



THE APPROACH TO DEPRECIATION FOR THE PERIODIC REVIEW 2004

A consultation paper

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1. Introduction

1.1 Purpose

1.1.1 The purpose of this consultation paper is to:

- consider the issues raised following periodic review 1999 (PR99) about our approach to depreciation; and
- to consult on possible approaches for the next periodic review in 2004 (PR04).

We set out our intention to consult on these issues in 'The Ofwat forward programme 2002-03 to 2004-05 draft for consultation' (November 2001).

1.1.2 The contents of this paper are described below:

- Section 2 explains the links between capital expenditure, depreciation and price limits;
- Section 3 covers our proposals for PR04 and the alternative approaches that we have considered;
- Section 4 covers the approaches to depreciation taken by other utility regulators; and
- Section 5 sets out our approach to depreciation at PR99. This section includes a number of issues relating to our approach are discussed and our reasons for reviewing it.

1.2 Background and summary

1.2.1 Our approach to price setting is based on accounting charges and not expenditure. Capital maintenance charges account for around 30% of the average household bill of £233 (2000-01 prices). For the period 2000-05 depreciation accounts for 20% of the total average bill. The remaining 10% relates to infrastructure renewals charges which are not discussed here. The amount allowed for depreciation is therefore an essential element in our price setting process.

1.2.2 Capital expenditure is not directly reflected in price limits (and hence customers' bills) in the year in which it is incurred. Instead, the cost is recognised over the period for which the assets will be used. This is through either the current cost depreciation charge (CCD) or the infrastructure renewals charge (IRC) (for expenditure on maintenance of the network); and a return on the capital invested. Depreciation recognises the costs of capital expenditure over time. In general, water industry assets have average lives of more than 30 years. Because of the long lives of the assets used in the water industry, there is a balance to be struck between capital expenditure funded by current customers and that funded by future generations. We use current cost accounting which more accurately reflects the economic consumption of assets with long lives.

1.2.3 Many of the assumptions companies make to calculate their depreciation charges are subjective. They also vary across the industry. We want the depreciation allowed for in price limits to reflect the use of assets to provide the water and sewerage services. We want to make sure that price limits are not unduly influenced by the company's choice of accounting policies. We took account of this in our approach to depreciation at PR99.

1.2.4 CCD and the regulatory capital value are linked. Consequently depreciation is concerned with the timing of recognising capital expenditure and hence the balance of bills between current and future customers.

1.2.5 In our approach to depreciation we consider the assets on which the depreciation charge is based. We consider the asset base in two parts.

- Investment in assets which deliver the base service levels currently provided, termed the base service assets.
- Investment in assets which enhance and add to the asset base. These assets provide new services or facilities beyond those necessary to maintain existing operating capability.

We consider the calculation of depreciation in two parts.

- Depreciation on new capital expenditure. This accounts for around 40% of the depreciation we assumed in setting prices for 2000-05.
- Depreciation on existing assets (that is, on past capital expenditure). This accounts for 60% of the depreciation we assumed in setting prices for 2000-05.

1.2.6 At PR99 we adopted a similar approach to that taken for the first periodic review in 1994 (PR94) to calculate depreciation on new capital expenditure. We applied a standard set of asset lives to all new capital expenditure. A different standard apportionment was used for water and sewerage companies and water only companies.

1.2.7 For PR99 we used companies' projections of depreciation for existing assets. Because these projections form the largest part of the depreciation charge we checked whether they were reasonable. To do this we reviewed the overall level of the depreciation charge included in price limits. Our hypothesis was that, over the long term, for a pool of assets which is neither growing or declining in terms of outputs generated, the CCD charged should be comparable to the capital expenditure required to maintain and replace the assets. (In the water industry this is called MNI expenditure).

1.2.8 In general for the water industry at present, the total CCD over a reasonably long period of time is higher than MNI expenditure. Much of the difference is explained by the recent growth in the assets due to investment to meet quality obligations. Even when this has been taken into account, there is still a gap between CCD and MNI expenditure for most companies. At PR99 where companies did not provide sound explanations for this difference, a downward adjustment was made to CCD in determining price limits. For PR99 this particular element of our approach on average accounted for 2.5% of the reduction in customers' bills.

1.2.9 Most companies accepted this approach in principle but disagreed with what they perceived as a mechanistic application of the adjustment. The Competition Commission (CC) recommended in its reports on Mid Kent Water plc and Sutton and East Surrey Water plc, following PR99, that our approach to depreciation should be given further study.

1.2.10 In order to make sure that concerns about the process adopted for PR99 are addressed and that we have a sound methodology and basis for calculation for PR04, we are consulting on a number of issues. The key issues on which we are seeking views are detailed below.

Q1: Do we need a check and challenge on the overall level of depreciation allowed in price limits?

Q2: Is the comparison of depreciation charges with long term maintenance expenditure a valid basis for the check?

Q3: What are the valid reasons for differences in depreciation charges and maintenance expenditure projections?

Q4: What is your preferred approach to the assessment of depreciation that should be allowed in price limits?

Q5: What is your view on our calculations at PR99? Issues on specific elements of the calculation are discussed in detail in section 4.

Q6: Should we continue to use standard lives and standard apportionment of capital expenditure to those lives to achieve consistency between companies in our determinations?

There is a series of numbered questions in the text which cover these points in more detail.

1.2.11 We have listed a number of past publications discussing our approach to depreciation, which are still relevant in Appendix A. These could inform your responses.

- 1.2.12 This paper and the responses to it will help us develop our approach to depreciation for PR04. Our preliminary view is that we should keep the comparison of CCD and MNI to provide a check on the overall level of CCD allowed in price limits for PR04. We will ask companies to provide detailed explanations for any differences. If these explanations are unsatisfactory then we may adjust CCD. We recognise the need for transparency in deciding if the explanations are robust.
- 1.2.13 We will issue a further RD letter summarising the responses to this consultation in the summer of 2002. Our proposed approach to depreciation for PR04 will be set out in our consultation paper 'Ofwat's approach to the periodic review 2004' to be published in October 2002.

2. Depreciation and price limits

2.1 How capital expenditure is reflected in price limits

2.1.1 At periodic reviews the amount of revenue which a company needs to recover from its customers is calculated by ensuring that it has sufficient income to:

- continue to operate and maintain its assets;
- finance new capital expenditure; and
- provide a reasonable return on the capital invested in the business.

This is known as the revenue requirement and is made up of five main elements.

- Operating costs. These are the day to day costs of running the business.
- CCD and the infrastructure renewals charge (IRC). All capital expenditure (for new assets and to replace or maintain existing assets) is included in the revenue requirement through either the CCD charge or the IRC. We discuss this in more detail below.
- Return on capital. The regulatory capital value (RCV) is the value we use to represent the amount shareholders and lenders have invested in the business. Price limits include a return on the RCV to allow companies to finance their functions.
- Taxation. The water industry pays tax, in the same way as any other company in the UK, on the profits that it makes.

2.2 Infrastructure and non-infrastructure assets

2.2.1 Within the water industry, assets are classified as either infrastructure assets or non-infrastructure assets. In broad terms, infrastructure assets are underground assets such as pipes which form part of either the water or sewerage networks. Each of these networks can be considered as an indivisible whole. Non-infrastructure assets are above ground assets such as treatment works. Generally, they can be identified separately and do not represent one indivisible whole. We therefore treat infrastructure and non-infrastructure assets differently when we set price limits. Companies also treat the two differently when they account for their capital expenditure.

2.2.2 Infrastructure assets are not depreciated. The industry adopted infrastructure renewals accounting when it was privatised. Under this method, the infrastructure asset network is treated as a single asset system to be maintained in perpetuity rather than a collection of individual assets each with its own asset life and maintenance requirements.

- 2.2.3 An annual charge, the IRC is made against profits for the annualised costs of maintaining the system at its current level of operations. This is calculated separately for the water and sewerage services.
- 2.2.4 Non-infrastructure assets are treated according to conventional accounting practice. The cost of the asset is recognised as a fixed asset (or for price setting purposes added to the RCV). Each year the RCV is adjusted for inflation and also reduced to reflect the use of the asset stock over time. This reduction in value (also called depreciation) is calculated by spreading the cost of the asset over its expected useful life. The method of calculating depreciation should reflect as fairly as possible the pattern in which the assets are consumed. The RCV is not equal to the current replacement cost of assets. At privatisation the amount shareholders paid for shares in the water companies was considerably less than the replacement cost of the assets used by the industry.
- 2.2.5 In the water industry, the average life of non-infrastructure assets is long. It is estimated to be over 30 years for both the water and sewerage services. Some assets such as computer software and some light mobile plant have short lives (around 5 years) while others like water and sewerage treatment works and service reservoirs are much longer (around 60 years).
- 2.2.6 The interaction of the RCV and CCD charges is important. It means that CCD is largely about the timing of recognising capital expenditure and not about the value to be funded. The RCV is higher if CCD charges are lower. Companies therefore earn a return on a higher capital base. In principle, this will offset the costs of financing the asset for a longer period of time on average.

2.3 **Current cost accounting**

- 2.3.1 For regulatory purposes, current cost accounting (CCA) is used. CCA ensures that assets are valued at their cost today. This is important where assets have very long (or in the case of infrastructure assets – indefinite) lives. Because of inflation, the original cost of the assets is substantially less than their value today. Both non-infrastructure assets and infrastructure assets are valued at the cost of replacing them today. This is defined as the cost of an asset of equal productive capability to satisfy the remaining service potential of the asset being valued (also known as the Modern Equivalent Asset Value – MEA value). The industry re-values its assets every five years. For the years between MEA revaluations, we assume that the value of the assets is simply increased by RPI. The CCD charge is based on the MEA value of the assets.

2.4 **Objectives for depreciation in setting price limits**

2.4.1 As explained in section 2.2 capital expenditure is treated differently for infrastructure and non-infrastructure assets. This paper considers only non-infrastructure assets and the CCD charge on those assets which needs to be reflected in price limits.

2.4.2 The conventional accounting objective for depreciation is to ensure that the cost of the asset is reflected in the accounts of the business at the rate at which the economic value of the asset is depleted over its useful life.

2.4.3 Properly applied this will also achieve two further objectives.

- To ensure that customers' bills reflect a fair charge for the use of the assets and that the balance of those charges is fairly distributed between present and future customers; and
- To allow companies to generate sufficient funds to finance the replacement and maintenance of their asset stock.

However the asset valuation and depreciation policies adopted by the water companies vary widely. This results in different depreciation charges for companies with similar asset bases.

2.4.4 A company will wish to ensure that it is adequately remunerated for the costs of investment both in the past and in the future. This is an issue concerning the amount of expenditure needed to maintain the operating capability of the systems and is not dealt with in this paper. However, once this quantum is established, the pattern of depreciation charges on that amount establishes the timing of cashflows for companies. This needs to ensure that customers pay a fair amount for the use of the assets in each year.

2.4.5 Our approach to this at the last price review is explained in more detail in section 4.

3. Proposals for the next periodic review

3.1 There are a number of approaches to depreciation we could adopt. These are considered below. In addition, we have considered the approaches used by other regulators in section 4.3, and assessed whether they may be suitable for the water industry.

3.2 A possible methodology for price setting in 2004

This paper sets out a wide range of issues regarding our approach to depreciation. The responses to this consultation will inform our approach for price setting in 2004 for the period 2005 and beyond. At present our view is that we should broadly follow the principles used in 1999. These are to:

- ensure that price limits are not unduly influenced by the choice of accounting policies used by individual companies; and
- to provide a check on the reasonableness of the overall level of depreciation.

3.2.1 There is a need for greater transparency surrounding our approach.

3.2.2 For depreciation on new assets, we are proposing that the company specific allocation of capital expenditure to infrastructure and non-infrastructure assets is retained. Standard lives and apportionments would then be used to calculate depreciation on non-infrastructure expenditure. Where a company believes that there are good reasons why its mix of assets is different to the standard mix, we will consider the case made by the company. The questions on which we are seeking views in respect of this are set out in sections 5.2.6 to 5.2.14.

3.2.3 We also intend to retain a check on the level of depreciation by comparing CCD with actual and projected MNI expenditure over time. We are seeking views on the details of the way in which this comparison is made. These issues are set out in sections 5.2.15 to 5.2.33. Where there is a difference between CCD and MNI expenditure, we will ask companies to explain the difference.

3.2.4 We discuss some of the reasons why differences might arise in section 5.2. We want to understand which of these account for the biggest part of the difference and if there are additional reasons to those we have exposed.

3.2.5 Where a company does not provide robust and acceptable explanations for differences, the CCD charge may be adjusted. This could either be by simply deducting the amount which has not been explained from the total charge or through a present value calculation similar to that used at PR99 (see Appendix E1 and E2).

3.2.6 Our approach to depreciation depends upon the accuracy of MEA numbers and we continually try to increase our overall understanding of the relationship between MEA values and CCD. We will visit some of the companies to gain an understanding of their fixed asset systems and how their depreciation charges are built up. We will review information available on CCD and MEAs and discuss with the companies the trends and relationships in this information.

Q7: Do you agree, in general, with the approach proposed for PR04? If not, what approach should be adopted and why?

Q8: Are any of the alternatives suggested in section 3.3 preferable?

Q9: What are the most significant reasons for differences between CCD and MNI projections?

Q10: How should the adjustment, if any, to the depreciation charge be calculated?

3.3 **Alternative approaches**

3.3.1 Some of the alternative approaches to depreciation which we have considered are discussed below.

Detailed consideration of MEA values

3.3.2 An alternative to using a high level check on depreciation by comparing CCD with MNI expenditure is to develop a thorough understanding of the MEA value upon which the CCD charge is based and to challenge this value. This would involve significant time and resource, both for us and the companies. The size of adjustments to MEAs at each of the past reviews does not give us confidence in the robustness of the valuations. It is, therefore, unlikely that this could be used as a practical approach. It would also involve more detailed regulation rather than a high level approach.

Renewals accounting approach

- 3.3.3 Rather than using a conventional depreciation charge, a renewals charge, similar to the infrastructure renewals charge for infrastructure assets, could be introduced. This approach would be similar to that used by the Office of the Rail Regulator, as discussed in section 4.3.4. It has some appeal but in the water industry the profile of MNI can vary significantly from year to year, particularly for smaller water only companies. It is very different to the profiles of infrastructure renewals expenditure (IRE). To simply allow MNI expenditure, would lead to volatile prices to customers. Use of a periodic average would reduce this problem but the choice of period could be problematic and vary considerably from company to company. A further concern would be the acceptability of such a change to accounting standards institutions and tax authorities. Infrastructure renewals accounting is no longer used for statutory accounts purposes. While we have retained this particular methodology for regulatory purposes we believe that, in general, statutory and regulatory accounting requirements should be the same.

Economic depreciation approach

- 3.3.4 In broad terms, economic depreciation is the present value of the change in economic value of an asset from one period to the next. This change provides a measure of asset consumption.
- 3.3.5 Academics suggest that there is a clear link between economic depreciation and asset performance or serviceability and therefore expenditure required to maintain a desired level of asset serviceability should provide a measure of economic depreciation.
- 3.3.6 This approach to depreciation involves assumptions about measurement, technological change and market risks and is complex to understand and implement. It would also increase the divergence between depreciation used to set price limits and more conventional accounting practices which are widely used and well understood.

4. Different regulatory approaches to depreciation

4.1 The funding of capital expenditure and depreciation is a feature of the way in which all UK utility regulators determine price limits. However, different approaches have been taken by regulators for different industries. The main reasons for this relate to the specific characteristics of the capital investment programmes and the asset base of each industry. Also the regulators have different perceptions of the objectives for depreciation in setting price limits. This section considers the approach to depreciation adopted for the different utilities. It also considers the way in which the Competition Commission (CC) calculated depreciation in its redetermination of price limits for Mid Kent Water and Sutton and East Surrey Water in 2000¹.

4.2 Competition Commission

4.2.1 In its re-determination of price limits for Mid Kent Water and Sutton & East Surrey Water after PR99, the CC expressed concern “at the way the introduction of broad equivalence (BE) (the comparison of CCD with MNI expenditure) has been managed. In our view a cross-check policy would have called for an examination of the causes of differences between CCD and BE calculations with the aim of making appropriate adjustments either to the CCD and to the RCVs from which it is derived or the broad equivalence data itself”.²

4.2.2 The CC noted that “there may be an arguable case for basing price determinations on projected cash flow for non-infrastructure capital maintenance expenditure (MNI) rather than an accounting-based CCD, as is already effectively done for infrastructure maintenance³”. But they envisaged that this would constitute a substantial policy change by Ofwat and the implications would have to be fully explored. It was not our intention to introduce a renewal charge for non-infrastructure asset maintenance. This approach was considered in section 3.3.

4.2.3 The purpose of comparing the MNI expenditure and CCD over a reasonably long time period was to check the level of depreciation on existing assets which was taken directly from companies’ business plans. In our view these amounts should be subject to challenge in the same way as other company projections are scrutinised. In the absence of any explanation for the differences between CCD and MNI expenditure, we adjusted the CCD charges. The CC concluded, in the absence of persuasive evidence, that the depreciation adjustment was unlikely to produce a more equitable outcome than unadjusted CCD over time. The CC did accept that being able to check the validity of the CCD calculations

¹ Mid Kent Water & Sutton & East Surrey Water plc – report on the references under sections 12 and 14 of the Water Industry Act 1991

² Mid Kent Water & Sutton & East Surrey Water plc – report on the references under sections 12 and 14 of the Water Industry Act 1991- paragraph 2.190 (MKT) and paragraph 2.186 (SES)

³ Mid Kent Water & Sutton & East Surrey Water plc – report on the references under sections 12 and 14 of the Water Industry Act 1991 -paragraph 2.192 (MKT) and paragraph 2.185 (SES)

by reference to the actual and projected cash spend was desirable. It recommended that the matter of the adjustment made to depreciation be given further study.

4.2.4 For Mid Kent and Sutton & East Surrey Water, the CC adopted the approach outlined below.

- It projected a depreciation charge to maintain the asset base existing at 31 March 2000. This was equal to the total CCD charge in the 1999-2000 regulatory accounts which reflected the latest MEA revaluation. The CC recognised that some existing assets would have to be replaced during the period for which prices were set. They concluded that the impact on the CCD charge would be small as the addition to the charge from the replacement assets would be offset by the reduction to the charge from no longer depreciating the assets that were replaced. As a check on the level of depreciation, the CC compared the 1999-2000 CCD charge with the average MNI expenditure for the period 1992-93 to 1999-2000 for each company. For Mid Kent and Sutton & East Surrey the two were comparable and therefore no adjustment was made to CCD⁴.
- Depreciation on enhancement expenditure was calculated by apportioning the enhancement capex across five asset life categories. The apportionment was determined by the CC's engineering consultants, Scott Wilson. Different asset lives were given to each category of enhancement expenditure analysed by the CC (quality, growth, meters and new development expenditure). This approach is broadly similar to that adopted by Ofwat, but varies in the way in which expenditure has been analysed.

4.2.5 The CC's approach relied heavily on the CCD charge from the 1999-2000 accounts and therefore on the MEA valuation also made in that year. While the CC's approach had some validity for Mid Kent Water and Sutton and East Surrey Water, this did not hold for the remainder of the industry. We applied the same methodology to the rest of the industry and found significant differences for 19 of the remaining 21 companies. The CC did not state in their reports what action they would have taken if the 1999-2000 CCD charge was higher than the average MNI expenditure. If an adjustment were made for the whole of the difference this would result in reductions in CCD which are substantially larger than those made by Ofwat in PR99. Any approach adopted at a periodic review must be applicable to all companies. We therefore can not simply adopt the same approach as the CC at future periodic reviews.

⁴ Competition Commission – Mid Kent Water & Sutton & East Surrey Water plc – report on the references under sections 12 and 14 of the Water Industry Act 1991 – Appendix 8.5 page AP8 SE 2 & 3 (SES) and Appendix 8.5 page AP8 (5) MK 2 & 3 (MKT)

4.3 Other regulators

Office of Gas and Electricity markets (Ofgem)

- 4.3.1 Ofgem uses depreciation as a means for investors to recover the cost of the financial investment which they have made in the past. This approach applies to the electricity distribution and transmission businesses and for Transco. The depreciation charge is based on the RCV. The RCV is transparent, well understood and is set by the regulator. This avoids any subjectivity in valuing assets and hence the depreciation charge. Unlike in water, for the gas and electricity industries, the value of the shares at privatisation (upon which the initial RCV is based) and the value of the assets were not too dissimilar.
- 4.3.2 Like Ofgem, we could use an agreed number such as the RCV on which to base depreciation. This would eliminate the need for depreciation charges based on physical assets. However, the use of the RCV to drive depreciation charges in the water industry is complicated because of the magnitude of the difference between the value of the assets at privatisation and the initial RCV (the value paid by investors for shares in the water industry). At privatisation the net MEA value (after depreciation) of the assets was around 15 times greater than the initial RCV. Currently, the net MEA value is around six times greater than the RCV. This illustrates that although the MEA value of the assets acquired since privatisation increases the RCV thus bringing the two values closer, the difference is still substantial. In order to use the RCV as a basis for calculating depreciation, we would have to make assumptions about the difference, such as why it arose and which assets it applies to. For example, did all of the difference relate to the infrastructure assets which are not depreciated? Another consideration is that depreciation charges based on the RCV would not necessarily reflect the replacement cost of the assets and hence the value consumed in delivering the water supply and sewerage services.
- 4.3.3 At the last price review for Transco (September 2001), because of the amount of capital maintenance expenditure required, the use of conventional depreciation charges in setting price limits did not allow the company sufficient cash to maintain the required credit rating and return to equity. Consequently, Ofgem chose to remunerate a proportion of this expenditure on a pay-as-you-go basis. Infrastructure renewals accounting, which we apply to the water and sewerage network, remunerates the replacement of infrastructure assets in a similar way. We discuss our concerns about this approach in section 3.3.3.

Office of the Rail Regulator (ORR)

- 4.3.4 ORR also adopted a pay-as-you go approach to renewals expenditure for their review of Railtrack's access charges (October 2000). This means that renewals expenditure projected by ORR forms part of the revenue requirement and customers pay for actual capital maintenance expenditure instead of a depreciation charge. Under this approach, the RCV remains constant unless the network is enhanced (or reduced). Again, this approach is similar to our approach for infrastructure assets.

Office for the Regulation of Electricity & Gas (Northern Ireland) (Ofreg)

- 4.3.5 Ofreg published a consultation paper in November 2001, consulting on the Transmission and Distribution Price Control Review for Northern Ireland Electricity. Ofreg's approach to depreciation focussed on pre-privatisation and post-privatisation assets and concluded that each type has a different depreciation profile. For post-privatisation assets a 'kinked' 40 year depreciation policy was adopted meaning that a slightly different depreciation rate was adopted for the first 20 years compared to the last 20 years.

5. Our approach at PR99

5.1 Why we need an approach to depreciation

5.1.1 Many of the assumptions which companies make in order to calculate their depreciation charges are subjective. They also vary considerably across the industry. In the past, companies with similar assets have had large differences in CCD. These differences have arisen because of differences in:

- the valuation of the assets;
- the economic lives assigned to each class of asset; and
- the allocation of capital expenditure to asset life categories.

5.1.2 In addition to the regulatory accounts, the water industry also provides financial information in its statutory accounts. The statutory accounts are one of the primary vehicles used by the companies to present information to shareholders, lenders and other stakeholders. These accounts also include depreciation charges which are based on the historic costs of the assets – historic cost depreciation or HCD. Because of the audience for the statutory accounts, the HCD charges and the assumptions which underpin them are subject to a high level of scrutiny. We believe that the assumptions which underpin the HCD and CCD should be the same except for the value of the assets being depreciated. However, we are not confident that this applies in all cases. As the audience for the regulatory accounts is not as wide as that for the statutory accounts, the level of challenge to the assumptions underpinning CCD from other parties is not always significant.

5.1.3 We must apply thorough and robust scrutiny and challenge to companies values. At PR99 if we had used companies projections of depreciation customers' bills would be around 5% higher (including the 2.5% reduction discussed in section 1.2.7).

5.2 Approach to depreciation for PR99 and reasons for reviewing it

5.2.1 For both PR94 and PR99 we adopted a common approach to the issues discussed in section 5.1.1 above so that customers' bills reflect a reasonable charge for the use of the assets required to deliver the water supply and sewerage services. Discussions with companies following PR99, and the CC's recommendations have highlighted a need to review our approach to CCD for future periodic reviews.

5.2.2 Appendix B includes flow charts setting out how we calculated depreciation. The calculations and issues for consultation are explained in more detail below.

CCD on new capital expenditure

- 5.2.3 A worked example for the calculation of CCD on new capital expenditure is included in Appendix C.
- 5.2.4 The CCD charge is calculated to give an even charge for each year of the asset life. This is also known as the straight line method. The charge is calculated as shown below.
- Split capital expenditure between expenditure to maintain and replace existing assets (MNI expenditure) and expenditure to expand and enhance the asset base (enhancement expenditure).
 - Split capital enhancement expenditure between infrastructure and non-infrastructure assets. Non-infrastructure expenditure is depreciated. MNI expenditure, by definition, relates entirely to non-infrastructure assets and is not split any further.
 - Allocate non-infrastructure expenditure (both MNI expenditure and the element of capital enhancement expenditure) across different asset life categories. For PR94 we used three asset life categories (short, medium and long). For PR99, we added two categories (very short and medium-long) to give a more accurate estimate of depreciation.

Asset lives

- 5.2.5 For price setting purposes, asset lives in the water industry are analysed using five different asset life categories. The lives which companies use for each category vary; for example, the asset lives assigned to the short life category ranges from 7 to 13 years, and the medium long category from 30 to 50 years.
- 5.2.6 When setting price limits, we use the same lives for the whole industry. This ensures that price limits are not unduly influenced by different accounting policies. At PR99 we used standard lives for each of the five asset life categories. These were based on the most common asset lives used by the companies (also called the industry mode). With the exception of some small water only companies, companies generally accepted our assumptions. The asset life categories and standard lives used for each category are set out below.

Category	Range	Standard life used at PR99
Very short	0-5 years	5 years
Short	6-15 years	10 years
Medium	16-30 years	20 years
Medium long	31-50 years	40 years
Long	over 50 years	60 years

Q11: Should we continue to use the industry standard mode for asset lives?

Q12: Do you expect the asset lives reported and used at PR99 of 5, 10, 20, 40, and 60 years to change significantly for PR04? If so, why?

Classification of capital expenditure

5.2.7 For regulatory purposes we classify capital expenditure according to the purpose for which it will be used. MNI expenditure and capital enhancement expenditure are already separately identified.

5.2.8 We allocate capital enhancement expenditure between infrastructure expenditure (which is not depreciated) and non-infrastructure expenditure (which is depreciated). We do this on a company by company basis to reflect the nature of the capital programme undertaken by each company. For PR99 this was built up from information the companies provided in their business plans about the proportion of infrastructure expenditure for each capital scheme.

Q13: Should we continue to allocate expenditure between infrastructure and non-infrastructure assets on a company specific basis?

Non-infrastructure capital expenditure

5.2.9 For both PR94 and PR99, there were wide variations in the assumptions used in the companies' business plans for allocating non-infrastructure capital expenditure across the five asset life categories. To ensure that charges to customers were not unduly influenced by companies' choice of depreciation policies, we used a standard allocation for all companies. This standard allocation is also called standard apportionment. We used a different standard apportionment for the water only companies. This reflected their concerns that the asset life apportionment for smaller companies is significantly different to that for the industry as a whole.

MNI and capital enhancement expenditure

5.2.10 The standard apportionment for capital enhancement and MNI expenditure was derived using information provided by companies in their asset inventory submissions (August 1998). We took into account any updates from the business plan submissions. The submission split the MEA value into different asset types across the five asset life categories detailed in section 5.2.6. We used a comparative approach to derive the proportions for PR99, which reflected our view of the industry's capital programme.

5.2.11 The standard apportionment used for capital enhancement expenditure for water and sewerage companies and water only companies was as follows:

	Water & sewerage companies		Water only companies
	Water	Sewerage	
Very short	0%	0%	0%
Short	5%	5%	9%
Medium	30%	38%	16%
Medium long	5%	10%	8%
Long	60%	45%	67%
Land	0%	2%	0%

5.2.12 The standard apportionment used for MNI expenditure for water and sewerage companies and water only companies was as follows:

	Water & sewerage companies		Water only companies
	Water	Sewerage	
Very short	8%	5%	7%
Short	22%	20%	32%
Medium	42%	50%	26%
Medium long	3%	5%	6%
Long	25%	20%	29%

5.2.13 We used different apportionments to calculate CCD on MNI expenditure and on capital enhancement expenditure. MNI expenditure is incurred in the maintenance and replacement of the entire asset base including not only operational assets but also assets such as offices, vehicles and computers. Enhancement expenditure is generally incurred in improving and adding to the operational assets such as treatment works. We use different apportionments in order to reflect that a greater proportion of MNI expenditure will be incurred in the replacement of shorter life assets.

5.2.14 Companies argue that the apportionments should be company specific. They state that the apportionments in their business plans reflect their individual circumstances and investment programmes. Our approach was designed to reduce the effects of differing accounting policies while still reflecting the nature of the expenditure companies incur.

Q14: How different should the apportionments for MNI expenditure and capital enhancement expenditure be?

Q15: Should we use a different apportionment for water only companies?

Q16: Our method of calculating the standard apportionment used in PR99 is set out in section 5.2.10. Assuming standard apportionments are retained, should we use the same method for PR04?

CCD on existing assets

- 5.2.15 Companies provided projections of CCD on existing assets in their business plans. For PR99, existing assets covered all assets which the companies owned at 31 March 1998. 1997-98 was the base year for the 1999 periodic review. As noted in section 5.1.1 both the MEA values and depreciation policies are subjective and vary from company to company. For PR99 we did not want to simply accept the companies' projections without challenging them.
- 5.2.16 We tested the level of depreciation to determine if the projections were reasonable. Where companies did not explain why their charges did not meet the test, we reduced their depreciation charges. The test and the calculation of the adjustment to depreciation are discussed in sections 5.2.18 to 5.2.22 below. Although we reduced CCD charges, companies are still able to recover the costs of past investment because of the interaction of the RCV and CCD, as discussed in section 2.2.6.
- 5.2.17 In general, companies agree with the need for a check on the overall level of depreciation. But they believe we did not use the comparison with capital maintenance expenditure as a test, but instead adjusted all charges mechanistically.

Comparison of CCD with MNI expenditure

- 5.2.18 The test we used for the depreciation charge was to compare it with the expenditure to maintain and replace the assets (capital maintenance expenditure). The policies adopted by the companies drive these projections. Where the accounting and service lives of assets are the same for a pool of assets in a steady state, there should be broad equivalence in the long-run between capital maintenance expenditure and the current cost depreciation charge. In simple terms, the CCD on existing assets falls over time as assets become fully depreciated and drop out of the calculation. CCD on new expenditure increases over time as more expenditure is added each year. If there is no expenditure to add to or enhance the asset base (that is, it is in a steady state) then the total depreciation charge should remain constant. The drop in CCD on existing assets will be equal to the increase in CCD on new expenditure. The overall level of depreciation should be the same as the expenditure to replace the assets as they reach the end of their lives. To demonstrate this principle, we have included a simple example in Appendix D.
- 5.2.19 In order to assume a long term balance between CCD and MNI expenditure, the asset base to which the CCD and MNI expenditure relate must be in a steady state; that is, neither growing nor declining. In the water industry investment in the quality programme has resulted in a growing asset base. However, we believe it is possible to identify the pool of assets which provide a base level of service. This pool can be considered to be in a steady state. While there may be expenditure which adds to the asset base, our classification of capital expenditure as MNI

expenditure or enhancement expenditure allows us to identify this element. The CCD on the base service assets can then be compared to the expenditure to maintain that level of service. The assumptions we made at PR99 about steady state are discussed further in sections 5.2.23 and 5.2.26.

Calculation of the adjustment

5.2.20 For PR99 we considered the 1992-93 asset base to be in a steady state, and representing the pool of assets which provided base service levels. The substantial expenditure to enhance the asset base in the period since 1992-93, and depreciation on that expenditure was excluded from the comparison. We compared the depreciation on the 1992-93 assets with MNI expenditure projections over a period of 23 years from 1992-93 to 2014-15. We also took into account the interaction between depreciation and the RCV.

5.2.21 We calculated the present value of CCD for the 23 years and compared this with the present value of MNI expenditure over the same period. If the difference in net present value was within a tolerance limit equivalent to 3% of the turnover, we considered that the depreciation charge was comparable to the MNI expenditure and no further action was required. If the present value of the CCD charge was higher than that of MNI expenditure, and where companies did not provide reasons for the difference, we reduced the CCD until the difference reached the tolerance limit. We have included a worked example in Appendix E to show how we calculated the adjustment for PR99.

5.2.22 Since PR99 companies have raised a number of specific issues regarding the calculation of the adjustment. These are discussed below.

Lack of a steady state of the asset base

5.2.23 The reasons why 1992-93 was chosen as the base year for PR99 are listed below.

- Depreciation on enhancement expenditure from 1992-93 onwards is excluded from the calculation of depreciation. This is substantial because the asset base has grown significantly since then.
- The long-term MNI projections do not take account of growth in the asset base and simply mirrored the levels projected for the five years of the next price setting period. The projections therefore related to the maintenance of the existing base service position only. Because some of the assets constructed after 1992-93 will need to be replaced by 2014-15, some increase in MNI expenditure would be expected over time. To ensure a like for like comparison, the CCD projections should not include this growth either.
- Data from before 1992-93 is not robust.

5.2.24 Companies argue that the 1992-93 asset base is not in a steady state, and that a steady state will not exist until the completion of a full asset lifecycle (that is when every asset in the asset base has been fully depreciated and replaced). Theoretically this is correct, but the industry existed for a very long period before privatisation, largely in its current form. The 1992-93 asset base should therefore have completed a full lifecycle by now.

5.2.25 At some point in the future we will need to include the replacement of assets constructed after 1992-93 in the comparison. This will largely depend upon the basis of MNI projections. If MNI projections are properly assessed over the long term, and demonstrate an increase over time to reflect growth of the asset base, then the CCD charge should reflect the same growth.

5.2.26 If we retain the 1992-93 asset base as the starting point for our comparison, this would go some way to addressing companies' concerns about the steady state. The 1992-93 asset base will be five years older and a larger proportion of it will have been replaced. But, by doing this, we exclude an increasing proportion of the CCD charge from the test. Expenditure to enhance the asset base between 1992-93 has been significant. One alternative would be to move the starting point forward five years to 1997-98 to give a basis for comparison for PR04. Depreciation on expenditure to expand the asset base between 1992-93 and 1997-98 is approximately £325m per annum. This is around 30% of the total depreciation charge for 2000-05.

Q17: Is the 1992-93 asset base an appropriate starting point for the comparison of CCD and MNI expenditure? If not, what base should we use?

Q18: Should we bring the start point forward to include more of the asset base constructed after 1992-93? Is 1997-98 an appropriate starting point for PR04?

The length of time for which the comparison is made

5.2.27 For CCD to exactly equal MNI expenditure, we must compare the two over the life of the longest asset in the pool. For the water industry this would exceed 60 years. It is unlikely that companies would be able to provide robust projections of MNI expenditure for the next 60 years. Our analysis shows that CCD and MNI expenditure should be broadly comparable for a reasonably long period such as 20 to 25 years. At PR99 we consulted on the period over which the comparison should be made in 'The proposed framework and approach to the 1999 Periodic review – A consultation paper'. Responses to the consultation ranged from the life of the asset, to 20 to 30 years, or the less specific 'long' or 'very long' term.

5.2.28 For PR99 we judged the 23 year period from 1992-93 to be long enough to compare CCD and MNI expenditure but not so long that MNI projections would become less robust. For PR99 companies focussed on

the short term up to 2010. Projections were required in business plans up to 2015 but in most instances companies assumed the same level of expenditure for 2010-15 as for the previous five years. For PR04 we have asked companies to consider a long term capital maintenance planning horizon rather than focus on the short term. (MD161 - 'Maintaining serviceability to customers') This should result in better long term projections of MNI.

Q19: Over what period do you think we should compare CCD and MNI expenditure?

Q20: Do you agree that the time period over which we make the comparison should be extended to match the capital maintenance planning horizon?

Tolerance limit

5.2.29 At PR99, we assumed that CCD and MNI expenditure should not be exactly equal but that they should be similar. We recognise that there may be good reasons for differences between them over the period we considered. For this reason, we adopted a tolerance limit below which we did not make an adjustment. We set this limit at 3% of turnover for 1997-98. This is equivalent to a 1% change in K. This is the accuracy level used as the definition of materiality in the business plan guidance. Companies believe that this limit should be increased. They are concerned that the 3% limit is not high enough to cover all of the difference that could be expected.

Q21: Is the 3% tolerance limit sufficient to account for all of the differences that could result from the issues highlighted in this section of the paper?

Q22: If not, what level of tolerance would be appropriate?

Inter-generational effects

5.2.30 Companies also argue that because we have reduced the depreciation charge, current customers are being subsidised by future generations. This is because depreciation charges (and hence price limits) are less in the current period than they would have been if we had not made our adjustment. Companies believe that they should recover, through the CCD charge, the loss of the economic value of the assets over the useful life of those assets. We agree that customers' charges should reflect the consumption of the assets but question the life over which companies propose these costs should be recovered. The application of a downward adjustment simply means that the depreciation charge is less each year and that the costs are recovered over a longer period. Companies continue to earn a return on the undepreciated value of the assets in the RCV. The amount of expenditure required to replace assets in any year

can be viewed as an indication of the reduction in value in the asset base and hence the amount which should be funded by customers.

Q23: Do you consider that our approach has resulted in an unacceptable intergenerational effect?

Impact of future efficiency

5.2.31 At PR99, the MNI projections that we compared with CCD reflected our assumptions about future efficiency. The CCD projections consider past expenditure and reflect past efficiencies. These are taken into account in the MEA valuation. They do not take any account of future efficiency. Companies are concerned that the depreciation adjustment was overstated because of this inconsistency. We agree that this is an area that we should address for PR04.

Q24: Will the comparison of MNI projections, before future efficiency adjustments are made, result in a fairer comparison?

Q25: Should we use MNI projections excluding our assumptions about general efficiency or should they exclude both general efficiency and the catch up target for the less efficient companies?

Technological improvement

5.2.32 Companies argue that improved technology is resulting in assets that have shorter lives and are consequently replaced more often. This is resulting in a higher depreciation charge in the short term giving a front end-loaded depreciation profile. Improved technology should lead to higher standards of services, lower overall costs, or a combination of both. Compared to other industries the water industry does not experience rapid technological change and consequently should not experience significant changes in asset mix.

Q26: What evidence could be provided to demonstrate a justifiable trend towards shorter life assets?

Allocation of expenditure to functional categories

5.2.33 We classify expenditure according to the purpose for which it is incurred. The functional categories we use are MNI expenditure, IRE, quality enhancement, supply demand balance and enhanced service levels. Inevitably there is a degree of overlap between these categories. For example, expenditure to meet new quality obligations may also result in the replacement or renewal of existing assets. We take account of the overlap between categories where possible; for example, for PR99 we set out clear guidance on the allocation of expenditure between quality enhancement and maintenance. Different classifications of expenditure

used by companies may explain some of the variance between CCD and MNI expenditure projections.

Q27: To what extent do you think that expenditure allocated to categories other than MNI expenditure results in the replacement and renewal of the asset base? Please give examples where possible.

6. Response to the consultation

- 6.1 We want to hear from all those with an interest in the issues raised in this paper. We would particularly welcome views from parties other than the industry specialists. Your views are invited by 26 April 2002 and should be sent to:

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The responses will be published by placing them in our library unless they are clearly marked confidential.

If you have any queries about the consultation please contact Tracey Anderson, Head of Regulatory Accounts and Business Affairs Team on 0121 625 1311 or by e-mail at tracey.anderson@ofwat.gsi.gov.uk

7. GLOSSARY

Asset Inventory Submission (Information Requirement H)	The Asset Inventory and System Performance Submission (August 1998) consisted of a report from the companies setting down details of the information systems that underpin the management of their assets; including an asset inventory summarising the companies' survey of their asset stock valuation, asset life categories and summary age profiles, condition and performance as at 31 March 1998; and a detailed explanation of changes in the proportions of asset value in the asset condition categories from the 1992-93 position reported in the Strategic Business Plan.
Business plan (2000-01 – 2004-05)	Business plans set out companies' overall strategies and the implications for price limits and average bills; their strategic objectives in terms of service performance outputs, quality and environmental outputs and other outputs; the activities necessary to meet these objectives, and the scope for improvements in efficiency.
Capital expenditure	Companies' spending on new construction, purchase of machinery etc.
Competition Commission (CC)	Considers merger references. CC is also the body companies can appeal to if they wish to contest Ofwat decisions in relation to determinations of price limits, licence amendments, accounting guidelines. Companies can also appeal to the CC on a decision made by the Director under the Competition Act 1998 in respect of agreements or conduct. Appeals can be made on the substance of decisions or on penalties imposed.
Cost of capital	The minimum return that providers of capital require to induce them to invest in or lend to a business, given its risks (also known as weighted average cost of capital).
Current cost depreciation	The depreciation charge on tangible fixed assets based upon the current values of those assets, less amortisation of deferred credits relating to grants and third party contributions.
Gross MEA value	The gross cost of replacing an existing asset with a technically up-to-date new asset with the same service capability.
Infrastructure renewals charge	An annual accounting provision for expenditure on the renewal of infrastructure (i.e. mainly underground) assets charged to the profit and loss account.

Net present value	The economic value of a project, at today's prices, calculated by netting off its discounted cash flow from revenues and costs over its full life.
Net MEA Value	The aggregate net book value of a company's fixed assets valued on a Modern Equivalent Asset (MEA) basis. This would be the cost to a new entrant of buying an asset with the same production capability (or life).
Periodic review	The process of setting water companies' maximum price limits. The maximum prices companies can charge are based on a formula of inflation (RPI) plus or minus K. K factors were set for each of the water companies by the Secretaries of State for ten years from 1989. In 1996 Ofwat announced it would review prices at the earliest opportunity after five years. The companies' licences were subsequently changed (Condition B, which came into force in 2000) so that reviews could take place every five years in future. The first PR took place after five years, and the price limits took effect from 1 April 1995. A second review was carried out in 1999, and set revised price limits from 1 April 2000.
Price limit	The amount by which a company can increase (or must decrease) its charges is controlled by the price limit formula $RPI \pm K + U$. K is a number determined by the Director every five years for each company, for each year, to reflect what it needs above inflation, in order to finance the provision of services to customers. RPI is expressed as the percentage increase in the Retail Price Index in the year to the November before the charging year. U is the amount of K not taken up in previous years.
RPI	Retail Price Index. See definition of price limit.
Regulatory capital value	The capital base used in setting price limits. It represents the initial market value (first 200 day average), including debt, plus subsequent net new capital expenditure, as assumed at the time of initial price setting and including new obligations imposed since 1989. The capital value has been calculated using Ofwat methodology (i.e. after current cost depreciation and infrastructure renewals accrual).
Return on capital	Calculated as a percentage and is the current operating profit for the year divided by the average RCV for the year.

Past publications discussing our approach to depreciation

MD letters

MD113 Current cost depreciation: consistency across companies December 1995

MD124 1999 Periodic review February 1997

1999 Periodic review publications

The proposed framework and approach to the 1999
Periodic review – A consultation paper June 1997

Setting price limits for water and sewerage services
- The framework and business planning process for the
1999 Periodic review February 1998

Financial Model Rule Book – A technical paper October 1998

Prospects for prices – A consultation paper on strategic
issues affecting future water bills October 1998

Draft determinations – Future water and sewerage charges
2000-05 July 1999

Final determinations – Future water and sewerage charges
2000-05 November 1999

The publications are available from our website or from our library.