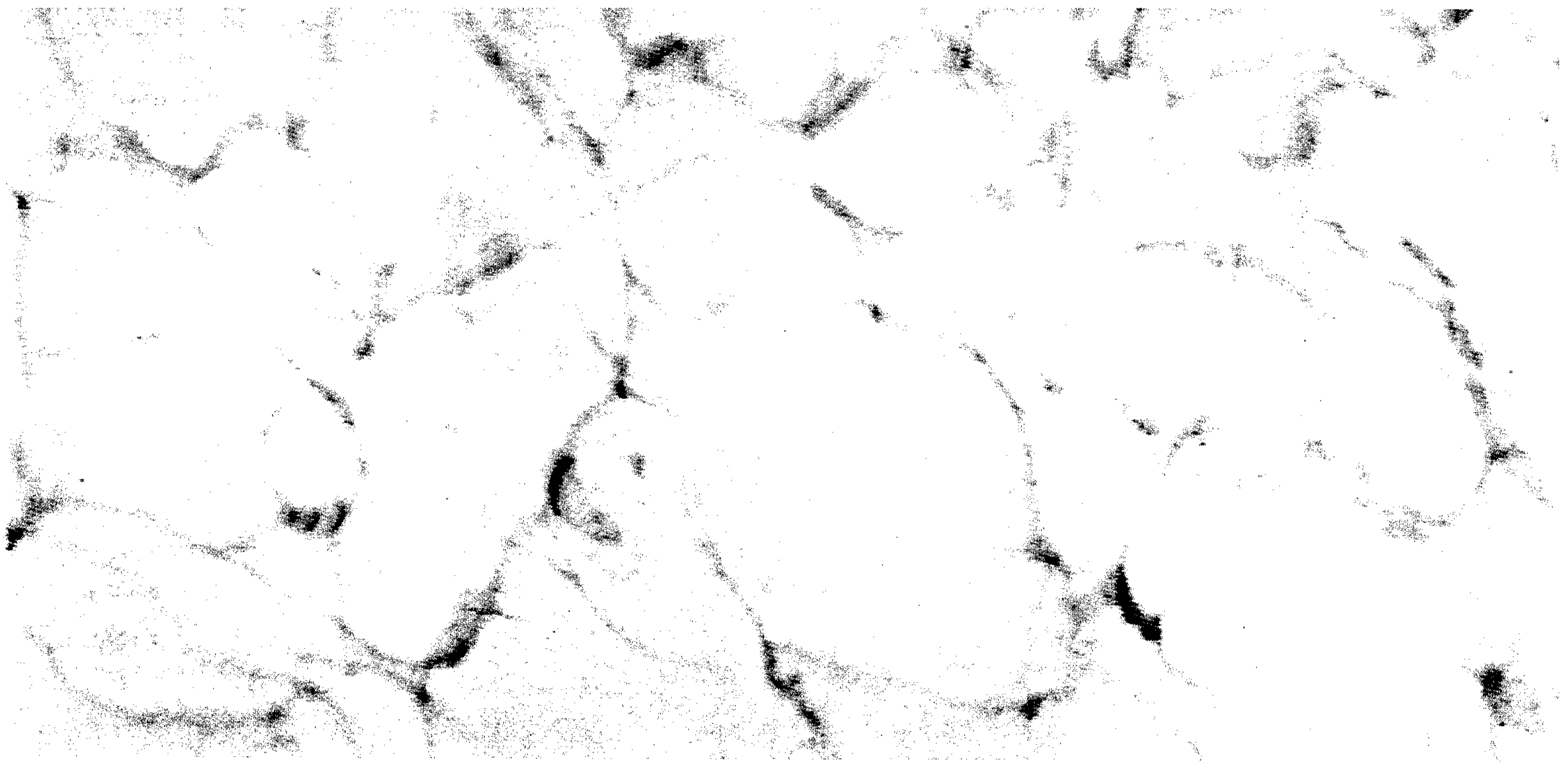
Future Charges for Water and Sewerage Services



The outcome of the Periodic Review

OFWAT

ERRATA - FUTURE CHARGES FOR WATER AND SEWERAGE SERVICES

Table 2, page 6: Comparison of price limits

Column 1
Previous limit set in 1989:

1. South West Water - should read 5.0 not 5.5
2. Bournemouth and W Hampshire - should read 1.0 not 1.8

Future Charges for Water and Sewerage Services

The outcome of the Periodic Review

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FOREWORD

This first Periodic Review, which is a reassessment and resetting of price limits for the 31 water, and water and sewerage companies in England and Wales, has taken place within the regulatory framework laid down by Parliament.

In making my determinations, I have to act so that companies are able to operate on a sound financial basis and achieve reasonable returns. Subject to that, I must also look after the interests of customers. Achieving a balance between these duties, and between the various interests, has required careful judgement.

Price limits

Increases in prices are limited by a formula RPI + K (as set out in the Licence), where the Retail Price Index (RPI) represents inflation and K is a company-specific number which limits the permitted annual increase in average charges above the rate of inflation. My determinations relate solely to K factors and to the limits on infrastructure charges which companies are able to levy on new properties connected for domestic water or sewerage services. Subject to these limits, the regulatory regime gives companies incentives to pursue their objectives, including their statutory obligations, as efficiently as possible.

A consultative process

Throughout the Periodic Review, I have been open and consultative in setting out my objectives and developing my approach to setting new price limits. In particular, I have sought to involve the companies, their customers, the quality regulators, the Secretaries of State for the Environment and for Wales, Parliament, the media and the City in this process, and encouraged proper exchanges of information between them and Ofwat.

I believe the price setting process over the last 3 years has been productive and challenging. Ofwat has worked closely with the companies throughout on both policy and technical issues, for example, in the Director General's Working Groups.

I have issued consultation papers on *The Cost of Capital* (1991), *Assessing Capital Values* (1992), *The Cost of Quality* (1992), *Paying for Quality* (1993) and *Paying for Growth* (1993). Last November I published my conclusions in the light of the responses to my consultation papers, setting out the approach to the review in *Setting Price Limits for Water and Sewerage Services.*

Involvement of customers

Customers have been more involved than ever before in influencing decisions on prices and customer service. The Customer Service Committees (CSCs), and in particular their Chairmen, have advised me on customers' views and concerns from a position of knowledge. Their role has been, I believe, a valuable innovation in regulation. Their views are set out at the end of this document.

I also encouraged the companies to produce Market Plans in the spring of 1993, which would set out companies' proposals for meeting their customers' aspirations. I suggested that they should conduct such market research as they considered appropriate to support their plans.

Paying for quality

Good working relationships have been achieved with the Department of Environment and Welsh Office, as the chief environmental standard setters, and with the quality regulators, the Drinking Water Inspectorate (DWI) and the National Rivers Authority (NRA). As a result, mechanisms have been established for identifying and managing legally enforceable environmental obligations to be met by companies, analysing the costs and benefits of compliance and monitoring performance.

In *Paying for Quality*, I argued that improvements in water quality should proceed at an affordable rate. In their paper, *Water Charges: the Quality Framework* (October 1993), the Secretaries of State recognised this principle and set out their requirements for water quality. Since then they have further defined the obligations to be achieved, especially with respect to the requirements of the EC Urban Waste Water Treatment Directive (UWWTD).

The Secretaries of State subsequently provided guidance to the NRA on an additional programme of expenditure by sewerage companies designed further to improve water quality in a number of rivers in the period 1995-2000.

A fair and robust approach

The price limits announced today are the culmination of 3 years work by the companies, the quality regulators and Ofwat. This work, and the consultative nature of the process has resulted in what I believe has been a fair and robust approach.

Last March, following extensive preparations, the companies sent me their Strategic Business Plans (SBPs), which set out their detailed investment proposals and what, in their view, would constitute suitable price limits. These SBPs formed the basis for intensive review and analysis of data by Ofwat staff. Comparisons between the position of the different companies assisted in providing the basis for many of the judgements which I made. I was also able to draw on the comments of the independent Reporters appointed under the terms of the Licence.

I sent each company a draft determination in late May and they prepared written representations in response. I subsequently met the senior management of each company to clarify further their key concerns. In the light of these written representations and oral presentations, I made some modifications to my draft proposals in reaching my determinations.

The future

The work involved in the Periodic Review also entailed establishing a basis for monitoring the performance of the companies in delivering the required outputs within the new price limits. The outputs on which I shall focus are: companies' financial performance; their progress in implementing legislative requirements relating to drinking water quality and waste water treatment (where the standard setters and quality regulators will take the lead); and their performance in delivering services to their customers and in dealing with growth in demand for water and sewerage services.

The next Periodic Review will take place after either a 5 year or 10 year period. The regulatory framework allows price limits to be reviewed before then if specific circumstances, especially the imposition of new obligations, arise. I have, however, sought to set price limits which will provide stability between Periodic Reviews.

Diversification

I have also acted to ensure that prices charged to customers are protected from any harmful effect arising from diversification into new activities by the companies.

Conclusion

I believe that in making these determinations of price limits I have satisfactorily discharged my statutory duties. If, however, the companies dispute my determinations, they can require me to refer the matter to the Monopolies and Mergers Commission (MMC). They have 2 months (until 28 September) in which to decide whether to do this. The MMC then has 6 months, with one permitted extension of up to 6 months, to make a complete replacement determination in accordance with the same statutory principles as applied in relation to my determination.

I C R Byatt
28 July 1994

OVERVIEW

The Director has set price limits for each company for each of the 10 years from 1995-96 to 2004-05. The K factors, which limit the average increase in annual charges in relation to inflation, are set out in Table 1.

Taking account of the operating circumstances and investment demands in different regions, they will permit continuing improvements in environmental quality and customer service but are subject to consideration of what customers can afford to pay.

Companies will absorb a substantial part of the cost of meeting new legally enforceable EC obligations on water quality.

The pattern of price and infrastructure charge limits

K factors

The weighted average K factor for the 10 year period is 0.9. Because capital expenditure to meet environmental obligations for sewage treatment is concentrated in the first 5 years, the average K factor is higher in the 5 years up to 2000, 1.4, falling to 0.4 for the first 5 years of the next century.

Comparisons with the past

These price limits show a marked deceleration compared with those which have operated in the last 5 years (over 5% each year on average), with those originally set for the second half of the 1990s by the Secretaries of State in 1989 (around 4% in each year on average) and those implied in the companies' Market Plans (over 6% a year on average). Company specific comparisons are shown in Table 2.

Regional pattern

The regional pattern is dominated by the consequences of legally enforceable waste water obligations, especially the cost of implementing the requirements of the EC Urban Waste Water Treatment Directive (UWWTD). In some cases, prices will rise outside the range of 0-2% a year in real terms favoured by customers.

The K factors for companies with a long coastline in relation to the resident population (and therefore greater obligations under the UWWTD), such as Southern, are higher than those for inland companies such as Thames and Severn Trent. In the South West, where customers have experienced disproportionately large increases in the last 3 years, future increases have been contained by using scope within legal requirements to defer some environmental schemes.

The greater impact of legal obligations on the sewerage service is shown by the higher average K factor, over the 10 years to 2004-05, of 1.0 for the water and sewerage companies, compared with the average K factor of -0.4 for the water only companies.

Table 1 Price limits for 1995-96 to 2004-05

Company	Annual price limits 1995-96	1996-97 to 1999-00	2000-01 to 2004-05	average over 10 years
Water and sewerage companies				
Anglian	1.5	1.5	1.5	1.5
Dwr Cymru	0.5	0.5	0.5	0.5
North West	2.5	2.5	0.0	1.2
Northumbrian	2.5	2.5	2.0	2.2
Severn Trent	0.5	0.5	0.0	0.2
South West	1.5	1.0	0.0	0.5
Southern	4.0	4.0	3.0	3.5
Thames	0.5	0.5	0.5	0.5
Wessex	1.5	1.5	0.5	1.0
Yorkshire	2.5	2.5	0.0	1.2
WaSC average (weighted)	**1.5**	**1.5**	**0.6**	**1.0**
Water only companies				
Bournemouth & W Hampshire	-0.5	-0.5	-0.5	-0.5
Bristol	1.0	1.0	-3.0	-1.0
Cambridge	-2.0	-2.0	-2.0	-2.0
Chester	-1.0	-1.0	-1.5	-1.3
Cholderton	0.0	0.0	0.0	0.0
East Surrey	-1.0	-1.0	-1.5	-1.3
Essex & Suffolk	2.0	2.0	-1.5	0.2
Folkestone	-0.5	-0.5	-1.0	-0.8
Hartlepools	1.5	1.5	0.5	1.0
Mid Kent	1.0	1.0	-1.0	0.0
Mid Southern	-1.0	-1.0	-1.0	-1.0
North East	0.0	0.0	-0.5	-0.3
North Surrey	2.0	2.0	-1.5	0.2
Portsmouth	-1.5	-1.5	-1.5	-1.5
South East	-1.0	-1.0	-1.0	-1.0
South Staffs	-0.5	-0.5	-1.0	-0.8
Sutton	-1.5	-1.5	-1.5	-1.5
Tendring Hundred	-0.5	-0.5	-0.5	-0.5
Three Valleys	2.5	2.5	-1.0	0.7
Wrexham	-2.0	-2.0	-2.0	-2.0
York	0.0	0.0	0.0	0.0
WoC average (weighted)	**0.6**	**0.6**	**-1.3**	**-0.4**
Industry average (weighted)	**1.4**	**1.4**	**0.4**	**0.9**

Notes

1 Companies are permitted to increase charges each year, on average, by RPI plus (or minus) the limit shown in this table.

2 The price limits for 1995-96 take account of any unused K carried over from previous years. For companies with carry-over, the formal Adjustment Factor (K) set for that year will be lower than the effective price limit shown here.

3 Portsmouth increases its charges in July, rather than April. The 1995-96 figure shown here is the effective limit on the July charges increase.

Table 2 Comparison of price limits

Company	Average annual price limits 1995-96 to 1999-00		
	Previous limit set in 1989	Market Plan	Determination
Water and sewerage companies			
Anglian	5.5	5.9	1.5
Dwr Cymru	5.5	2.3	0.5
North West	5.0	8.1	2.5
Northumbrian	3.0	7.9	2.5
Severn Trent	2.0	6.4	0.5
South West	5.5	8.8	1.1
Southern	0.0	10.0	4.0
Thames	4.5	4.8	0.5
Wessex	4.5	6.7	1.5
Yorkshire	3.0	6.5	2.5
WaSC average (weighted)	**3.9**	**6.4**	**1.5**
Water only companies			
Bournemouth & W Hampshire	1.8	4.8	-0.5
Bristol	2.0	2.5	1.0
Cambridge	-1.6	3.0	-2.0
Chester	1.0	1.3	-1.0
Cholderton	6.0	-	0.0
East Surrey	2.0	1.0	-1.0
Essex & Suffolk	3.8	8.4	2.0
Folkestone	0.0	7.7	-0.5
Hartlepools	3.5	4.6	1.5
Mid Kent	2.5	9.4	1.0
Mid Southern	0.0	1.9	-1.0
North East	2.0	2.5	0.0
North Surrey	2.0	5.0	2.0
Portsmouth	2.0	2.0	-1.5
South East	0.0	1.7	-1.0
South Staffs	2.0	2.9	-0.5
Sutton	3.5	3.4	-1.5
Tendring Hundred	2.5	1.8	-0.5
Three Valleys	1.0	6.6	2.5
Wrexham	0.0	0.0	-2.0
York	3.0	5.9	0.0
WoC average (weighted)	**1.9**	**4.6**	**0.6**
Industry average (weighted)	**3.7**	**6.2**	**1.4**

Notes

1 The previous limits are those set in 1989 by the Secretaries of State for the Environment and for Wales, or by the Director General of Water Services following mergers between companies.

2 Cholderton did not prepare a Market Plan.

Infrastructure charge limits

Companies are permitted to levy *infrastructure charges (as well as the direct costs of* connection) when properties are connected to water and sewerage systems for the first time. Where these charges are for domestic supply they are subject to a limit. Current limits vary from under £200 to over £1,000 for water and sewerage services separately. In 1989 these charges were set to enable companies to recover all the costs associated with servicing additional customers including the provision of additional resources and treatment works.

The Director judges that such charges should be restricted to the costs of developing the local network and that they should be limited to £200 for each service in 1995-96. Subsequently they will rise only in line with inflation.

Factors affecting price limits

In setting K factors, the Director has distinguished between normal utility operations, that is delivering water and sewerage services to customers, while maintaining or enhancing existing standards of service, and the consequences of legal obligations to improve water and environmental quality.

Price increases over the next 10 years will be limited to what is necessary to meet statutory environmental obligations. Accordingly, companies will need:

- to provide existing standards of service (normal utility operations) at prices which are below today's in real terms;
- generally to fund improvements in standards of service through greater efficiency rather than higher prices. Price limits will, however, allow for expenditure of £590 million over the decade on measures designed to reduce flooding from sewers.

The companies are obliged to comply with environmental legislation; these obligations have been, and will continue to be, the main factors pushing up customers' bills.

Under the price limits set by the Director, much of the extra cost in meeting legally enforceable standards for water quality will be met by the companies. Bills will rise by less than would otherwise have happened. The companies will be expected to carry out new obligations economically at a modest return on new investment. They will be expected to absorb a substantial part of the cost of new obligations both by increasing operating efficiency and by managing with a lower return on their existing capital base.

The cost of quality

As shown in Table 3, the cost of improving water quality would, in the absence of other factors, have increased the average household bill, currently £201 a year, by £44 above

Table 3 Factors affecting household bills (England and Wales average) 1994-95 to 2004-05

1994-95 prices

	Change in average household bill (£) 1994-95 to 2004-05		
	Water	Sewerage	Total
Q Quality improvements	+13	+31 *	+44
{ Reduction in base operating costs	-7	-5	-12
-X { Reduction in return on existing assets	-6	-6	-12
{ Growth, levels of service and capital maintenance	+1	+2	+3
K Net effect on bills	+1	+22	+23

* of which UWWTD £22

Notes

1 The table shows the cumulative change from 1994-95 to 2004-05 in household bills (England and Wales average).

2 The figures in the table are illustrative; actual increases in bills for water and sewerage will reflect companies' decisions on how the overall price limit is allocated across different tariffs, subject to the requirements in the Licence to avoid undue discrimination or preference between classes of customer.

3 On average, water bills will rise slightly more than they would otherwise have done as a result of rebalancing of tariffs to equalise returns on assets, and sewerage charges less than otherwise; the total water and sewerage bill is unaffected.

inflation by 2004-05. This would be made up of an increase of £13 a year for drinking water quality and £31 a year for sewerage services.

These figures allow for increases in efficiency in carrying out these programmes. The unit costs of different companies have been compared and what has been allowed for in price limits represents the costs for lower cost companies. It has been assumed that low cost solutions will be adopted. Account has been taken of the responsibilities of the planning authorities in connection with the requirements of EC Directives.

The Director has assumed that companies will be able to implement these programmes at a cost of capital of between 5 and 6% in real terms, ie after taking account of inflation and after business taxes on new investment.

Greater operating efficiency

The Director has concluded that companies have scope to reduce the operating cost of providing existing services by some 14% in real terms by 2004-05. The amount varies, between companies, ranging from 7% to 20%. For the industry as a whole, this would permit a reduction in the annual average household bill of £12 in real terms by 2004-05.

Lower return on capital

The Director has also concluded that the companies could finance their functions at a lower rate of return on capital than they are currently earning. He considers that any retrospective reduction would be harmful to incentives to save costs in the future. He does, however, see scope for a reduction in prices as a result of a convergence of the return on existing capital towards the 5-6% real return on new capital. This reflects the lower risk which companies now face, compared with the situation in 1989. It accounts for a reduction in the annual average household bill in real terms of £12 by 2004-05.

Business customers will also benefit from these reductions in operating costs and return on capital.

Growth and levels of service

The cost of developing the local network to provide for water and sewerage services for new properties will be met by infrastructure charges. The cost of providing for growth in supply generally will not involve a substantial increase in charges. Demand forecasts show modest increases and installation of meters in areas of shortage will restrain the need for expenditure.

The financing of expenditure of £590 million in 1993-94 prices to reduce the risk of flooding from sewers will add a small amount to sewerage charges. As a result over 10,000 properties will be removed from the risk of this unpleasant event.

Capital maintenance

Companies should sustain the serviceability of their assets, and should have sufficient finance for this purpose. Broadly speaking, price limits allow for companies to continue, in real terms, the levels of expenditure in planned maintenance and renewals of assets of recent years. The greater knowledge of their assets acquired in the preparation of the Strategic Business Plans (SBPs) will enable them to make such expenditure increasingly more effective.

The water and sewerage services

(a) Drinking water

Increases in efficiency and a lower return on capital will offset much of the additional costs of higher drinking water quality, although some water companies will have to spend heavily to meet the stringent EC standard for the removal of pesticides.

(b) Sewage treatment

Waste water treatment and disposal presents a very different picture. Although it seems that the UWWTD can be implemented more cheaply and with a much lower impact on bills than seemed likely a year ago, it will still involve investment of around £6 billion over the 10 years of the price limits, together with continued additional operating costs. At the national level it will push bills up by some £22 above inflation by 2004-05.

Much of the investment arising from the UWWTD will affect effluent discharges to coastal and estuarial waters. While it is possible for inland companies to absorb much of the higher costs, this will not be possible for several companies with a high coastal population. Sewerage charges have already risen sharply in the South West. In the next 10 years, the biggest increases will be for Southern, followed by Northumbrian. Sewerage charges will also rise in Yorkshire, the North West and to a lesser extent elsewhere.

On 6 July the Secretaries of State announced expenditure by sewerage companies of £522 million to improve the quality of rivers in the period 1995-2000. Working within this total amount of money, the National Rivers Authority (NRA) will be able, in consultation with sewerage companies, to develop a targeted programme of improvements of discharges from sewage works in the way it judges most effective to raise the quality of selected stretches of river. These improvements will be in addition to those arising from the UWWTD programme. There will be increases amounting to about £1.50 above inflation on domestic bills by 2000 to finance this programme. This will not, however, affect bills in the South West and Northumbria.

The expenditure allowed for in these price limits to meet legally enforceable quality obligations is substantially greater than that allowed for quality enhancements in the decade following the setting of price limits in 1989.

Incentives for the companies

The price limits which the Director has determined mean that companies will have to work harder to earn profits than in the first 5 years of privatisation.

The incentive for the companies is that by becoming more efficient across the whole range of their activities, they can continue to earn profits which allow them to achieve reasonable returns for their shareholders.

As in a competitive industry, efficient water companies will be held in high regard by both their shareholders and their customers. The price limits determined by the Director should put inefficient companies under pressure from both parties.

Customers' bills

The K factor limits the average increase in a company's charges to its customers. Increases in the bills for individual customers, and even for large classes of customers, such as household customers, will often differ from the K factor.

The average increase is determined by reference to a "basket" of tariffs which takes account of the balance between the numbers of customers taking measured and unmeasured supplies and the different charges, for example to household and business customers and for water and sewerage services[1]. Provided that there is no undue discrimination against, or undue preference in favour of, particular classes of customers, the precise way in which the increases are applied is a matter for the companies rather than the regulator.

Household bills

Table 4 shows that the average annual household bill may rise by around £17 above inflation by 2000. This compares with the expectation of an increase of £60 in the companies' Market Plans or the possible increase of £36 to £54 which could have resulted from the increases in quality being discussed a year ago.

There should be some regional convergence in average household bills over the next 5 years. The average annual household bill in Thames is likely to rise in real terms, while that for household customers in Anglian is likely to fall because of a switch to metering, despite a positive K factor. Lower bills such as Southern's will rise significantly as a result of the implementation of the UWWTD, while South West's will change much less.

[1]The tariff basket calculation is set out in Condition B of the Licence under which each company operates. The weighted average charges increase calculated under Condition B can differ from the average change in charges and in bills, particularly if a significant number of customers with unmeasured water supplies become metered during a year. This applies particularly to Anglian Water.

Table 4 Average household bills

1994-95 prices

Company	Average annual household bills (£) 1994-95 Water	1994-95 Sewerage	1999-00 Water	1999-00 Sewerage	Change Water	Change Sewerage
Water and sewerage companies						
Anglian	122	138	107	146	-15	8
Dwr Cymru	128	127	119	141	-9	14
North West	86	97	88	126	2	29
Northumbrian	88	99	106	109	18	10
Severn Trent	81	99	86	105	5	6
South West	118	184	120	192	2	8
Southern	85	116	96	146	11	30
Thames	83	86	80	102	-3	16
Wessex	103	120	116	123	13	3
Yorkshire	95	96	105	115	10	19
WaSC average (weighted)	**94**	**106**	**95**	**121**	**1**	**15**
Water only companies						
Bournemouth & W Hampshire	90		88		-2	
Bristol	91		95		4	
Cambridge	100		91		-9	
Chester	107		100		-7	
Cholderton	121		121		0	
East Surrey	145		141		-4	
Essex & Suffolk	100		110		10	
Folkestone	107		102		-5	
Hartlepools	79		84		5	
Mid Kent	119		125		6	
Mid Southern	109		105		-4	
North East	89		90		1	
North Surrey	96		107		11	
Portsmouth	67		66		-1	
South East	152		145		-7	
South Staffs	73		73		0	
Sutton	112		105		-7	
Tendring Hundred	142		135		-7	
Three Valleys	92		104		12	
Wrexham	129		118		-11	
York	82		81		-1	
WoC average (weighted)	**98**		**101**		**3**	
Industry average (weighted)	**95**	**106**	**97**	**121**	**2**	**15**

Notes

1 The bills shown in this table are an average of those paid by households on a volumetric (measured) and a rateable value (unmeasured) basis.

2 The increases to 1999-00 take account of the overall price limit for the company and assumptions about changes in the numbers of customers and volumes consumed. They are illustrative only; it is for companies to determine how the overall price limit is allocated across different tariffs, subject to the requirements in the Licence to avoid undue discrimination or preference between classes of customer.

3 The bills shown in this table assume that any rebalancing between water and sewerage services to equalise current cost rates of return is completed by 1999-00.

Bills of customers of more than half of the water only companies will fall in real terms, notably in the South and East, where they are currently among the highest.

Business customers

Subject to any rebalancing of tariffs, changes in bills paid by business customers should largely reflect changes in household bills. As their supplies are usually measured, they will also vary according to use.

Future changes to price limits

Price limits have been set for 10 years ahead, but they can be reviewed in 5 years' time if either the companies or the Director wish to do so. If new legal obligations are imposed on the companies, for example in respect of the quality of drinking water or waste water, prices to customers may need to be further increased, as happened in the South West following the Secretary of State's 1990 decision to accelerate implementation of the Bathing Waters programme. For Anglian, North West, Northumbrian and Yorkshire, K factors may also need to be raised at an interim determination should construction prices rise markedly. The basis of such interim determinations has been simplified by the amendments now agreed by companies to Condition B of their Licences.

The Director welcomes the commitment of the Government to ensure that new obligations are implemented only after assessments of the costs which would be imposed on customers.

1. APPROACH TO PRICE SETTING

In setting price limits, the Director must act in the way he considers best calculated to secure that the functions of a water undertaker and a sewerage undertaker are properly carried out as respects every area of England and Wales and that companies can finance the proper carrying out of their functions, in particular by securing reasonable returns on their capital. Subject to these considerations, the Director must act in the way he considers is best calculated to protect the interests of customers, promote economy and efficiency in the way companies carry out their functions and facilitate competition between suppliers and potential suppliers.

The Director explained in *Setting Price Limits for Water and Sewerage Services* (November 1993) how he intended to approach the first Periodic Review of price limits of the 21 water companies and 10 water and sewerage companies, in the light of his duties. This document sets out the results, and describes how the framework has been applied in practice.

Framework for decisions

In order to set price limits in the light of his legal duties, the Director must make a series of judgements.

First, the Director needs to take a view on what is involved in the proper carrying out of the functions of the company. In forming that view, the Director has taken into account the views of customers, and in particular the extent of customer demand for changes in the discretionary elements of service delivery. In relation to the legal requirements on quality, the steps to be taken are set out in the document published by the Secretaries of State, *Water Charges: the Quality Framework*, and subsequent guidelines developed by the National Rivers Authority (NRA) and confirmation of requirements by the Drinking Water Inspectorate (DWI). The Director has taken a view on the costs associated with meeting these quality requirements and the consequences of these costs for the price limits.

Second, the Director needs to secure that the company can properly finance the carrying out of its functions, including securing a reasonable return on its capital. That involves taking a view not only on the relevant return on capital and the appropriate capital base, but also on the risks, especially the financial risks, facing the companies.

Third, the Director needs to ensure that the interests of customers are protected. The views of customers, including the views expressed through Chairmen of Customer Service Committees (CSCs), on overall affordability of water and sewerage charges are clearly important in this connection, especially in relation to elements in forward programmes not directly arising out of legal and quality obligations. A description of the process follows, and the comments of CSC Chairmen are set out in a statement published at the end of this document.

Fourth, the Director must have regard to his statutory duties to promote economy and efficiency on the part of companies. In setting price limits he needs to ensure that companies retain incentives to improve efficiency. In particular, in considering how and over what period savings as a result of greater efficiency should be transferred to customers through lower price limits, he needs to take account of the fact that too rapid a transfer would blunt incentives to make future economies. Price limits should also incorporate targets which companies could be expected to meet in the future while continuing to be able to deliver existing levels of service to customers.

Components of new price limits

(a) Water and sewerage

In general, sewerage charges will increase much more rapidly than water charges (except for inland companies), reflecting the impact of compliance with the EC Urban Waste Water Treatment Directive (UWWTD).

Although there are no separate K factors for the supply of drinking water and the disposal of waste water, the Director considers he should give a broad indication of the likely differential effect of the Periodic Review on the amounts customers pay for water and sewerage services.

Customers should be aware of the link between standards and bills. Some buy water and sewerage services from different companies. There should be no cross-subsidy between the two services.

Table 5 shows the cumulative K factors for the next 10 years disaggregated into separate water and sewerage elements. This breakdown is illustrative; to set separate K factors formally would require a Licence amendment. The results reflect the impact both of meeting new legal obligations to improve quality, net of reductions in normal utility costs, and any rebalancing of water and sewerage tariffs to avoid cross-subsidy[2].

(b) Utility operations and quality

The K factor for a company can be thought of as comprising two elements:

- -X, comparable to the X factor for other utilities, for the normal utility operations covering:

    base service levels: the maintenance of existing levels of service (including the return on existing assets);

[2]Rebalancing aims to achieve broadly the same return on current cost assets in the two services. To achieve this, water bills will, on average, need to increase slightly faster, and sewerage bills slightly slower, than would otherwise be the case.

Table 5 Increases in water and sewerage charges, 1994-95 to 2004-05

Company	10 year cumulative K, and balance between water and sewerage K	Water	Sewerage
Water and sewerage companies			
Anglian	16	4	25
Dwr Cymru	5	-12	24
North West	13	-2	26
Northumbrian	25	22	26
Severn Trent	3	2	3
South West	6	4	7
Southern	41	19	51
Thames	5	-11	16
Wessex	10	12	10
Yorkshire	13	6	20
WaSC average (weighted)	**11**	**0**	**20**

Notes

1 These figures are indicative of the split between services in the price limits that have been set, reflecting both changes in expenditure and rebalancing of tariffs between water and sewerage. It is for companies to determine how the overall price limit is allocated across different tariffs, subject to the requirements in the Licence to avoid undue discrimination or preference between classes of customers.

2 Rebalancing of tariffs is material for 4 companies: for Northumbrian and Wessex water charges will rise slightly more than they would otherwise have done; for Thames and Yorkshire sewerage charges will rise slightly more that they would otherwise have done; the total bill is unaffected.

- enhanced service levels: the improvement in standards of service not driven by legal obligations;

- growth: programmes for system expansion, leakage or demand management measures to meet any shortfall between demand and existing capacity; and

- other factors, such as changes in the charging base of the company.

- +Q, which reflects statutory improvements in drinking water and environmental quality standards.

The reduction in prices in real terms for water and sewerage services (-X), as a result for example of increased efficiency, is offset by increases arising from the significant improvements in quality (+Q) still required.

The examination of Strategic Business Plans (SBPs) has enabled the Director to make judgements concerning the resources required to deliver these outputs. In order to give some understanding of the factors affecting individual company price limits, Table 6 shows the illustrative division of the overall K factor between the -X and +Q elements.

Some X factors are small; in one case it is positive. For companies such as Three Valleys and Hartlepools, this reflects a smaller measured charging base, following the loss of some large business customers. For Anglian, average bills will fall even though K is positive; the X factor reflects the effect on the tariff basket of the company's programme for metering households.

Within each broad purpose category, 3 main elements of costs have been considered:

- operating expenditure;
- capital maintenance; and
- return on capital.

Taken together these 3 elements comprise the total revenue to be recovered from customers.

Later sections of this document set out the Director's conclusions on the different elements of costs and their financing.

Comparisons between companies

The Director's judgements have been informed by comparisons between the companies, with respect to their costs and their performance.

Table 6 Factors affecting price limits, 1994-95 to 2004-05

Company	10 year cumulative K, and balance between utility operations and quality		
	K	X	Q
Water and sewerage companies			
Anglian	16	-1	17
Dwr Cymru	5	-29	34
North West	13	-12	25
Northumbrian	25	-18	43
Severn Trent	3	-11	14
South West	6	-16	22
Southern	41	-1	42
Thames	5	-10	15
Wessex	10	-10	20
Yorkshire	13	-15	28
WaSC average (weighted)	**11**	**-10**	**21**
Water only companies			
Bournemouth & W Hampshire	-5	-13	8
Bristol	-10	-13	3
Cambridge	-18	-21	3
Chester	-12	-12	0
East Surrey	-12	-15	3
Essex & Suffolk	2	-14	17
Folkestone	-7	-12	5
Hartlepools	10	6	4
Mid Kent	-0	-10	10
Mid Southern	-10	-22	13
North East	-2	-6	3
North Surrey	2	-13	16
Portsmouth	-14	-14	0
South East	-10	-23	14
South Staffs	-7	-11	3
Sutton	-14	-18	4
Tendring Hundred	-5	-13	9
Three Valleys	8	-1	9
Wrexham	-18	-25	7
York	0	-10	10
WoC average (weighted)	**-3**	**-12**	**8**
Industry average (weighted)	**9**	**-11**	**20**

Notes

1 These figures are indicative of the split between utility operations and quality in the price limits that have been set, and are illustrative only.

2 The X factor reflects changes in the return on base assets, expenditure on growth, enhanced levels of service and features of a company's charging base as well as reductions in operating costs through greater efficiency.

The Director has assessed the scope for improved efficiency by reference to the individual operating circumstances of each company and also to comparisons between the costs incurred by different companies for similar activities. As he pointed out in the statement printed in the Prospectus in 1989, "comparisons between appointed companies can help to promote efficiency and achieve low prices for consumers". Examination of the costs incurred by low cost or otherwise efficient companies has helped the Director to form a view on the costs that should be allowed for in determining the price limits, and to propose price limits that are fair and consistent across all companies. In this connection the Director has taken into account information supplied to Ofwat earlier, as well as information in the SBPs.

Good comparisons depend on systematic information which is collected consistently across companies. Ofwat has collected regular information annually from companies (the July Returns). For the Periodic Review, they were asked to submit SBPs which contained a wealth of standardised information[3]. In addition, last year, special information was collected on the cost of capital projects and on the operating costs of the sewerage service.

Role of the Reporters

In assessing the SBPs, the Director has benefited from the work of the independent Reporters, appointed under the Licence, who have a duty of care to him. They ensured that all material assumptions were disclosed by the companies and, where necessary, challenged. Their role was not to pass judgement on the companies' plans. They were asked to pay particular attention to the allocation of costs between broad output categories - base service provision, enhanced service levels, supply/demand balance and quality enhancements - and the assessment of the additional cost of new quality obligations.

Serviceability

Companies need to maintain their assets in order to preserve existing levels of service. They have been carrying out valuable work collecting information about their assets and using it to manage them more efficiently. Examples include drainage area studies, network analysis, condition surveys, risk analysis and detailed asset registers. These initiatives will allow companies to build up over time much more knowledge about the behaviour of their assets and to improve their ability to maintain and operate them more efficiently. They will be able to target their maintenance efforts better, and achieve greater value for money.

In setting price limits, the Director has looked at the levels of service achieved by the companies in the past in relation to the expenditure on maintaining assets. There is no evidence of widespread decline in service standards; indeed in many areas there have been improvements. The Director has concluded that, broadly, expenditure should carry

[3]The smallest company, Cholderton and District Water Company Ltd, which serves just over 500 properties, was not required to submit an SBP. Its price limit has been set at a level comparable to similar companies. An assessment of its financial prospects was prepared by a consultant reporting to the Director.

on at existing levels. Expenditure by companies to meet legal obligations also often brings a wider benefit to customers in terms of levels of service.

Financing functions

The statutory duties placed on the Director mean that water companies are subject to less risk than many other sectors of the economy. The Director considers that returns can fall from current levels without prejudicing companies' ability to finance their functions. But risks are not absent. Many companies have large capital expenditure programmes, some have significant revenue risks because of their dependence on a small number of large business customers, and companies are also subject to a varying degree of risk from movement in construction prices. Sensitivity analyses have therefore been carried out to estimate the impact which these risks may have on profits. This has indicated the scale of headroom in profits needed both to reflect the potential impact of adverse business risk which companies must bear until a further Periodic Review, and to provide a continuing return to companies which take a higher risk. But where risk is higher, because the scope for adjustment of prices between Periodic Reviews has been reduced, companies will have more management freedom to plan their activities and reduce costs, so that in the longer term both companies and customers benefit.

At present, the water and sewerage companies are not generally liable to mainstream corporation tax, although many of the water only companies are. During the next 10 years, this situation will change. The scale of this is difficult to predict and, indeed, will depend on companies' policies for the financing of their investment programmes. The price limits have made allowance for additional tax payments.

Incentives for economy and efficiency

Once price limits are set, companies have considerable flexibility on how they carry out their functions. In particular, they can make their own decisions on the rate at which they improve discretionary elements of quality and service. The price limits set the constraints; companies plan their operations within them. The companies are encouraged to consult their customers in making these decisions. The performance of companies against quality obligations will be monitored by the NRA and the DWI. Ofwat will expect companies to report on their provision of service to customers. The Director will take action if service levels fall below an acceptable level.

The price limit also provides incentives to the companies to be economical and efficient. When they reduce their operating costs below the level allowed for in the determination, maintain the service capability of their assets more efficiently or are able to raise money in the capital markets more cheaply than assumed by the regulator, they will be rewarded by the additional profits that will accrue. At subsequent Periodic Reviews, the regulator can ensure that these benefits are, in time, transferred to customers through lower price limits.

2. THE DIRECTOR'S PROJECTIONS

Price limits and infrastructure charge limits have been set by the Director for the 10 years from 1995-96 to 2004-05. The Director does not determine what companies are allowed to spend. He does not expect the companies to spend in any predetermined way; their performance will be measured by their achievements on water quality, compliance with discharge standards and customer service rather than by how much they spend.

In the light of these limits, companies may re-examine the level and make up of their expenditure. They may need to adjust their views as circumstances unfold in the next 10 years. They have incentives to do this in the way they consider to be the most efficient. The Director has asked companies to publish their plans for meeting customers' expectations of improvements in quality and service standards as a result of their new price limits.

When coming to his judgements on price limits, the Director reached broad conclusions on the expenditure to be allowed for in the price limits for each company, using the material in the SBPs as well as other material. Ofwat's analysis has focused on the 4 main purpose headings for future expenditure. The Director believes that it is useful for him to set out the costs allowed for in price limits.

Price limits have been determined on a basis which, in the Director's view, will generate sufficient revenue to finance these costs. He has used financial models for this purpose. However, these projections are not forecasts; companies will need to develop their own plans, reflecting management judgements, for delivering outputs within the price limits. Financial performance will also be affected by external circumstances. The Director does not therefore think it is right to publish the financial projections for individual companies.

Base service provision

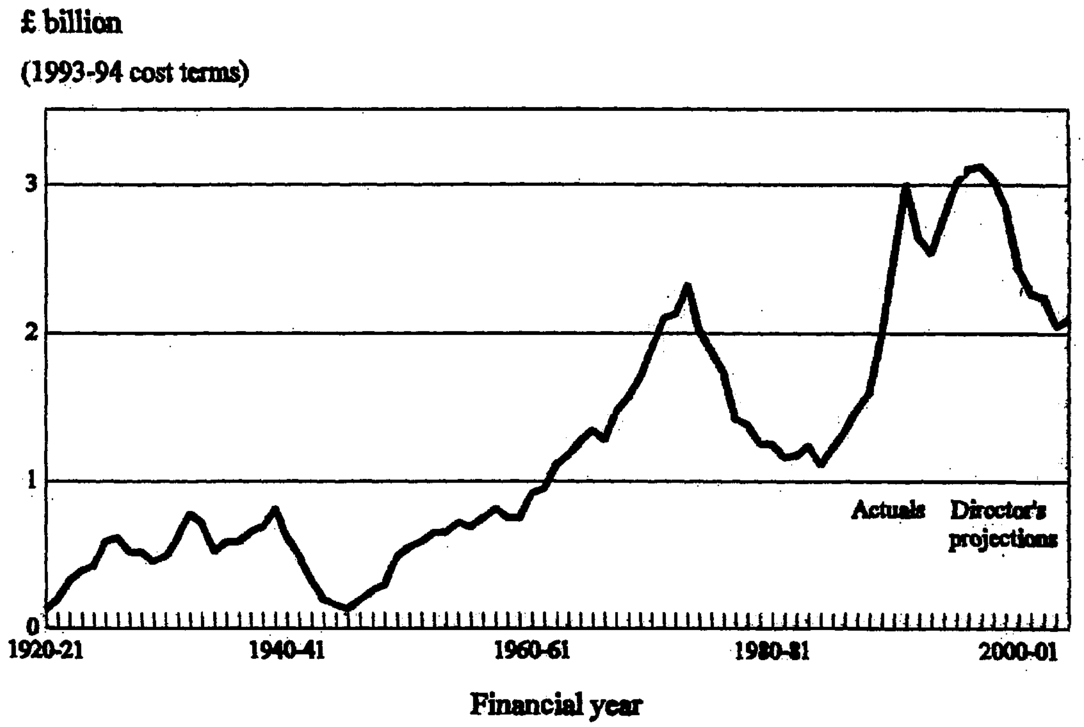
The Director expects companies generally to be able to deliver existing service levels at costs which are reducing in real terms. He believes that there is particular scope for cost savings in the next 5 years. The scope is greater for less efficient companies, if they are to become normally efficient. The basis of the Director's assessment of the scope for savings through greater efficiency is set out in Section 3.

Price limits reflect the scope for a well managed utility to reduce costs; the price limit system gives companies incentives to do even better. This will set new standards for efficiency at future price reviews, from which all customers will benefit. Recent announcements by several companies have shown that they recognise the importance of reducing costs.

Investment: the past and the future

As Figure 1 shows, during the 1990s the water industry embarked on an unprecedented capital expenditure programme. When the Secretaries of State set price limits for the newly created water and sewerage companies in 1989, they did so on the assumption that

Figure 1 Capital expenditure



Notes

1 The projected expenditure from 1995-96 is that allowed for in determining the price limits.

2 Figures are at 1993-94 cost terms. Actual expenditure in previous years has been repriced by RPI; future projections include an allowance for movements in capital expenditure prices relative to RPI.

capital expenditure during the 1990s would be £22 billion in 1987-88 prices (equivalent to £30 billion in 1993-94 prices). Since then, new obligations have been imposed on the companies. In 1990, the then Secretary of State for the Environment announced an acceleration of the implementation of the EC Bathing Waters programme, including anticipation of certain aspects of the UWWTD, and the cessation of dumping of sewage sludge to sea by 1998. The UK Government and other member states subsequently agreed to the implementation of the UWWTD.

The large increase in customers' bills which has taken place since privatisation - 5% a year above the rate of inflation - resulted mainly from the size of the investment programme and the consequent increase in operating costs.

Public reactions to the price increases taking place, to the companies' Market Plans, and to the Paying for Quality debate showed that many customers, and the CSCs, were unhappy at the prospect of continued increases in prices substantially above the rate of inflation.

The Director told the water companies that, in the period when legally enforceable quality obligations were pushing up bills so rapidly, improvements in discretionary levels of service should, so far as this was possible, come from greater efficiency, or as a by-product of investment in water quality, rather than from higher bills. He also argued that increases in capacity to meet any imbalance between supply and demand should be restrained by metering, in order to reduce the increase in bills.

In preparing *The Cost of Quality* and *Paying for Quality*, Ofwat worked with the Department of the Environment and the Welsh Office, the quality regulators and the water companies to identify the increases in water bills that might occur under a range of assumptions about future quality standards. Registering the concern of customers, the Director urged the Secretaries of State to take greater account of customers' bills in deciding on environmental obligations.

In their response, *Water Charges: the Quality Framework*, the Secretaries of State acknowledged that concern. They pointed out that "society's resources are not unlimited and that priorities must be taken into account in deciding how they should be used ..... it is not possible for the improvement of the water environment to have an absolute priority. Improvement must also take place at a rate which those who have to pay will consider bearable".

The Secretaries of State have subsequently looked closely at the implementation of the UWWTD in order to avoid unnecessary costs. Last summer it seemed likely that this Directive could involve additional capital expenditure of around £10 billion at 1993-94 prices. As a result of decisions concerning requirements at inland sewage treatment works and the requirements of sewerage systems, the definition of sensitive and less sensitive waters and further scrutiny of costs, the total capital expenditure cost of the UWWTD in England and Wales is now likely to be around £6 billion, plus associated running costs. Ministers have, however, also agreed a programme of further improvements in river quality which will add over £500 million to expenditure by sewerage companies in the years 1995-2000.

These decisions on water quality, especially in relation to waste water treatment, and the Director's expectation that improvements in discretionary levels of service should (with the exception mainly of flooding from sewers) be financed from efficiency savings, have made it possible to envisage an investment programme in the next 10 years of around £24 billion. While, as Figure 1 shows, investment will remain high in the second half of the 1990s, it could revert to more normal levels in the early years of the next century.

Operating Expenditure

The pressure for higher quality has been one of the factors pushing up the operating expenditure of the water industry. Figure 2 shows the substantial rise which has taken place since privatisation.

High investment and higher operating expenditure have led to a significant improvement in water quality. This is demonstrated in recent reports by the DWI and the NRA. The companies are to be congratulated on the improvements which they have achieved. They can now turn even more intensively to economy in the use of resources and to greater efficiency in achieving objectives.

On the basis of studies carried out by Ofwat, the Director considers that there is considerable scope for greater efficiency in delivering improvements in quality standards in relation to both capital and operating expenditure. Also, although total profits must be sufficient to finance high levels of investment, the return on new investment can, in the Director's view, be lower than was thought necessary in the very different circumstances that existed in 1989.

Expenditure projections

Table 7 shows the expenditure allowed for by the Director in setting price limits by purpose categories. It shows that:

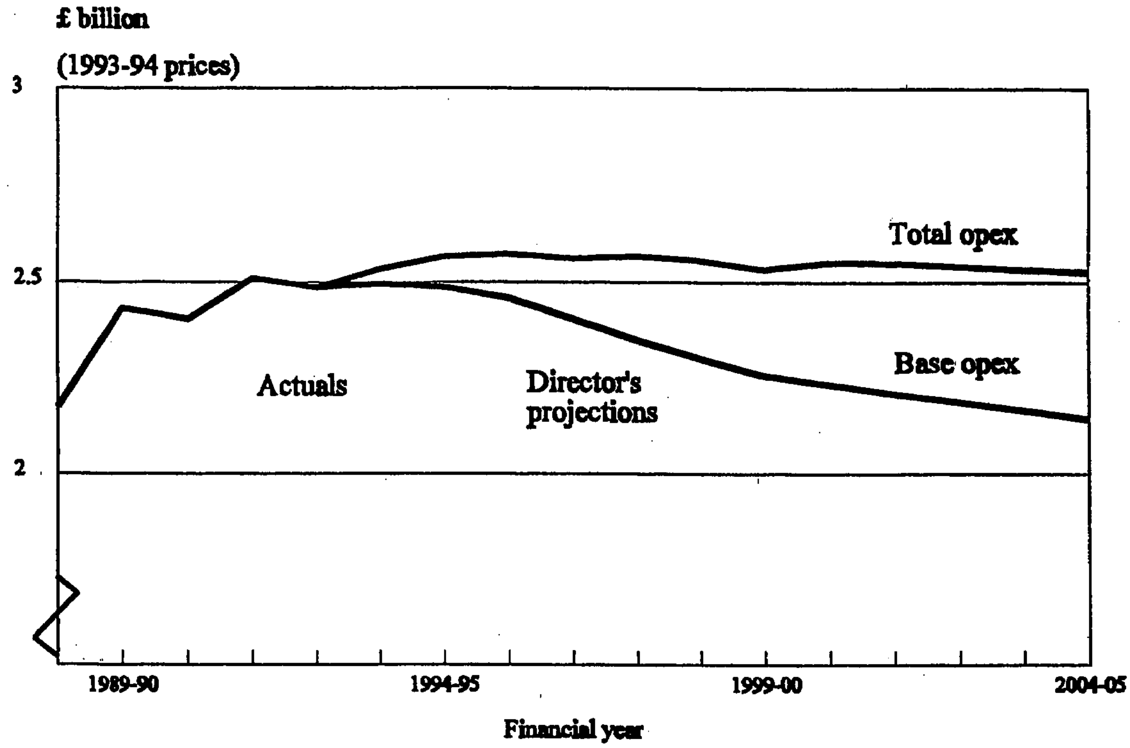
- while greater efficiency should reduce the operating costs of providing existing levels of service, operating costs overall may not fall when allowance is made for the cost of achieving new obligations;

- levels of expenditure allowed for the maintenance of assets, both overground and underground, are broadly stable;

- the forward capital expenditure programme allowed for the next 10 years is £24 billion: £11 billion of this is for quality improvements, another £12 billion for maintenance of the serviceability of assets and £1 billion for enhanced levels of customer service and to maintain the balance of supply and demand; £14 billion of this relates to the 5 years from 1995 to 2000;

- expenditure allowed for other purposes is relatively low, particularly when account is taken of the income which may be received from grants and customer contributions including infrastructure charges.

Figure 2 Operating expenditure



Notes

1 The projected expenditure from 1995-96 is that allowed for in determining the price limits.

2 Base operating expenditure reflects the costs of delivering 1992-93 service levels; total operating expenditure includes the operating cost consequences of enhancements to levels of service, dealing with supply/demand imbalances and achieving legal requirements on quality.

Table 7 Expenditure allowed for in determinations

£ billion 1993-94 prices

Industry totals	Average annual expenditure 1992-93	1995-96 to 1999-00	2000-01 to 2004-05
Base operating expenditure	2.5	2.4	2.2
Capital expenditure on capital maintenance			
- Underground	0.4	0.4	0.4
- Overground	0.8	0.8	0.8
Expenditure on enhanced quality (legal requirements for drinking water and waste water)			
- Capital expenditure	1.1	1.5	0.7
- Additional operating expenditure	-	0.2	0.3
Expenditure on enhanced levels of service			
- Capital expenditure	0.4	0.1	0.1
- Additional operating expenditure	-	*	*
Expenditure on improving supply/demand balance			
- Capital expenditure	0.4	0.2	0.2
- Customer contributions, inc infrastructure charges	-0.2	-0.1	-0.1
- Additional operating expenditure	-	*	*
Gross capital expenditure less grants and contributions - total	2.9	2.8	2.0
Operating expenditure - total	2.5	2.6	2.5

Notes

1. * less than £0.1 billion.

2 Figures are at 1993-94 prices and do not include any allowance for possible movements in capital expenditure prices relative to RPI.

3 Figures show expenditure allowed for by the Director in making his determinations. It is for companies to determine how objectives are achieved, and the actual level and balance of expenditure required.

Capital expenditure for individual companies allowed for in the final determinations (including expenditure on capital maintenance, but net of expected grants and contributions) is shown in Table 8.

Revenue and profitability projections

Table 9 shows, at an industry level, a summary of the financial projections underlying the Director's determination of price limits. It shows that:

- total turnover is projected to increase broadly in line with the average K factor;

- total operating expenditure is projected as broadly stable;

- accounting charges for capital maintenance in respect of underground and surface assets are projected to increase, reflecting additional current cost depreciation on net new investment; and

- current cost operating profits, which reflect a lower rate of return on a growing capital base, are projected to increase over the period.

In 1992-93 companies earned profits which, on the basis of the capital value assessed by the Director, provide a real return of some 13% (calculated as current cost operating profit, less corporation tax, as a percentage of total capital value). Over the 10 years of the new price limits, returns could fall to about half this rate. Companies overall will continue to borrow to finance at least part of the net new investment, and for many companies gearing levels will rise. But the extent to which companies will need to borrow will depend on their success in controlling operating and capital expenditure and on company decisions about the retention or distribution of profits. Where companies are able to secure additional efficiency savings over and above those reflected in price limits, they will be able to increase dividends to shareholders in real terms.

Table 8 Capital expenditure by company

£ million 1993-94 prices

Company	Average annual capital expenditure 1995-96 to 1999-00	2000-01 to 2004-05
Water and sewerage companies		
Anglian	280	200
Dwr Cymru	190	150
North West	460	290
Northumbrian	140	110
Severn Trent	380	240
South West	100	80
Southern	240	160
Thames	420	320
Wessex	100	70
Yorkshire	300	200
WaSC total	**2,610**	**1,820**
Water only companies		
Bournemouth & W Hampshire	7	4
Bristol	14	11
Cambridge	2	2
Chester	1	1
East Surrey	6	5
Essex & Suffolk	37	21
Folkestone	3	2
Hartlepools	1	1
Mid Kent	11	10
Mid Southern	15	12
North East	14	16
North Surrey	10	5
Portsmouth	7	5
South East	21	19
South Staffs	13	7
Sutton	3	2
Tendring Hundred	3	3
Three Valleys	34	31
Wrexham	2	2
York	2	1
WoC total	**208**	**159**
Industry total	**2,818**	**1,979**

Notes

1 Totals may not add due to rounding.

2 Figures are at 1993-94 prices and do not include any allowance for possible movements in capital expenditure prices relative to RPI.

3 Figures show expenditure allowed for by the Director in making his determinations. It is for companies to determine how objectives are achieved, and the actual level and balance of expenditure required.

Table 9 Financial projections

£ billion 1993-94 cost terms

Current cost profit and loss account	1992-93	1999-00	2004-05
Turnover	5.2	6.0	6.2
Operating expenditure	2.5	2.5	2.5
Capital maintenance charges [2]	1.2	1.5	1.5
Current cost operating profit [3]	1.6	2.0	2.2

Notes

1 These projections are illustrative only. They reflect operating expenditure and capital maintenance charges allowed for by the Director in making his determinations. It is for companies to determine how objectives are achieved and the balance of expenditure required.

2 Capital maintenance charges are infrastructure renewals charge and current cost depreciation; these reflect projections of future movements in capital expenditure prices relative to RPI.

3 Operating profit before deduction of interest payments, corporation tax and payment of dividends. Actual profits will depend on costs incurred in meeting objectives and efficiencies made in practice.

3. SCOPE FOR COST SAVING THROUGH GREATER EFFICIENCY

The past performance of the water industry, other industries and the economy generally has been reviewed in order to assess the potential for improving efficiency over the next 10 years. Ofwat carried out comparative studies of costs, making due allowance for differences in operating conditions. Ofwat also commissioned research from experts in the field to report on the scope for such improvements in efficiency. This included work on operating costs and the cost of maintaining existing assets and adding new ones.

Many companies made submissions on efficiency which contributed advice, explained their special circumstances and indicated their view of the scope for further savings over the 10 years covered by the new price limits. All these were considered in reaching a judgement both of the overall scope for delivering services at lower prices and the position of each company.

Operating expenditure and capital expenditure both play an important part in determining the overall cost structure of the water industry. The Director has considered operating and capital costs consistently but separately, as he has seen no convincing evidence that relatively high operating expenditure can be explained by relatively low capital expenditure or vice versa. Once price limits are set, decisions on future trade-offs between or within these expenditure categories become a matter for the management of the company.

Operating expenditure

The Director has examined the scope for overall savings in operating costs relative to the RPI. Therefore he has not needed to make explicit assumptions about the composition of operating costs or about factors which might increase or reduce elements of costs.

Analysis undertaken for, and by, Ofwat confirms that companies should be able to provide existing levels of service at lower costs. In setting price limits, the Director considers it reasonable to allow for the industry, on average, to achieve continuing reductions in operating expenditure for existing services of 2% a year from 1995 to 2000 and further savings of 1% a year thereafter. (Where new obligations, increased demand or justified enhancements to levels of service involve increases in operating cost, these have been allowed for separately.) The higher figure up to the turn of the century reflects what has been achieved in other parts of the economy, especially where there has been pressure to reduce costs. In the water industry, there are increased opportunities consequent upon the change in the regulatory regime. The lower figure in the second period reflects the uncertainty in anticipating so far ahead what companies might be able to achieve.

The scope for lower costs as a result of increased efficiency will result from the ability of relatively less efficient companies to catch up with the more efficient, and from the ability of all companies, including those already deemed more efficient, to improve as technology and management practices develop. The precise balance between the two elements (company-specific and industry-wide) is a matter for judgement. In the period from 1995 to 2000, the Director has assumed broad equivalence between the company-specific and industry-wide elements in setting price limits.

The Director has focused on the unit costs of customer outputs (water delivered and sewage collected). He has based the judgements shown in Table 10 of the scope for reductions in operating costs for individual companies mainly on comparative analyses of operating costs, allowing for differences in companies' operating environments. These were based on models developed by Professor Mark Stewart of the University of Warwick (and published in Ofwat Research Papers 2, 3 and 4) but updated to reflect more recent data and comments from companies.

These studies show that companies' costs are affected by a wide variety of factors. Many of these factors are associated with the density of the populations that the companies serve. For instance, high densities mean both that there are relatively short lengths of pipe to maintain and that there may be greater opportunities to operate large treatment works.

For operating expenditure per unit of water delivered, the analysis carried out by Ofwat suggests that the most important explanatory factors are the length of the distribution system, the amount of pumping needed, the proportion of demand from large customers, the level of treatment provided, and the size of water treatment works. For operating expenditure per unit of sewage collected, the most important explanatory factors are the length of the collection network, the amount of pumping needed, the relative magnitude of trade and domestic effluent loads, the level of treatment provided, the size of sewage treatment works, and the methods available to companies for disposing of their sludge.

The Director has also taken into account companies' submissions on the effect of their special circumstances; evidence on individual company costs and efficiency improvements incorporated in SBPs; reviews of actual operating expenditure for individual companies in the first period compared with actual expenditure up to 1988-89 and the projections then assumed; and an assessment of comparative levels of service.

In broad terms, the company-specific element of the judgements on the scope for reductions in costs up to 2000 will bring most companies about half way from their existing cost levels to the costs of the more efficient companies. This approach takes account of the uncertainties involved in identifying an efficiency frontier, and is also designed to leave all companies incentives to achieve additional savings over and above those reflected in price limits.

In practice, efficiency improvements may be stepped rather than continuous. Although the judgements about the scope for cost savings taken account of in price limits have been applied across each year in the period 1995-96 to 2004-05, there is no presumption that the actual pattern of efficiency gains will mirror this profile. The 10 year price limit allows companies to take opportunities at the time most appropriate to their circumstances.

Table 10 Relative efficiency groups based on operating expenditure at 1992-93

Water service

More efficient (10 companies)	North West, Cambridge, Chester, East Surrey, Hartlepools, North East, North Surrey, Portsmouth, Sutton, York
Around average (14 companies)	Severn Trent, South West, Southern, Thames, Wessex, Yorkshire, Bournemouth & W Hampshire, Bristol, Essex & Suffolk, Mid Southern, South Staffordshire, Tendring Hundred, Three Valleys, Wrexham
Less efficient (6 companies)	Anglian, Dwr Cymru, Northumbrian, Folkestone, Mid Kent, South East

Notes

1 The range of assumed scope for efficiency savings is 1.0% pa to 3.5% pa for the period 1995-96 to 1999-00 (with 0.5% pa for small, efficient low bill companies).

2 There has been some additional differentiation of the figures within these groups.

Sewerage service

More efficient	North West, Yorkshire
Around average	Anglian, Dwr Cymru, Severn Trent, Southern, Thames, Wessex
Less efficient	Northumbrian, South West

Notes

1 The range of assumed scope for efficiency savings is 1.0% pa to 3.4% pa for the period 1995-96 to 1999-00.

2 There has been some additional differentiation of the figures within these groups.

Capital expenditure

The Director has also adopted a comparative approach to capital expenditure programmes. The scope for cost reduction has been assessed by comparing capital costs through an analysis of the cost base of the companies, that is of typical unit costs for specimen projects ("standard costs"), and also through comparative cost analysis carried out in respect of the implementation of the UWWTD. In addition, the Director has allowed for all companies to achieve a continuing annual reduction, reflecting continuing technical progress, of 1% a year.

Standard costs

In October 1993, companies were asked to submit estimates for the costs of construction and refurbishment of a full range of water mains, sewers, communication pipes and meters, and the costs of 17 specimen surface asset projects for the water service and 13 surface asset projects for the sewerage service. The results were analysed according to the method described below. Companies were told when their costs for individual specimen projects were significantly above those of the lower quartile.

Companies submitted standard costs again in their SBPs. In a number of cases there were significant revisions to standard costs from the earlier cost base submissions made by the companies. The review of standard costs has taken into account companies' explanations of their basis and points identified by Reporters, who were asked to confirm that the standard costs were derived from the same building blocks and company policies or practices as the capital expenditure programmes. Ofwat also commissioned consulting engineers to provide independent standard costs as a means of externally testing the companies' submissions. Consultants were also commissioned to review and assure the quality of the analysis of standard costs.

After taking account of special factors identified by companies and confirmed by Reporters, the range of standard costs for a number of activities remained wide. Some companies appear to be more efficient than others in delivering capital expenditure programmes. This relative efficiency between companies has been taken account of in the assessment of capital expenditure allowed for in the determinations.

The standard cost approach could not fully quantify the differences between companies or their individual circumstances. Accordingly a conservative approach has been adopted based on the derivation of a lower quartile yardstick for each standard cost item. These figures for the lower quartile were compared with independent standard costs produced by consultants.

A series of expenditure weighted adjustments has been calculated for each company based on the expectation that companies reporting standard costs above the yardstick could achieve a percentage reduction in their capital expenditure costs which would halve the gap between their standard cost and the yardstick by the end of the price limit period.

The weighted adjustments assume no change in costs in expenditure areas where the appropriate standard costs are at or below the yardstick.

The range of adjustments that have been applied to different companies are shown in Table 11.

Table 11 Standard cost adjustments

Comparative standard cost adjustments over the period 1995-96 to 2004-05				
	Range			Average
Water service capex adjustment				
Infrastructure assets	0.0%	to	8.7%	3.8%
Non-infrastructure assets	0.0%	to	7.5%	4.0%
Sewerage service capex adjustment				
Infrastructure assets	0.1%	to	8.5%	4.3%
Non-infrastructure assets	0.0%	to	5.8%	3.3%

Note

The average cost adjustments are weighted by the number of connected properties within each company.

Urban Waste Water Treatment Directive comparative unit costs

The detailed information in SBPs on the build up for the compliance programmes for the UWWTD has enabled comparisons to be drawn between companies for similar planned outputs. These comparisons have been particularly robust for continuous discharges and sludge disposal. From this information it has been possible to develop yardstick capital expenditure costs based on the lower cost companies. Where company projections were found to be in excess of the yardsticks the Director has assumed there is scope for efficiency savings reflecting a step half way to the yardstick.

By extending the comparative operating expenditure models for sewage treatment works it has been possible to develop yardsticks for the net additional operating expenditure associated with the UWWTD works. Where company projections were found to be in excess of the yardsticks the Director has assumed there is scope for efficiency savings.

The Director has assumed that companies will incur the lowest possible costs for works designed to implement the UWWTD. He is aware of the difficult conditions in many coastal towns. He notes, however, that local planning authorities have responsibilities in connection with the requirements of EC Directives. To the extent that local planning authorities might refuse consent for low cost solutions, the Director would assume that the company would appeal to the Secretary of State.

Continuing technical progress

In the light of analysis carried out by, and on behalf of, Ofwat, the Director has assumed when setting price limits that there is scope for continuing cost reductions of 1% a year in capital expenditure. Due to uncertainties in the timing and take up of newer and emerging technologies, a conservative judgement has been made. As a result, companies have an incentive for early adoption of lower cost technologies and practices and so increase their profits.

The assumed scope for continuing cost reduction incorporates cost reductions due to new technologies, technology transfers and improved procurement practices. It has been applied to costs after the assessment of planned activity levels and adjustment for comparative capital costs.

The judgement on continuing capital expenditure cost reductions was not applied to those companies which included targets of a similar magnitude in their SBPs, and where the Reporter has been able to confirm that programme estimates have been adjusted.

4. COSTS OF BASE SERVICE PROVISION

The analysis of the potential for reductions in the cost of delivering base service levels began with a comparison of existing costs to customers. To generate more effective and testing comparisons, total costs were disaggregated into three parts: operating expenditure, capital maintenance costs and the return on capital. Companies with high costs per unit of water delivered and sewage collected were asked to explain why their costs were higher than other companies.

Maintenance of current performance levels and associated asset serviceability does not add value to the utility business but maintains the business as a going concern. The Director has assessed what is needed to operate and preserve the serviceability of the appointed business' assets, taking account of the individual company circumstances. The costs of providing existing services include an allowance to cover the maintenance of existing assets. This involves consideration of expenditure on the maintenance of infrastructure (largely underground) and non-infrastructure (largely surface) assets and other investment, together with the associated accounting charges (infrastructure renewals charges (IRC) and current cost depreciation (CCD)).

Base operating expenditure

1992-93, the last year for which audited financial results are available for all companies, was taken as the base year for the assessment of base operating expenditure. To ensure that this provided a proper starting point for the future, regulatory accounts figures were adjusted where costs in 1992-93 were considered untypical of those expected to apply in future years. The efficiency savings assessed on the basis described in Section 3 were applied year by year to this base operating expenditure from 1995-96, the first year of the new price limits, until 2004-05.

Capital maintenance

The Director has a duty to ensure that companies are able to provide a satisfactory service from their assets. Capital maintenance is the expenditure required to maintain service capability of assets for both current and future customers. In accounting terms, capital maintenance is reflected in charges made against profit. These comprise the IRC for infrastructure assets and an appropriate level of CCD for non-infrastructure assets.

Price limits provide for levels of capital maintenance expenditure considered necessary for each company to maintain the serviceability of its assets, and accounting charges which match the expenditure incurred or expected to be incurred over an appropriate period.

The assessment of the necessary expenditure and its translation into accounting charges requires reliable information on the past and current performance of the asset stock. The companies, in preparing their SBPs, have carried out extensive research into the condition and serviceability of their assets which provides a strong platform for future reviews. The work done will assist the companies in the more effective focusing of capital investment in the future.

Infrastructure assets

The Director considers that, for this Periodic Review at least, the most appropriate way to assess the future level of expenditure required for infrastructure asset maintenance is to examine the evidence on the past relationship between such expenditure and the level of service provided to customers. Historical data, including that from the 1980s Corporate Plans of the 10 water authorities, has been analysed to assess trends in serviceability and expenditure. After comparison with the evidence in SBPs for each company and the expenditure levels proposed there, an assessment was made of the future level of expenditure needed to maintain serviceability. This review of historical data indicates that there has not been a general decline of serviceability in recent years.

Generally the Director's assessment has been to allow for continuation of recent levels of capital maintenance expenditure for the future. In a limited number of cases where the serviceability information presents an uncertain picture, an increase over recent levels has been allowed for within price limits.

The 10 years covered by new price limits are characterised by substantial quality enhancement programmes, particularly associated with water distribution assets and the sewerage service. These programmes interact with capital maintenance; the bigger the quality programme, the smaller might be the need for any additional expenditure for base service provision. No specific deduction has been made for this within the Director's assessment.

For the purposes of determining the appropriate price limit, the Director has allowed for an infrastructure renewals charge in his financial projections equal to the average level of expenditure on maintaining infrastructure assets over the 15 years from 1990-91 to 2004-05.

Non-infrastructure assets

Each company's past expenditure on capital maintenance and plans for the future have been reviewed and compared using the ratio of annual average capital maintenance expenditure to gross value of assets (which reflects the expected average life of the asset stock). The ratio was expressed in comparative terms using 1992-93 connected properties as a denominator.

In view of the similarity of the processes and form of construction of assets across the water industry, and the relatively long timescale over which existing assets have been constructed, the Director believes that there needs to be good evidence for one company to justify a level of capital maintenance expenditure very different from that of other companies. He has concluded that expenditure does not need to exceed the level in those companies which have experienced the greatest historic problems with their surface asset stock. Since these companies have been able to maintain serviceability at this level of expenditure, this provides a robust limit for other companies.

Company proposals for CCD were also compared between companies using the ratio of CCD to gross value of assets, and using 1992-93 connected properties as a denominator. Given the downward trend in construction and property prices in recent years, combined with advances in technology, the Director adopted in his financial projections the lower of the asset values at 31 March 1993 shown by each company in its 1992-93 accounts and in its SBP. In calculating CCD on existing assets, the Director took account of the value of assets under construction at 31 March 1993.

Where inter-company comparisons showed unexplained disparities, asset lives were extended (and in some cases reduced) to reflect the relatively consistent engineering lives shown in SBPs, and to reflect a consistent approach to the categorisation of expenditure as between non-depreciable expenditure and that with short, medium or long asset lives. Appropriate allowances were made for 'work in progress' and for grants and capital contributions.

The reassessment of CCD by standardising asset lives does not affect the present value of future cash flows: if asset lives are increased, current cost depreciation is reduced and capital values will be correspondingly higher and remunerated by the return on capital. In other words, only the timing of future revenue is affected, not the overall level of remuneration.

The Director took account of CCD calculated as above in his financial projections to determine price limits which fulfil his statutory duties. The depreciation provisions actually made in a company's accounts are a matter for the company's judgement, in consultation with its auditors. The Director has accepted the SBP projections of historic cost depreciation on existing tangible assets, which are relevant in assessing the likely position of financial indicators.

Base return on capital

The companies made an overall return of 13% in real terms in 1992-93, on the capital base which the Director has determined for regulatory purposes. This is explained further in Section 8. The Director does not consider that it is necessary for water companies to make continuing returns of this magnitude to be able to finance their functions.

He is, nevertheless, concerned not to make any retrospective adjustments, nor to override any legitimate expectations which shareholders may have had at privatisation. He has set price limits on the assumption that the return on the regulatory capital base would decline towards the figure which he regards appropriate for new investment over the next 10 years, which extends more than 15 years after privatisation.

Although shareholders' expectations in 1989 allowed for significant risks, those who bought the original shares and retained them up to March 1994 would have made an annual return of between 25 and 34% in real terms after payment of income tax at the standard rate. In the different circumstances of 1994, more modest returns should provide a sufficient incentive for shareholders to continue to finance the companies.

Capital expenditure prices

Most companies have agreed Licence amendments which mean that changes in capital expenditure prices can no longer be taken into account in changing price limits between Periodic Reviews. For these companies, the Director has assumed that capital expenditure prices will show a recovery from current depressed levels. For those companies retaining the provision for interim determinations[4], price limits have been set on the basis of 1992-93 construction price levels. These assumptions have been applied to capital maintenance and to other elements of the future capital programme.

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[4] Anglian, North West, Northumbrian and Yorkshire.

5. ENHANCED SERVICE LEVELS

In the water industry, the Director considers that future improvements in levels of service should be achieved without higher price limits, as in other utilities. Improvements will arise as an indirect consequence of investment to meet existing or new quality obligations; other improvements can be achieved through more efficient targeting of capital maintenance expenditure or through changes in operational procedures which involve no extra cost. Improvement can also be financed through achieving efficiency savings over and above those assumed in setting the price limits.

Companies have asked their customers about their priorities for improvements in service and their willingness to pay for these. The results were set out in the Market Plans each company published last year and customers were consulted on those plans. This valuable work has created the ability for companies to prioritise service improvements to be achieved through improved efficiency and as by-products of other expenditure.

For most water companies, progress towards achieving the improvements proposed in SBPs should be possible without any special provision being made in the price limit. However, some water companies and most sewerage companies have proposed in their SBPs a scale of enhancements to levels of service over and above those that can be achieved solely through the measures outlined above.

In *Setting Price Limits for Water and Sewerage Services*, the Director explained that he would expect customers to finance such additional enhancements through increased prices only where the company had made an exceptionally strong case. In making decisions he has taken into account:

- the impact any enhancement would have on future prices, having regard to the existing level of bills and the impact of other factors, especially new and existing obligations;

- whether there are service issues specific to that company which require particular consideration; and

- whether there is evidence from the Market Plan process that at least a majority of customers are prepared to pay extra for the higher level of service.

Particular attention has been paid to the views of the relevant CSC. The Director has been advised by the Chairman of each Committee before making his decision.

For many companies the Director concluded that there is neither a pressing need for the scale of improvement in service levels proposed nor sufficient evidence of collective customer support to justify any allowance in price limits. In a number of cases, affordability has been the critical issue because of the high level of existing bills.

The exceptions relate mainly to sewer flooding where generally only modest improvements can be made without specific provision in price limits, and where there is evidence that customers are willing to pay for improvements. £590 million (in 1993-94 prices) has therefore been allowed for over the next 10 years to address sewer flooding problems. As a result, over half of the 20,000 properties identified by the companies in 1993 as being at risk of sewer flooding will have this risk removed.

6. SUPPLY/DEMAND BALANCE

Setting Price Limits for Water and Sewerage Services explained the Director's view that expenditure to meet supply/demand imbalances should, as far as practicable, be met by those whose demand is increasing and should largely be paid for by changes in bills (and revenue) and not K. He has considered the expenditure proposals in SBPs under the 2 broad headings of servicing new development and meeting growth in demand from existing and new customers.

Costs of servicing new developments

When new properties are connected for water and sewerage services, costs are incurred in extending the local network, to connect the new properties. These costs should be met by developers and by customers in new properties.

The Director believes that, for customers in new properties, the volumetric element of annual charges should cover any additional resource and treatment costs. The volumetric element also contributes to costs incurred in the local distribution network. But in addition, companies may receive contributions from developers (or requisition payments), and, in the case of connections for domestic purposes, infrastructure charges.

The Director believes therefore that infrastructure charges should relate to local distribution costs only, rather than increases in resources and treatment capacity. If customers in new properties are not to cross-subsidise, or be cross-subsidised by, existing customers, infrastructure charges should be set at a level that achieves a broad balance between the local system costs associated with connecting new properties and contributions from developers plus the appropriate element of annual charges.

The Director has considered the evidence in the companies' SBPs and has concluded that a charge limit in 1995-96 for all companies of £200 each for water and for sewerage at 1995-96 prices is appropriate on this basis. While there is no simple and straightforward solution to setting infrastructure charges, a charge at this level should avoid risk of substantial cross-subsidisation between customers in new properties and other customers.

Several companies have argued that the costs of providing capacity at treatment works for localised new development, particularly for sewerage services in rural areas, justify a higher charge. The Director has considered these arguments, but has concluded that, without significant changes to the operation of infrastructure charges (requiring Licence amendments), the £200 limit should be applied in all areas. This provides for administrative simplicity while avoiding substantial cross-subsidy between different customer groups.

The Director has also considered the arguments for phasing any reduction of infrastructure charges, and concluded that the balance of advantage lies with a move from next April to uniform charge limits.

In setting price limits, the Director has allowed for new development costs and contributions consistent with infrastructure charges of £200 for each service.

Costs of meeting growth in demand

Because water is not metered for most households, increases in capacity have in the past generally been met from higher charges. In time this should change as more customers are metered. In the meantime the Director has looked very carefully at the expenditure which companies expect to incur to meet additional demand either from individual customers or from an increase in the number of customers.

Companies are under a duty to carry out their functions in an economical and efficient way. The Director believes that this generally implies the metering of new properties. He also expects companies to install meter boxes whenever communication or service pipes are replaced, or similar work carried out such as replacement of stop taps. The Director has set price limits on this basis.

The Director believes that all customers should have easy access to the option of paying for their water by meter. Where water companies have installed meter boxes, customers will be able to opt for a meter without paying for the initial cost of installation. Most companies have also introduced lower charges for meter options in cases where a meter box has not been installed.

Given the relatively low growth in demand for water, most companies are not facing a large imbalance between supply and demand. However, some companies face a significant shortfall in capacity, and the companies concerned were asked to set out in their SBPs an assessment of the cheapest way of bringing supply and demand back into balance - which may involve metering or leakage control rather than new resource development. In a number of cases, costs for some selective metering have been reflected in price limits. The costs allowed for take account of the scope for low-cost metering of properties when communication pipes or stop taps are replaced or where meter boxes have already been installed. An increase in metering of households will enable companies to maintain their distribution systems more cheaply as leaks will be easier to find.

Selective metering allowed for in setting price limits, together with metering of new properties and optional metering, could result in 20% of households being metered by 2005 compared with 6% now. In some areas, half of households could be paying by volume by that date.

For many companies, compulsory metering of existing households is not cost effective. For those companies, the Director has allowed costs, based on industry yardsticks, to fund the overall increases in average volumes of water available for supply and distribution input or of sewage treated. Some companies have argued that additional expenditure needs to be allowed for increased leakage control activity. The Director believes that the levels of capital maintenance expenditure allowed for are sufficient to maintain current leakage levels. Where companies face an imbalance, they will need to determine the most cost effective means of bridging it, within the yardstick costs allowed for. Where companies proposed to improve the supply position to reduce, for example, the potential frequency of hosepipe bans, the Director has considered whether there was clear evidence that customers are willing to pay for those improvements. However, he has only allowed for costs where the average volume of water available for supply, or sewage volumes and loads to be treated, are projected to increase.

7. QUALITY ENHANCEMENTS

The companies set out their plans for additional capital and operating expenditure associated with quality enhancements in their SBPs. These projections represented the culmination of the detailed work on the definition of the quality enhancement functions which took place within the quadripartite discussions between Ofwat, the NRA, the Department of the Environment and the water companies and the costing of the implications as part of the development of the SBP. Each company's proposals for quality enhancement had been agreed with the respective quality regulators (DWI and NRA) prior to submission of the SBPs. In addition, on 6 July the Secretaries of State announced a programme of environmental expenditure by sewerage companies designed to improve river water quality.

In considering the funding needs associated with quality enhancements, only programmes of work that have been confirmed by the quality regulators have been allowed for in price limits. Other expenditure identified by companies on drinking water or environmental quality has been considered under other purpose headings.

Estimates of expenditure allowed for in setting price limits to carry out quality obligations have involved comparisons between companies and judgements on prospects for improvements in efficiency in operating costs and on unit capital costs and capital productivity (see Section 3). Specific comparisons have also been made between companies of the costs of specific activities in achieving the UWWTD.

Water service

Expenditure on improvements to drinking water quality has only been allowed for in price limits as a quality enhancement where specific legal undertakings have been given by companies to the Secretaries of State to comply with the Drinking Water Quality Regulations, or where the DWI has confirmed the need to make future improvements in quality to deal with changing environmental conditions.

Over the 10 years covered by the new price limits, additional capital expenditure on water quality enhancements allowed for in the determinations totals £3.9 billion, an average of £390 million a year at 1993-94 prices. Price limits provide for a total additional operating expenditure of £0.8 billion, an average of £83 million a year at 1993-94 prices.

As a consequence of this expenditure, charges will be higher than they otherwise would have been. But the expenditure will achieve considerable additional benefits to customers either directly or indirectly. In the period up to March 2000 companies will have achieved:

- the construction of over 120 pesticide removal plants and 30 nitrate removal plants, ensuring continued compliance with the stringent standards in the Water Quality Regulations (this work represents the completion of the existing compliance programmes);

- the modification of over 70 water treatment works to reduce the risk of *Cryptosporidium* entering the distribution systems;

- fitting of treatment at nearly 100 extra water sources to reduce lead take up from lead piping to reduce the risk of water at customers' taps not complying with the current limits; and

- the renovation of over 25,000 km of water distribution mains (8% of the total system) to reduce the problems of manganese and iron discolouration, polyaromatic hydrocarbons (PAHs), and turbidity. This is in addition to maintenance work on the distribution system.

Sewerage service

The main area of expenditure on improved quality in the sewerage service that has been allowed for in price limits relates to compliance with the UWWTD. Capital expenditure on this Directive allowed for in the determinations totals around £6 billion plus a further £0.8 billion for discharges to bathing waters, at 1993-94 prices, over the next 10 years.

This expenditure assumes:

- completion of the Bathing Waters Programme consistent with the UWWTD;

- ending of sewage sludge dumping in the sea by 1998; and

- compliance with the requirements of the UWWTD by the due dates, based on guidelines issued by the NRA for the implementation of the Directive and subsequent clarifications.

Expenditure has also been included for improvements in river water quality, over and above that which will be achieved by implementation of the UWWTD. This has been based on the decisions made by the Secretaries of State from a priority list drawn up by the NRA.

Expenditure on achieving legal requirements in the sewerage service will achieve considerable benefits for the environment over the next 10 years. These include:

- the provision for the first time of a minimum of primary treatment for nearly 150 continuous discharges to coastal waters, serving a population equivalent of over 7 million;

- the provision for the first time of a minimum of secondary treatment for over 350 continuous discharges to estuarial water, serving a population equivalent of over 15 million;

- the upgrading of nearly 600 sewage treatment works discharging to freshwaters, serving a population equivalent of nearly 19 million to comply with the requirements of the UWWTD;

- the upgrading of over 2,400 combined sewer overflows to reduce the environmental impact of their discharges to coastal, estuarial and freshwaters; and

- expenditure of over £500 million in the period 1995-96 to 1999-2000 to achieve environmental improvements in selected river catchments, over and above that achieved by the UWWTD. These catchments should include the rivers Mersey, Aire, Calder, Norfolk Broads, Worcestershire Stour, Erewash, Chelt, and Tame.

Over the 10 years covered by the new price limits, additional capital expenditure on sewerage quality enhancements allowed for in the determinations totals £7.3 billion, an average of £730 million a year at 1993-94 prices. Price limits also provide for a total additional operating expenditure of £1.6 billion, an annual average of £160 million.

In 1989 the initial setting of price limits allowed for a capital expenditure total of £3.0 billion at 1993-94 prices, for sewerage quality enhancements in the period up to 1994-95, with projections of £1.5 billion and £0.6 billion in the following quinquennia up to 2004-05. Increases in operating expenditure were also allowed for.

The advancement of the Bathing Waters Programme announced in 1990 has increased the total to £3.6 billion at 1993-94 prices, in the period up to 1994-95, while the UWWTD and national environmental programme have increased the projected expenditure in the next 2 quinquennia to £5.3 billion and £2.0 billion respectively. Latest figures for expenditure on sewerage quality enhancements in the 15 years from 1990 to 2005, including that allowed for within price limits, are more than double those reflected in initial price limits.

The Director has sought guidance from the Secretary of State on completion dates for some of South West Water's marine schemes. The expenditure for 4 schemes required to be completed under the timetable of the UWWTD can be phased over a longer period while allowing South West Water to meet its statutory obligations. This rephasing has been allowed for in setting the price limits for the company.

8. FINANCIAL ISSUES

Previous sections have set out how the broad level of costs allowed for individual companies has been assessed. Price limits are then set at levels which produce appropriate revenues over 10 years. To do this, it has been assumed that customers should meet operating and capital maintenance costs on a year by year basis. The Director has then assessed what return on capital is appropriate, over and above the revenue required to cover operating costs and meet capital maintenance provisions on an annual basis, and to remunerate net new investment, that is capital expenditure in excess of capital maintenance charges (IRC and CCD).

In judging this return, the Director has taken a view on the cost of capital on new investment, the appropriate return on existing assets and the headroom within profits which is appropriate to the specific risk factors affecting each company and which provides incentives to companies to carry out their functions efficiently. He has also reviewed the likely position of financial indicators such as interest and dividend covers, which are of importance to providers of debt and equity finance, over the period to the turn of the century. Although price limits are set for a 10 year period, either the Director or the company can seek a further Periodic Review after 5 years.

On the basis of his assessment of the appropriate valuation of existing assets, the returns currently being earned by companies are around 13% in real terms, after allowing for mainstream and advance corporation tax. The Director's assessment of the cost of capital for water and sewerage companies - the rate of return needed to finance new investment - is between 5 and 6% in real terms, after business taxes[5]. In setting price limits, the Director has allowed for overall returns on capital which converge from the levels currently being earned on existing assets towards the return on new capital over the 10 years covered by the price limits, but allowing for continuing headroom in profits to reflect company-specific risks. The rate of return actually earned will depend on how well companies are able to manage within their price limits while carrying out their obligations. For example, companies may earn higher returns if they can achieve additional efficiency savings, above those that have been assumed for normally efficient water companies.

Capital values

Regulation of the water industry is based on a system of price limits, rather than controls on profits or rates of return. But if the Director is to be satisfied that companies are able to finance their functions, he needs to understand the implications of different price limits for both the absolute level of profit, and hence financial ratios of concern to lenders and investors, and for rates of return.

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[5]In considering the cost of capital, Advance Corporation Tax can be considered as a personal tax, as the associated tax credit reduces the income tax paid by investors on dividends. Projected average returns quoted below are after deduction of all corporation tax.

For the purposes of assessing rates of return, the Director has adopted as a measure of a company's capital the market valuation around the time of initial price setting, adjusted to take account of the net (ie after allowing for current cost depreciation) new capital expenditure allowed for in initial price limits. He has in addition allowed for new obligations imposed since 1989 not yet reflected in price limits, and made adjustments for actual changes in national construction prices. The basis of the calculation was explained in *Setting Price Limits for Water and Sewerage Services.*

These capital values therefore start with a direct measure of the value placed by the financial markets on each company's capital. For water and sewerage companies, he has based this on the average capitalisation over the first 200 days' trading. Where, as in the case of water only companies, direct measures of market values in 1989 are not available, alternative measures have been adopted which the Director believes provide a broadly comparable assessment.

Initial capital values in 1989, based on an assessment of market values, amounted to £8 billion for the 31 water, and water and sewerage companies (at 1993-94 prices). By 31 March 1995, taking account of the expenditure allowed for in initial price limits by the Secretaries of State, this value will have increased to £16 billion. On the basis of the net new capital expenditure allowed for in the price limits now determined, the capital value of the companies will increase to £27 billion by 31 March 2005.

Cost of capital on new investment

In 1991, Ofwat published a consultation paper on the cost of capital. Evidence from the financial markets has been monitored, together with subsequent research and comments from individual companies, the water industry collectively and from City institutions.

There is no single fully satisfactory approach to determining the cost of capital. The assessments made in 1991 have been reviewed in the light of more recent evidence, in particular on risk-free returns, equity returns and the equity risk premium. This has been done using both the Capital Asset Pricing Model (CAPM) and the Dividend Growth Model (DGM).

The 1991 paper suggested that the risk-free rate could be expected to lie in the range of 2 to 4% in real terms. The redemption yield on index-linked gilts can be used as a proxy for the risk-free rate, although they are not totally risk free. In the light of recent evidence, the Director considers that it would be reasonable to base future assumptions about long-term risk-free rates on a figure of between 3 and 4% in real terms.

In 1991, there were conflicting views and approaches on future equity returns and the premium of equity returns over the risk-free rate. Looking at the long-term evidence, in the context of the DGM, the return on equities was around 7% in real terms. Recent figures for equity returns support this. Compared with a forward looking assessment of the real risk-free rate of 3 to 4%, this would imply an equity premium of around 3 to 4 percentage points. This is considerably less than the conventional estimates under CAPM which were current in 1991; they then appeared to be in the range 6 to 8 percentage points. Recent academic work has tended to support lower estimates of the risk premium.

An additional approach adopted by the Monopolies and Mergers Commission (MMC) in its report on British Gas was to review expectations of fund managers. That approach suggested that the expected return on equity was around 7% in real terms, implying a premium over expected gilts yields of 3.5 percentage points. A more extensive review carried out subsequently by Bacon & Woodrow, a leading firm of actuaries, suggested an average expectation of long-term average equity returns nearer 6% in real terms. Taken with the assessment of the risk-free rate, this evidence supports a figure for the risk *premium of around 3 percentage points.*

Water and sewerage companies appear to be less risky than companies generally[6]. This evidence therefore continues to support an assessment that the required real return on equity for water companies is in the range 5 to 7%.

The return on equity needs to be combined with a cost of debt to give an overall weighted average cost of capital.

The margin over the risk-free rate for a water company borrowing in 1991 was assessed at about 1 percentage point. Subsequent evidence of margins on water company bonds, particularly for those directly related to the core business, suggests that this margin is higher than generally experienced. Overall, therefore, a margin of 1 percentage point to cover all borrowings would be more than adequate.

The Director has therefore not changed his view that the cost of capital for water and sewerage companies - the return that needs to be earned on new investment in order to remunerate the necessary finance - is in the range 5 to 6% in real terms, after business taxes.

The cost of capital is likely to be higher for the smallest water only companies, because of the additional costs associated with raising capital, or for companies whose financial profile is significantly worse than average. In particular, companies whose gearing is significantly above 50% (measured as debt divided by debt plus equity) may face a higher cost of capital.

To take account of these factors, the Director has allowed for a margin in post-tax returns of up to 0.75 percentage points for small and highly geared water only companies over water and sewerage companies.

Return on capital

Returns currently being earned by water and water and sewerage companies are currently well above this assessment of the cost of capital on new investment. In 1992-93, current

[6]This can be assessed, for example, through measures of relative risk such as β factors in the Capital Asset Pricing Model.

cost operating profit, less corporation tax, represented a real return of 13% of capital values on average. The Director indicated, in *Setting Price Limits for Water and Sewerage Services,* that he would set price limits so that returns converged towards the cost of capital on new investment over the 10 years covered by the new price limits.

Companies are affected to different extents by changing conditions, and investors in companies which bear greater risks, for example those companies which have given up the ability to seek interim adjustments in price limits because of changes in construction prices, can expect to earn higher returns on a continuing basis. Price limits for individual companies therefore reflect ongoing post-tax returns which take account of these factors. The Director has also allowed for sufficient headroom in profits, so that the key financial indicators, interest cover and dividend cover, are adequate.

There is no simple way to deal with these uncertainties and downside risks which companies could face. The impact of general changes in capital expenditure prices or revenues from measured customers will vary across companies. For example, the impact of removing protection against changes in capital expenditure prices will depend on the scale and mix of the prospective capital programme in relation to a company's size, and the scope a company has for rearranging and reprioritising individual projects should prices change. In the same way, measured revenue risk depends not only on the proportion of measured income, but also on the division between household and business measured income, and the number of large business customers a company has.

It is therefore difficult to assess the impact of these uncertainties on the cost of capital for each company. Available market evidence does not enable the relative risk position of different companies to be sufficiently distinguished. The risk companies face is also limited in practice by their ability to manage their overall expenditure programmes, and by the possibility of a company calling for a Periodic Review after a further 5 years. In judging the speed, and extent, of the reduction in returns, financial projections of the companies have been prepared which show the potential financial position of each company on a number of assumptions of the future state of the economy. Alternative scenarios were developed taking account of factors such as possible changes in RPI, construction prices, interest rates and of the impact of macro-economic changes on the demand for water, in order to assess the effect of these changes on the financial position of each company. On the basis of such work, the Director has made judgements on the appropriate size of such headroom in determining K factors, and the need for a higher K factor in the first 5 years.

Because the expenditure allowed for in the determinations is higher in the first 5 years than subsequently, front-loading of K factors has been required for some companies. The extent of any front-loading also takes account of the potential impact of those business risks which, under the terms of the Licence for the company in question, are not eligible for an interim determination before the next Periodic Review.

Profits need to be sufficient to remunerate investors and lenders; but they also need to cover corporation tax payments. Allowance has therefore been made in setting price limits for the likely tax paying position of each company. The difference between returns before and after business taxes (the tax wedge) was analysed in the 1991 consultation paper. The subsequent reduction in the rate of Advance Corporation Tax (ACT) increases the wedge, but changes in other factors since 1991 would seem to offset this. Taking account of the likely tax paying position of the companies, the evidence supports tax wedges on marginal expenditure broadly in the ranges 0.25 to 1 percentage point for water and sewerage companies, and 1 to 2 percentage points for water only companies which are fully tax paying. The total tax wedge due to corporation tax is generally higher than the tax wedge appropriate for new investment. Decisions on the financing of net new investment affect the marginal tax wedge, but the scope for management to reduce total tax payments significantly is limited, particularly for water only companies, although some scope inevitably remains.

In the light of all these factors, the Director has made projections of the future financial position of the companies. These are not intended to be forecasts; the financial performance of a company in practice will depend both on management decisions and on the precise external environment in which it operates. However, the Director has set price limits on the expectation that real returns for most companies would fall, over the 10 years covered by the new price limits, to a range of 6 to 7% after corporation tax. Returns for water only companies can be expected, on average, to be above those for water and sewerage companies.

9. TARIFF BASKET AND CHARGING METHODS

Tariff basket

Although the financial modelling focuses on revenue and on resulting financial projections, price limits have to be set on a basis of the tariff basket calculation as set out in Condition B of the Licence. This takes account, in particular, of the numbers of customers in up to 5 different charging categories, distinguishing between measured and unmeasured supplies for water supply, sewerage services and trade effluent. Charges for measured customers take account of their demands for water and sewerage services, while charges for unmeasured customers are, in the main, based on the rateable value of their property.

The Director is concerned to ensure that the tariff basket calculation takes proper account of the position agreed with companies in their Tariff Action Plans submitted during 1993. These Tariff Action Plans set out companies' proposals for tariffs in the future, in particular concerning rebalancing between different tariff elements such as standing and variable charges and different customer groups, for example measured and unmeasured households, or domestic and business customers. This rebalancing is necessary to ensure that charges more properly reflect costs. The Director has also indicated to water and sewerage companies that he will expect them to balance tariffs between water and sewerage services in a way which achieves a broad equality of current cost rates of return.

The tariff basket calculation also reflects assumptions about volumes of water delivered and waste water returned and the numbers of customers in different categories. The Director has ensured that assumptions underpinning the assessment of future demands for services are consistent with those used for charging purposes.

Because different tariff structures generate different amounts of revenue for a given K factor, the Director will monitor companies' tariff structures against their Tariff Action Plans, and will, where necessary, consider enforcement action if companies fail to proceed on the basis to which they have committed themselves.

New charging methods

Under present legislation, all companies are under an obligation to stop using rateable values as a basis of charge beyond 31 March 2000. A number of companies have sought provision within price limits for additional costs to introduce a new basis of unmeasured charge.

To meet the requirements of Condition E of the Licence to avoid undue discrimination or preference, the Director expects any alternative unmeasured charging systems to be consistent with the criteria he set out in *Paying for Water: The Way Ahead* (December 1991). In particular, these need to be fair, with charges broadly related to costs and hence to water use, and simple, so that customers understand how their bill is made up and what they can do to influence it. However, the Director has not received any proposals, other than selective metering, which meet these criteria any better than charges related to rateable values.

One or two of the options which might be available in future could facilitate low cost charging schemes within base operating expenditure. It is doubtful whether more costly alternatives would be any more likely to meet the criteria referred to above. The Director therefore considers that any costs of introducing new unmeasured charging systems should be accommodated within the allowance for base service provision included in the price limits.

Where compulsory metering is part of the most cost-effective approach to reducing imbalances between demand and supply, this element of additional costs has been allowed. It has been shown that such programmes can be carried out cheaply when linked with maintenance of the underground network.

CUSTOMER INVOLVEMENT, AFFORDABILITY AND LEVELS OF SERVICE

Statement by the Chairmen of the ten Ofwat Customer Service Committees

OVERVIEW

Our involvement in the Periodic Review, on behalf of the customers in our respective areas, has evolved considerably during the last 2 years. Following his invitation to the Customer Service Committees (CSCs) to comment on Market Plans prepared by the companies, the Director suggested that we, as Chairmen, be given access to the detailed confidential information provided by the companies, including their Strategic Business Plans (SBPs).

This has considerably strengthened the regulatory process, enabling us to provide a balance on behalf of customers generally to the aspirations of the companies. Without it, we would not have appreciated fully the companies' individual positions, nor would the Director have given so much weight to the views we expressed on behalf of customers. In short, what might have been seen as views which were too subjective and superficial became informed commentaries. It has inevitably, from time to time, led to tensions with the Director and with the companies as we have continuously promoted the interests of customers, ensuring that their major concerns were always high up on the Director's agenda. However, throughout the process, these tensions have been of a constructive nature which has led to an end result which truly reflects the wishes of the majority of customers.

We can recommend the process and outcome as representing the best deal possible for the majority of customers. It presents a responsible and reasonable challenge to the companies to manage their affairs for the optimum benefit of their customers and their shareholders.

THE PROCESS

Customer involvement

We believe that the efforts made by the Director to involve customers in the Periodic Review are an important step forward in the way private sector monopolies are regulated. We warmly welcomed the approach and are pleased that companies also did. It has ensured that customers' interests were on the agenda right through the Review process.

The Director commissioned his own market research into customer views and willingness to pay for service improvements in May 1992 and February 1993.

In the Autumn of 1992, companies were asked to consult their customers on what quality of service they wanted and how much they were prepared to pay. Companies undertook a number of initiatives, including market research, discussions in the public forum with the CSCs, detailed customer surveys and discussions with focus groups. The results were built into companies' Market Plans on which public reaction was again sought. CSCs made further detailed observations to companies on behalf of customers.

The clear conclusion was that willingness and ability to pay ever higher water bills were the key issues. It was disappointing that not all companies responded to that conclusion. Many customers were happy with quality and levels of service. Others wanted improvements in one or both of these. But in very few cases was there any enthusiasm for real price increases. Overall, customers regarded improvements in the taste, smell and appearance of their water supply as more important than environmental improvements.

Apart from these general messages, the Market Planning process highlighted important priorities for customers. It showed, for instance, the relative weighting which customers attach to different service improvements such as reducing the chance of hosepipe bans compared with preventing sewer flooding. This will be valuable to companies when targeting expenditure in the light of the price limits.

A number of companies are continuing the process of customer consultation and making it an ongoing feature of their business planning. We welcome that and we recommend it to all companies as good practice.

CSC involvement

In addition to commenting on company Market Plans, CSCs have also provided direct advice to the Director on willingness and ability to pay for improvements in levels of service. This advice has been based on views from household and business customers about price increases and water companies' performance. CSCs have collected comprehensive complaints statistics over the last 4 years which strongly support their advice to the Director.

Ofwat National Customer Council

The Ofwat National Customer Council (ONCC) has complemented the work of the 10 regional Ofwat CSCs in protecting the interests of customers by focusing the collective views of Chairmen on the key issues. ONCC advised the Director that customers' concern with price was central to protecting customer interests. Given the other pressures on bills, we suggested that he should place the burden of proof on the companies to justify the need for price increases to improve levels of service. ONCC wrote to the Secretaries of State for the Environment and for Wales asking that they do everything in their power to reduce the impact on bills of implementing EC directives.

CSC Chairmen

We have had access to the widest possible range of information, some of it confidential, to enable us to represent the interests of customers to the Director to the best effect. This information includes the SBPs on which we commented in advance of the draft determinations on 20 May. We were also present at the formal meetings during June and July between the Director and the respective water companies to hear their representations on the draft determinations. Following those meetings, we commented further to the Director. We had the opportunity to tell companies what we thought were the important issues for customers in the light of the company presentations and submissions.

THE OUTCOME

Results

We believe that the process we have followed has ensured that the key customer issues and concerns have been properly taken into account by the Director.

We are pleased that the quality regulators now have regard for the impact of higher standards on customers' bills before imposing new obligations. As a result, customers are better protected. However, we shall continue to be vigilant in relation to proposals emanating from Europe and continue our dialogue with the Government.

The resultant K factors represent as fair a deal for customers as possible. They show a substantial reduction from the K factors proposed by the companies in their Market Plans. The Director has to strike a balance between customers and the ability of companies to finance their functions. We have seen our role as protecting customers. We have pressed throughout for price limits as low as possible, subject to preserving standards of service. We are pleased therefore that it has been possible to improve some standards of service, notably to reduce the risk of sewer flooding.

The balance between prices and environmental improvement is a most difficult issue. We are very conscious that in some parts of the country, especially in the coastal regions, price rises for some customers may be hard to bear. It is regrettable that the costs of meeting higher quality standards outweigh the savings which the Director has achieved through promoting greater efficiency and allowing a lower rate of return on capital.

Affordability

Although the Director has been able to moderate the steep increase in prices experienced in the first 5 years since privatisation, price rises will still be above inflation for most customers. In parts of the country, water bills are already high in relation to average household income. The national average water bill of a little over 1% of average household income masks the problem of affordability for low income customers, especially in areas where water bills are high. Customers need to pay their water bills. But companies have to help them to do so. They should be sensitive to the problems of customers and continue to look for ever more flexible payment systems for those who really need them. ONCC will also keep pressing Department of Social Security to improve payment arrangements from benefits and to reflect more fully the cost of water in the amounts paid to customers in need.

CSCs will also work with business customers and with their representatives to advise on ways in which water bills could be reduced through better management of their water and sewerage systems and to promote best practice in the efficient use of water.

Levels of service

We believe that the Director has used the right criteria to decide whether the cost of improved services should be reflected in prices. The criteria and the approach are set out in Section 5 of the Director's paper. The application of these criteria has meant that many of the companies' proposals for expenditure have not been included in price limits. We agree with this. In most cases, the companies failed to prove that a sufficiently large majority of customers wanted to pay for the improvements. We believe that when faced with a choice between higher bills to pay for improved service, or reductions in bills for existing service, most customers, would choose the latter. We advised the Director to that effect. The exception is sewage flooding. Most customers have supported improvements to alleviate these most unpleasant incidents.

Company public documents

The Director has asked companies to publish documents explaining to customers the effect of the price limit on bills and what they can expect in terms of services and improvements in quality. These documents, which will be published between now and Spring 1995, should build on the company market research and other customer consultation. We see them as completing the process of involving customers in the price Review. We hope that they will show a positive approach from companies to meet customer expectations. We believe services can be improved by targeting expenditure on quality and capital maintenance, and through efficiency gains. We would be disappointed if companies were to take the view that there is little scope for service improvements or use the Periodic Review as an excuse for justifying lapses in present standards. We know that customers will be looking for maintenance and improvement of services. If that does not happen, there will be even more complaints. We expect companies to consult CSCs in the preparation of their plans for customers. CSCs, for their part, stand ready to be fully involved in this most important step forward.

Anthony Clothier	Chairman, Wessex CSC
Dr Roger Corbett	Chairman, Eastern CSC
Jim Gardner CBE DL	Chairman, Northumbria CSC and Chairman, ONCC
Anthony Goldstone MBE DL FCA	Chairman, North West CSC
Elizabeth Monck	Chairman, Thames CSC
Professor Judith Rees	Chairman, Southern CSC
Archdeacon Raymond Roberts CB	Chairman, CSC for Wales
Jessica Thomas	Chairwoman, CSC for the South West
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