Staff Paper 7

Capital maintenance

This staff paper has been produced by our office to assist stakeholders in responding to the Draft Determination. The material reflected in this staff paper has informed the preparation of the Commission's proposed conclusions. However, this staff paper does not form part of the Draft Determination. Accordingly, this staff paper should not be relied upon as expanding upon or replacing anything contained in the Draft Determination.

7.1 Background

In the current regulatory control period, Scottish Water spent around £500 million to £600 million a year on capital investment. This is one of the largest capital investment programmes in the UK. It comprises two main elements: 'capital maintenance' investment and 'capital enhancement' investment.

Capital maintenance is the investment required to maintain existing levels of service to customers, and to protect the environment, through replacing worn out plant and equipment at the end of its useful life. In the water industry, the physical assets that make up the water and wastewater networks can have very varied life-spans, from a few years for IT equipment to more than 100 years for sewers and other structures. Historically, capital maintenance represents around 40% to 50% of Scottish Water's overall investment programme. This is a ratio typical of the water and sewerage companies operating in England and Wales.

The remainder of the investment programme is termed 'capital enhancement'. This is investment associated with improvements in performance in terms of improved drinking water quality, environmental performance and customer service. A review of Scottish Water's capital enhancement programme is set out in Staff Paper 8.

This staff paper begins with a summary of Scottish Water's overall investment proposals to deliver the objectives set by the Scottish Government. This is followed by an assessment of the capital maintenance element of these proposals. The assessment was carried out in two stages: the first examined Scottish Water's detailed proposals, the second provided high level analysis of the likely level of capital maintenance investment required. The staff paper then sets out the Commission's conclusions on the level of capital maintenance to be allowed for in the next regulatory control period.

7.2 Scottish Water's view of the required capital investment

In its March 2009 business plan, Scottish Water identified a total of £2.55 billion of capital investment. This comprises (all in 2007-08 prices):

- £1,975 million to meet the Priority 1 objectives set by Ministers[1],
- £169 million to complete the unfinished elements of previous investment programmes,
- £74 million to begin work on delivering the next investment programme post 2014, and
- an additional £331 million of investment which has been identified to meet the Priority 2 objectives in their entirety – this has not been included in Scottish Water's base investment plan.

Scottish Water's proposals include an 'early start' programme involving expenditure prior to 1 April 2010 and an element of investment completion after March 2014. Scottish Water indicated that it sees this as necessary to provide continuity of investment planning and delivery across regulatory control periods.

The forecast investment requirement of £169 million for completion of outputs from previous investment periods includes undelivered outputs from both the 2002-06 period and the 2006-10 period.

Scottish Water's proposed base investment plan is split 45%/55% between capital maintenance and capital enhancement. The proposed investment on the key elements of the programme is set out in Table 7.1 below.

The remainder of this staff paper will focus on the capital maintenance investment associated with maintaining serviceability to customers. Staff Paper 8 examines Scottish Water's proposals in the other areas.

[1] Scottish Water has included in this total additional investment priorities of £16 million for reducing odour issues at Seafield waste water treatment works and £7 million for reducing inadequate water pressure, neither of which are expressly set out in the current draft objectives set out by the Scottish Government.

Table 7.1: Scottish Water's identified investment (post-efficiency)

	Base investment plan	'Priority 2' additions	Total
Maintaining serviceability (capital maintenance)	£928m	-	£928m
Environmental improvement	£445m	£80m	£525m
Drinking water quality & water resources	£388m	£166m	£554m
New development (to accommodate growth)	£177m	-	£177m
Other investment priorities (including the Flooding Bill)	£37m	£86m	£123m
Early start of work for the next investment period	£74m	-	£74m
Completion of output delivery from previous investment periods	£169m	-	£169m
Total investment identified (post-efficiency)	**£2,218m**	**£331m**	**£2,549m**

7.3 Scottish Water's view of the required capital maintenance investment for 2010-14

Scottish Water's proposed capital maintenance investment of £928 million (in 2007-08 prices) comprises £825 million of 'baseline' capital maintenance and £103 million of 'exceptional items'.

The assessed minimum level of capital maintenance is referred to as 'baseline' capital maintenance. It consists of investment in assets[2] which are planned or predicted to need renewal or replacement in the 2010-14 period. It will also include a provision to renew or replace those assets that fail unexpectedly – often termed 'reactive maintenance'.

Scottish Water's assessment of baseline capital maintenance for the 2010-14 period is split across five standard asset groups:

- water non-infrastructure (£92.1 million): above-ground water assets such as treatment works and reservoirs;
- water infrastructure (£246.9 million): this is primarily the underground network of water pipes;

[2] The term 'assets' is used here to describe the plant, equipment and components that make up the water and wastewater networks. This includes underground pipes and sewers, above-ground treatment works and pumping stations, reservoirs and dams and also items such as vehicles, IT equipment and buildings.

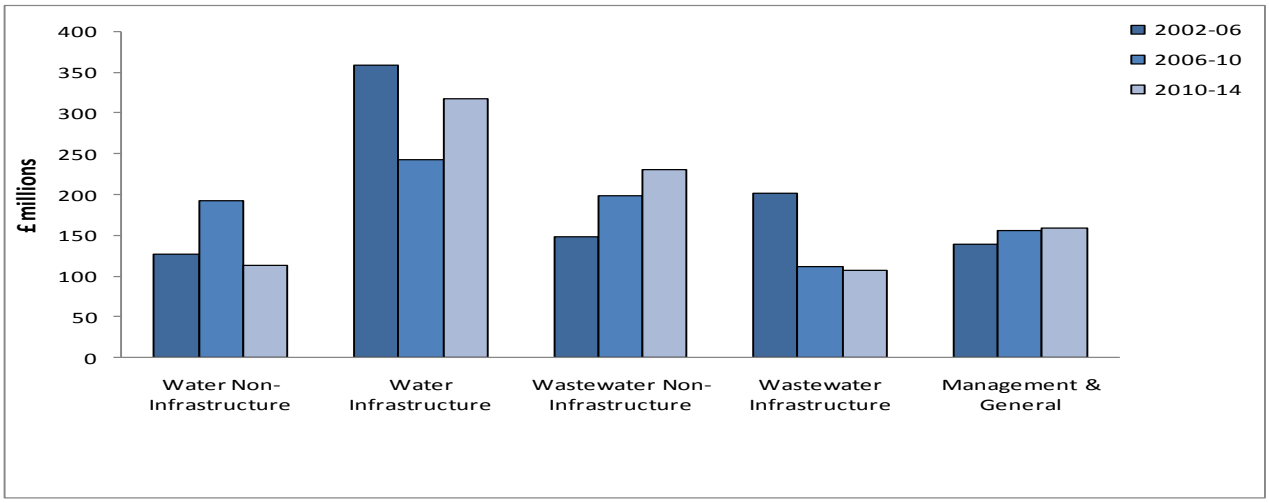
- wastewater non-infrastructure (£223.8 million): above-ground wastewater assets such as sewage treatment plants and pumping stations;
- wastewater infrastructure (£102.3 million): below ground wastewater assets such as sewers; and
- support services[3] (£159.5 million): non-operational plant and equipment such as vehicles, buildings and computers.

Scottish Water stated that this proposed level of capital maintenance was informed by an improved understanding of asset performance and took account of any overlap with work packages in the capital enhancement programme.

Scottish Water proposed additional investment of £103 million for 'exceptional items' that include leakage reduction, accelerated maintenance, improvements to the monitoring of water and wastewater networks and replacement of chlorine gas disinfection systems. The combination of baseline maintenance and exceptional items represents the totality of Scottish Water's capital maintenance proposal. There are no additional claims for 'special factors' in this programme area.

In broad terms, Scottish Water proposes to increase capital maintenance investment on its water infrastructure, wastewater non-infrastructure and support services assets and to reduce expenditure on its water non-infrastructure and wastewater infrastructure assets. Figure 7.1 shows capital maintenance expenditure proposed by Scottish Water by asset group for 2010-14 compared with actual expenditure in the two previous regulatory control periods.

Figure 7.1: Comparison of capital maintenance investment in previous periods by asset group



Scottish Water attributed the decrease in the proposed spend on water non-infrastructure to the 'accelerated' capital maintenance at water treatment works that was carried out in the current (2006-10) regulatory control period due to the significant investment on improvements in water quality.

[3] This is commonly referred to as 'Management & General'.

Scottish Water linked the increase in water infrastructure expenditure to the requirement to avoid deterioration in service associated with unplanned interruptions. Similarly, the increase in wastewater non-infrastructure investment was associated by Scottish Water with the requirement to improve performance at wastewater treatment works to achieve further improvements in service as measured by the overall performance assessment (OPA). Both wastewater infrastructure and support service ('management and general') expenditure are broadly consistent with previous years.

7.4 How Scottish Water's proposals were assessed

In establishing the approach to capital maintenance for 2010-14 the Commission again considered Ofwat's four stage approach which is linked to the UKWIR Common Framework for Capital Maintenance Planning. At the Strategic Review of Charges 2006-10, £15 million was allowed for Scottish Water to improve its information in this area. Although it has made good progress, the information is not sufficiently advanced to implement the common framework approach in this Strategic Review of Charges. It is still likely to take several years before Scottish Water has the necessary information (of sufficient quality and over a sufficient time period) to enable the Commission to use this approach.

Recognising these limitations, Scottish Water was asked to set out its detailed plan for capital maintenance. This comprises a 'bottom up' assessment of the investment scope and costs required for 2010-14 in each of the five areas covering both water and wastewater and infrastructure (broadly the underground assets) and non-infrastructure (above ground) and support services. Through the Reporter's assessment of this proposed programme of work, this Office has built up an understanding of the quality of information that substantiates Scottish Water's proposal. This is discussed in greater detail below.

The Office also developed four alternative, high-level or 'top-down' approaches which enable an independent assessment of the likely level of capital maintenance necessary for Scottish Water to maintain serviceability during 2010-14. The outcome of this high-level analysis is used to test the reasonableness of the detailed assessment. The four high-level approaches are as follows:

- Method 1 – Capital Maintenance Econometric Returns (CMER). In this approach a set of statistical methods are applied to the capital maintenance of companies operating in England and Wales to estimate the capital maintenance likely to be required in Scotland.

- Method 2 – Modern Equivalent Asset Value (MEAV). This approach uses information on the value of Scottish Water's physical asset base and from the England and Wales companies to establish the level of capital maintenance required to maintain this asset base.

- Method 3 – Serviceability. The serviceability approach establishes the level of capital maintenance investment in Scotland from historic levels of investment and the trends in the level of service to customers.

- Method 4 – Percentage Operational Expenditure (% of OPEX). This method estimates the level of capital maintenance for all companies by using information on the cost of operating the assets as a proxy.

The following sections describe the outcome of the assessment of Scottish Water's detailed 'bottom up' capital maintenance plan. The results from this assessment are then compared with the results from the four high-level approaches.

7.5 Assessment of Scottish Water's capital maintenance proposals

This section explains the scope of capital maintenance activities in each of the five standard asset groups and the broad rationale for any adjustments made to the level of capital maintenance proposed. This includes, where appropriate, consideration of any exceptional items proposed by Scottish Water. It is not possible, given that this is an overview of issues considered by the Commission, to provide full details of the careful consideration carried out by the Commission of Scottish Water's capital maintenance proposals. What follows is, therefore, a necessarily abbreviated summary.

Overall, the Reporter is generally satisfied with the way in which Scottish Water developed its capital maintenance proposals. He believes that Scottish Water's approach has correctly identified the renewal and replacement work necessary in the short to medium term. In some areas he has concerns about the use of 'average costs' which may over-inflate cost estimates. He also notes high 'on-costs'. Nonetheless, he believes that the scope challenges and downward cost moderation applied by senior managers provided, for the most part, a prudent and sufficiently prioritised capital maintenance investment plan for 2010-14.

The Reporter suggests the need for Scottish Water to continue to develop its asset intelligence such that future, forward-looking programmes are less reliant on judgement. This conclusion is partly based on the observation that a good proportion of Scottish Water's planned, baseline investment is not yet defined (it is not site or asset specific). The Reporter remains confident that even with this lack of definition Scottish Water will be able to spend its proposed allocation effectively.

Assessment of Scottish Water's proposals for water non-infrastructure

Scottish Water identified post-efficiency base maintenance investment of £92.1 million to maintain water treatment works, boreholes, service reservoirs and water pumping stations. It also proposed an additional £20.8 million as an 'exceptional item' to undertake accelerated maintenance and to replace chlorine gas

disinfection systems at water treatment works. The breakdown of the proposed investment by category is shown in Table 7.2.

Table 7.2: Scottish Water's proposed capital maintenance in water non-infrastructure assets, post-efficiency (2007-08 prices)

Water non-infrastructure capital maintenance	Base (£m)	Exceptional (£m)	Total (£m)
Water treatment works	52.5	19.4	71.9
Accelerated maintenance	nil	1.4	1.4
Boreholes	6.0	nil	6.0
Service reservoirs and secondary disinfection	15.6	nil	15.6
Water pumping stations	7.9	nil	7.9
Reactive maintenance	10.1	nil	10.1
TOTALS	**92.1**	**20.8**	**112.9**

The Reporter broadly supported Scottish Water's proposal in this area but highlighted some areas where the scope of work proposed seems excessive and costs appear high. In particular, the Reporter's comments on the approach to replacing Granular Activated Carbon (GAC) media and the unnecessary replacement of temporary plant were noted. The Commission believes that the same, rolling programme can be provided at lower cost. Investment in this area was therefore reduced by 20%.

Scottish Water reduced its requirement to replace membranes at 92 named sites to 76. Investment in this area was reduced by a proportional amount to reflect this.

The Commission broadly accepted Scottish Water's proposed investment for its 'exceptional items'. A new, internal company policy is driving Scottish Water to consider a different approach to disinfection at 34 water treatment works. The Commission recognises the importance of addressing Health & Safety risks to employees and supports this initiative. The full amount was therefore allowed for in the Draft Determination.

Accelerated maintenance is the early renewal and replacement of assets which is planned to coincide with capital enhancement investment. The aim is that by coordinating this investment Scottish Water can better assure the delivery of outputs funded under the capital enhancement programme. To support the delivery of the quality enhancement programmes Scottish Water proposed £1.4 million of accelerated maintenance at its water non-infrastructure assets. The Commission supports this and allowed for the full amount proposed.

Reactive maintenance is the replacement of assets which have failed in service, either unexpectedly or where there is no significant impact on customer service. Scottish Water's proposed investment in this area is based on historic spend and is understood to include some reduction to account for progressing to a more planned maintenance regime. We believe that there is scope for further reductions in reactive

maintenance as Scottish Water's asset intelligence improves. We have therefore decreased the allowance by 5%.

The allowed for capital maintenance investment at water non-infrastructure assets including exceptional items is assessed at £109.0 million, as shown in Table 7.3.

Table 7.3: Allowed for level of capital maintenance investment at water non-infrastructure assets, post-efficiency (2007-08 prices)

Water non-infrastructure capital maintenance	Allowed for investment 2010-14 (£m)	Change from Scottish Water's proposal (£m)
Water treatment works	68.5	-3.4
Accelerated maintenance	1.4	nil
Boreholes	6.0	nil
Service reservoirs and secondary disinfection	15.6	nil
Water pumping stations	7.9	nil
Reactive maintenance	9.6	-0.5
TOTALS	**109.0**	**-3.9**

Assessment of Scottish Water's proposals for water infrastructure

Scottish Water identified post-efficiency base maintenance investment of £246.9 million to rehabilitate and secure its critical water main assets, aqueducts, dams and impound reservoirs and to maintain key network models. The proposal also includes £70.9 million for 'exceptional items' to invest in better leakage management and to bring forward investment associated with the capital enhancement programme.

Table 7.4: Scottish Water's proposed capital maintenance in water infrastructure assets, post-efficiency (2007-08 prices)

Water infrastructure capital maintenance	Base (£m)	Exceptional (£m)	Total (£m)
Network interventions	143.7	4.3	148.0
PRV & DMA maintenance	20.5	nil	20.5
Accelerated maintenance	nil	39.4	39.4
Network model maintenance	5.5	Nil	5.5
Aqueducts	15.6	Nil	15.6
Leakage	nil	27.2	27.2
Dams & impounding reservoirs	23.2	Nil	23.2
Network investigations	8.6	Nil	8.6
Service relocations	8.2	Nil	8.2
Reactive maintenance	21.6	Nil	21.6
TOTALS	**246.9**	**70.9**	**317.8**

Over half of the proposed investment in this category is on 'network interventions'. Scottish Water proposed to rehabilitate 1,275km of critical water mains to manage compliance failures and maintain the number of properties on the low pressure register at a baseline level of 240.

The Commission supports the view that a sensible water mains rehabilitation rate is required to maintain customer service and ensure a smooth, manageable delivery profile period-to-period. It is encouraged by the efforts Scottish Water has made to target this investment through improved asset information. However, it is clear from the Reporter that weaknesses in the deterioration model used to inform the rehabilitation rate and cost uncertainties reduce confidence in the proposed level of investment. Given the shortcomings and the potential opportunities to reduce costs in this area the proposed investment on network interventions was reduced by 10%.

However, additional investment has been included for cleaning the network (termed 'flushing and swabbing'). This was removed from the capital enhancement programme as it is associated with maintaining the existing level of service to customers. This amounts to an additional allowance of £21.3 million (post-efficiency).

Other areas of challenge on water infrastructure were as follows:

- Scottish Water proposed an additional £4.3 million under 'exceptional items' to create around 1,000 network monitoring points on the network to signal changes in flow and pressure. The Commission understands Scottish Water's ambition to manage unplanned interruptions in supply better but is not persuaded by its rationale. Scottish Water's proposal was therefore reduced by 50%.

- Scottish Water proposed £20.5 million maintenance on its DMA (District Metered Area) and PRV (Pressure Reduction Valve) stock. The Commission was not persuaded by Scottish Water's arguments that wholesale logger replacement is necessary and is disappointed that DMA meter equipment appears to be prematurely failing. The Commission does not believe that customers should pay for poor specification and has reduced costs in this area. The Commission would encourage Scottish Water to identify and implement lower whole-life cost solutions going forward.

- Network models provide the foundation for understanding the hydraulic performance of the water network. However, there are opportunities for efficiencies in Scottish Water's approach and the proposal has therefore been reduced.

- Given the potential significance of the failure of raw water aqueducts, confirmed by the Reporter, the full £15.6 million proposed by Scottish Water was allowed for.

- All dams and impounding reservoirs with more than 25Ml capacity require regular, independent inspections. This generates a set of interventions considered necessary to maintain these assets adequately. From these studies Scottish Water proposed £23.2 million capital maintenance investment. Given the uncertainty in the estimates identified by the Reporter, the £9 million discretionary spend element was reduced by one half.

- For network investigations, an additional £1.5 million was added, transferred from the enhancement programme for study work associated with reductions in iron and manganese levels.

- The allowance for reactive maintenance was decreased to take account of the scope for further reductions to be realised as Scottish Water's asset intelligence improves.

The additional capital maintenance to support the understanding of leakage and its reduction is presented by Scottish Water as an exceptional item. It is assessed at £27.2 million and includes enhancements to the asset base, improved data capture and reporting systems. Scottish Water identified these needs following the outcome of its initial study on the economic level of leakage (ELL) in December 2008.

Given the uncertainty in the ELL estimate and the requirement placed upon Scottish Water to achieve its ELL the Commission broadly supports this work. There are, however, some adjustments. During 2006-10 Scottish Water was financed to better understand real water consumption (rather than estimating it) through the installation of per capita consumption monitors. Scottish Water has adopted an approach of small area monitoring, which comprises 100 strategically placed network water flow meters. One hundred and fourteen have been installed to allow for events such as outages. The Commission does not see the need for the wider campaign proposed

by Scottish Water and this has therefore been substituted with a study to investigate the potential benefit of individual household monitors.

Also, within the leakage exceptional item is £6.0 million proposed by Scottish Water for work in six water resource zones. The Commission believes that there is an opportunity for alternative approaches to reduce costs and has reduced this element of the proposal by £1.7 million. Overall, the amount that is allowed for to advance leakage reduction is £25.6 million.

The assessment of the allowed for capital maintenance investment at water infrastructure assets including exceptional items is £318.4 million, as shown in Table 7.5.

Table 7.5: Allowed for level of capital maintenance investment at water infrastructure assets, post-efficiency (2007-08 prices)

Water infrastructure capital maintenance	Allowed for investment 2010-14 (£m)	Change from Scottish Water's proposal (£m)
Network interventions	154.1	+6.1
PRV & DMA maintenance	17.4	-3.1
Accelerated maintenance	39.4	nil
Network model maintenance	4.4	-1.1
Aqueducts	15.6	nil
Leakage	25.6	-1.7
Dams & impounding reservoirs	23.2	nil
Network investigations	10.1	1.5
Service relocations	8.2	Nil
Reactive maintenance	20.5	-1.1
TOTALS	**318.4**	**0.6**

Assessment of Scottish Water's proposals for wastewater non-infrastructure

Scottish Water proposes base maintenance investment of £223.8 million on its wastewater non-infrastructure assets and a further £6.9 million associated with the accelerated maintenance linked to the quality enhancement programme.

The proposed investment by asset sub-group is listed in Table 7.6 below.

Table 7.6: Scottish Water's proposed capital maintenance in wastewater non-infrastructure assets, post-efficiency (2007-08 prices)

Wastewater non-infrastructure capital maintenance	Base (£m)	Exceptional (£m)	Total (£m)
Wastewater treatment	155.9	nil	155.9
Accelerated maintenance	nil	6.9	6.9
Sludge treatment	9.4	nil	9.4
Wastewater pumping stations	33.3	nil	33.3
Reactive maintenance	25.2	nil	25.2
TOTALS	**223.8**	**6.9**	**230.7**

The Reporter was generally satisfied with the way in which Scottish Water had developed its investment proposals for wastewater infrastructure and, in particular, the use of evidential information to substantiate and target capital maintenance.

However, for the wastewater treatment assets the Reporter identified concerns that the on-costs applied could distort cost estimates and may not be appropriate for capital maintenance. The Reporter also identified evidence of over-scoping arising from the consideration of longer-term investment needs at one site. The allowed for wastewater treatment works programme has therefore been reduced by 10%, or £15.6 million.

The progress that Scottish Water has made in developing forward looking capital maintenance investment plans based on better asset information was discussed at the start of this section. As noted by the Reporter, the approaches are immature and in places limited by deficient information. This appears to be particularly relevant in the case of pumping stations. A 10% decrease was therefore applied to the proposed capital investment of £33.3 million at pumping stations, as the Commission believes that there is scope to define and target need.

A reduction has also been applied to Scottish Water's reactive maintenance proposals within wastewater infrastructure, in line with the adjustment to water non-infrastructure.

The assessment of the allowed for capital maintenance investment at wastewater non-infrastructure assets including exceptional items is £210.5 million, as shown in Table 7.7.

Table 7.7: Allowed for level of capital maintenance investment at wastewater non-infrastructure assets, post-efficiency (2007-08 prices)

Wastewater non-infrastructure capital maintenance	Allowed for investment 2010-14 (£m)	Change from Scottish Water's proposal (£m)
Wastewater treatment	140.3	-15.6
Accelerated maintenance	6.9	nil
Sludge treatment	9.4	nil
Wastewater pumping stations	30.0	-3.3
Reactive maintenance	23.9	-1.3
TOTALS	**210.5**	**-20.2**

Assessment of Scottish Water's proposals for wastewater infrastructure

Scottish Water's proposal for wastewater infrastructure capital maintenance comprised £102.3 million of base maintenance to rehabilitate and secure its network of sewers and maintain its outfalls and system overflows. It also included maintenance of its sewer network models and investment so that there is no deterioration in the number of properties held on the flooding 'at risk' register. Scottish Water included an additional £4.7 million for accelerated maintenance to implement a wider campaign of sewer network monitoring.

A breakdown of the proposed investment in each area is shown in Table 7.8.

Table 7.8: Scottish Water's proposed capital maintenance in wastewater infrastructure assets, post-efficiency (2007-08 prices)

Wastewater infrastructure capital maintenance	Base (£m)	Exceptional (£m)	Total (£m)
Network model maintenance	5.7	nil	5.7
Sewer investigations	2.0	nil	2.0
Sewers and outfalls	57.5	nil	57.5
Combined sewer overflows	2.7	4.7	7.4
Internal flooding register	15.2	nil	15.2
Reactive maintenance	19.2	nil	19.2
TOTALS	**102.3**	**4.7**	**107.0**

The Commission recognises the importance of hydraulic modelling of the wastewater network properly to inform investment decisions and allowed for the full amount for network modelling and the associated £2.0 million for sewer investigations. It does, however, expect infiltration (water that escapes into the sewer system from the

ground or surface and reduces sewer capacity) to be properly accounted for in these models going forward, such that its economic removal can be considered along with conventional intervention options.

Under the sewers and outfalls category, the Commission believes that there is scope to understand the origins of flooding and pollution events and to target investment wisely. An element of the capital maintenance proposed in this area was therefore reduced by £2.4 million.

The Commission was also not wholly convinced by Scottish Water's proposals to use combined sewer overflow (CSO) monitors to help identify blockages in the system. It therefore reduced the CSO 'exceptional item' proposed by £1.2 million, to reflect a more considered monitoring campaign. The Commission requires a pilot study, financed from the amount allowed for, to understand the full extent of system development needed and to provide a comprehensive cost-benefit of the integrated network management approach proposed.

With regard to sewer flooding the Commission notes Scottish Water's ambition to maintain the number of properties on the sewer internal flooding 'at risk' register at 341. It noted the unreliability, raised by the Reporter, of using historic information to predict the number of properties that may emerge during the 2010-14 period but is reassured that the scope accords with that experienced in England and Wales. The Commission was concerned about the high average cost per property to provide permanent solutions.

Along with customers and Waterwatch Scotland, the Commission believes that sewer flooding is a priority area. There was therefore no adjustment to the proposed investment in this area. The Commission would encourage Scottish Water to consider how it can mitigate against the risk of internal flooding to those customers who have been on the 'at risk register' the longest.

Scottish Water's reactive maintenance proposals were reduced by 5% for the reasons set out above.

The assessment of the allowed for capital maintenance investment at wastewater infrastructure assets including exceptional items is £102.5 million, as shown in Table 7.9.

Table 7.9: Allowed for level of capital maintenance investment at wastewater infrastructure assets, post-efficiency (2007-08 prices)

Wastewater infrastructure capital maintenance	Allowed for investment 2010-14 (£m)	Change from Scottish Water's proposal (£m)
Network model maintenance	5.7	nil
Sewer investigations	2.0	nil
Sewers and outfalls	55.1	-2.4
Combined sewer overflows	6.2	-1.2
Internal flooding register	15.2	nil
Reactive maintenance	18.2	-1.0
TOTALS	**102.5**	**-4.5**

Assessment of Scottish Water's proposals for support services

The support services assets that are essential to the effective day-to-day management of Scottish Water's business also need maintaining. This includes vehicles, information systems, offices etc. Scottish Water proposed investment of £159.5 million (post-efficiency) in this area. No 'exceptional items' were presented. The breakdown of the proposed investment by category is shown in Table 7.10.

Table 7.10: Scottish Water's proposed capital maintenance in its support services assets, post-efficiency (2007-08 prices)

Support services capital maintenance	Base (£m)	Exceptional (£m)	Total (£m)
Information technology	53.2	nil	53.2
Information improvement	27.5	nil	27.5
Logistics	23.2	nil	23.2
Property	18.7	nil	18.7
Meters and ironwork	12.8	nil	12.8
Telemetry	17.5	nil	17.5
Scientific	1.7	nil	1.7
Business planning and long-term strategy	4.9	nil	4.9
TOTALS	**159.5**	**nil**	**159.5**

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Scottish Water proposed £53.2 million capital maintenance investment on its information technology (IT) systems. The Reporter identified that the cost to upgrade Scottish Water's core applications had not been fully market tested or assembled in such a way as to optimise potential efficiencies. He accepted that some form of contingency is appropriate for the overall IT programme but that this was unjustified

for individual projects. The Reporter provides similar observations to the information improvement programme in which Scottish Water proposed investment of £27.5 million. Taking these points into account both programmes were decreased by 20%.

Investment in logistics primarily allows for the replacement of vehicles that have come to the end of their serviceable lives. Generally the Reporter believes that the replacement costs proposed were reasonable. A reduction to this area of £0.3 million was applied as the Reporter identified some scope for lower vehicle telecommunications costs.

Scottish Water proposes £17.5 million capital maintenance investment on its telemetry (asset monitoring) equipment. The Commission noted the Reporter's view regarding the potential scope for further efficiency, and reduced the amount Scottish Water proposes by 20%. The Commission believes that this is sufficient to maintain Scottish Water's telemetry equipment for the period 2010-14.

The assessment of the allowed for capital maintenance investment in support services is £139.6 million, as shown in Table 7.11.

Table 7.11: Allowed for level of capital maintenance investment for support services assets, post-efficiency (2007-08 prices)

Support services capital maintenance	**Allowed for investment 2010-14 (£m)**	**Change from Scottish Water's proposal (£m)**
Information technology	42.6	-10.6
Information improvement	22.0	-5.5
Logistics	23.0	-0.3
Property	18.7	nil
Meters and ironwork	12.8	nil
Telemetry	14.0	-3.5
Scientific	1.7	nil
Business planning and long-term strategy	4.9	nil
TOTALS	**139.6**	**-19.9**

7.6 Assessment of Scottish Water's proposals: overview

The detailed assessment of Scottish Water's proposed capital maintenance investment within each asset group indicated that Scottish Water can maintain serviceability for customers through capital maintenance investment of £880 million over four years (£220 million per annum), including exceptional items.

This assessment was based on Scottish Water's proposed post-efficiency expenditure in each area. The Reporter confirmed that Scottish Water applied a robust efficiency challenge to its assessment of capital maintenance. The Commission has not increased the efficiency challenge further for this Draft Determination. It will review the efficiency challenge applicable to capital maintenance for the Final Determination, when the impact of the England and Wales companies' final business plan submissions on the 'cost base'[4] assessment of Scottish Water's procurement efficiency is available.

Table 7.12: Summary of the allowed for level of capital maintenance investment, post-efficiency (2007-08 prices)

SUMMARY Capital maintenance	Scottish Water's proposal 2010-14 (£m)	Allowed for investment 2010-14 (£m)	Change from Scottish Water's proposal (£m)
Water non-infrastructure	112.9	109.0	-3.9
Water infrastructure	317.8	318.4	+0.6
Wastewater non-infrastructure	230.7	210.5	-20.2
Wastewater infrastructure	107.0	102.5	-4.5
Support services	159.5	139.6	-19.9
TOTALS	**927.9**	**880.0**	**-47.9**

7.7 Comparison with the outcome of the 'high level' assessment of capital maintenance requirements

In this section, the detailed assessment of Scottish Water's proposals is compared with the indicative levels of capital maintenance determined by the four alternative high-level approaches. For each approach, year on year fluctuations in capital maintenance expenditure are accounted for by benchmarking expenditure over many years.

The provision of water and wastewater services in Scotland is very similar to that in England and Wales, with three important exceptions. Firstly, Scottish Water separated its non-household retail business from its regulated core business prior to the commencement of the competitive market in April 2008. The non-household retail business has been included in the comparisons with England and Wales, with an adjustment then being made to reflect the separation of non-household retail activities.

[4] The 'cost base' methodology is explained in more detail in Staff Paper 8. It provides a measure of relative efficiency based on submission of standard costs by companies.

Secondly, in Scotland around half of wastewater is treated and disposed through public private partnership (PPP) agreements. The cost of maintaining assets on the PPP sites is included in the PPP service fees, which is an annual operating cost. PPP assets are therefore excluded from the comparisons.

Finally, due to differences in legislation, Scottish Water is responsible for maintaining all sewer laterals, whereas the companies in England and Wales are only responsible for maintaining certain sewer laterals. Sewer laterals are therefore excluded from the comparisons, although an adjustment is made for the extra cost of maintaining sewer laterals in Scotland. These adjustments ensure that comparisons are made on a like for like basis.

In its second draft business plan, Scottish Water did not claim that capital maintenance costs in Scotland are affected by Scotland's topography or demographics. The Commission agrees that these particular factors in Scotland do not result in Scottish Water incurring capital maintenance expenditure in excess of the companies in England and Wales. It did not make an adjustment to the assessment of capital maintenance expenditure for these factors.

A summary of the analysis using the four high-level methods is presented below.

Econometric modelling approach

This approach uses a suite of nine econometric models that were initially published by Ofwat in 1998 and first used in the 1999 price review. Each econometric model accounts for the relationship between capital maintenance expenditure and factors that may drive costs. These factors must have a clear impact on costs, although they must be beyond the discretionary control of the management of the company. By recognising the impact of these factors, the models can predict, for each company, the level of capital maintenance expenditure that would be expected given its geography, assets and customer base alone. The predicted expenditure is then compared to actual costs and the extent to which it is higher or lower provides an assessment of capital maintenance efficiency.

Ofwat previously indicated that it does not plan to use the econometric models to estimate the level of capital maintenance expenditure over the 'PR09' 2010-15 period. Nevertheless, Ofwat has collected and published the 2007-08 capital maintenance econometric return. Similar information was provided by Scottish Water in its second draft business plan. The Commission was able to use this information to recreate the 2006-07 published econometric models[5]. For each model, average annual expenditure from 2003-04 to 2007-08 was used. The value of the factors in 2002-03 was used to make sure that the factors are independent of decisions made during the period being modelled. Ofwat's capital maintenance econometrics were adapted to take account of the characteristics of Scottish Water's assets.

[5] 'Relative efficiency assessment 2006-07 – supporting information', 12 December 2007.

The efficiency gap was estimated as the distance between Scottish Water and the upper quartile performing companies: the average of the second and third performing company for both the water and wastewater service. However, the Commission's approach also considers the scope to achieve the level of procurement efficiency of upper quartile performing companies in England and Wales. The efficiency challenge is therefore derived by using half of the efficiency gap from the econometric models and half from the cost base. Table 7.13 summarises the assessed assessment efficiency gap.

Table 7.13: The proposed efficiency challenge

	Efficiency gap
Ofwat econometric models extended to Scotland	23%
Upper quartile cost base challenge	18%
Efficiency challenge	21%

This efficiency challenge was applied to Scottish Water's historic capital maintenance baseline on a 'straight line' glide path closing the full efficiency gap by 2013-14. The Commission considered that an additional allowance for exceptional items of capital maintenance expenditure would be inappropriate. Scottish Water's historic exceptional expenditure was included in its baseline, together with the implicit allowance from the econometric models.

Table 7.14 summarises the assessment of capital maintenance expenditure using the Ofwat econometric models.

Table 7.14: Assessed level of capital maintenance expenditure: econometric approach

	Capital maintenance expenditure (2010-14)
Ofwat econometric models adapted to take account of Scottish Water's assets	£861m

Modern Equivalent Asset Value (MEAV) approach

The MEAV is what it would cost to replace an old asset with a technically up to date new asset with the same service capability, allowing for any difference both in the quality of output and in operating costs. Given that it is a measure of the value of the assets in place at a given point in time, it can be used to inform an efficient level of capital maintenance expenditure in the following period.

Using this approach, capital maintenance expenditure was calculated as a percentage of gross MEAV for the companies in England and Wales, then applied to Scottish Water's gross MEAV. The gross MEAV of the companies in England and Wales in 1997-98 and 2002-03 was used to scale capital maintenance expenditure from 2000-01 to 2004-05 and 2005-06 to 2007-08 respectively. The capital maintenance percentage of gross MEAV was then applied to Scottish Water's gross

MEAV in 2007-08. This provided an estimate of the expenditure that Scottish Water would require if it performed in line with each company.

From these estimates it was possible to derive an upper quartile benchmark. Given the uncertainty underlying Scottish Water's gross MEAV estimate, two separate assessments were made. The first assessment was to align Scottish Water's infrastructure gross MEAV with the companies in England and Wales. The second assessment applied a cost base challenge to Scottish Water's MEAV estimate to reflect the underlying procurement inefficiency in 2007-08. Table 7.15 summarises the assessment of capital maintenance expenditure using the MEAV approach.

Table 7.15: Assessed level of capital maintenance expenditure: MEAV approach

	Capital maintenance expenditure (2010-14)
Using Scottish Water's gross MEAV (applying cost base challenge)	£817m
Using Scottish Water's gross MEAV (adjustment to align with England and Wales)	£847m

Serviceability approach

This approach considers the level of capital maintenance expenditure necessary to deliver stable serviceability over the 2010-14 period by only using information from Scotland. Historic information about the serviceability of Scottish Water's assets is limited. From the information available since Scottish Water's formation in 2002, the Commission considers that there is no evidence that recent levels of capital maintenance investment have been insufficient to maintain serviceability.

This would suggest that similar levels of capital maintenance expenditure would be sufficient to maintain stable serviceability going forward. A cost base challenge is then applied to Scottish Water's historic capital maintenance baseline consistent with delivering upper quartile performance based on company performance in 2007-08. The assessment includes expenditure on exceptional items.

Table 7.16 summarises the assessment of the capital maintenance expenditure that will allow Scottish Water to maintain stable serviceability.

Table 7.16: Assessed level of capital maintenance expenditure: serviceability approach

	Capital maintenance expenditure (2010-14)
Serviceability	£874m

Operating cost approach

Capital maintenance expenditure was also modelled in relation to the cost of operating these assets. Operating costs are generally easier to assess and benchmark than capital maintenance expenditure. Capital maintenance expenditure was assessed as a proportion of operating expenditure for each of the companies in

England and Wales for both the water and wastewater service over 1999-00 to 2007-08. This was then calculated separately for both the water and wastewater service.

Each company's capital maintenance proportion of operating expenditure was then applied to Scottish Water's operating costs in 2007-08 for both the water and wastewater service. This approach was used solely for indicative purposes given that it is sensitive to differences in capitalisation policies between companies. Table 7.17 summarises the assessment of capital maintenance using the operating cost approach.

Table 7.17: Assessed level of capital maintenance expenditure : operating cost approach

	Capital maintenance expenditure (2010-14)
Modelling with operating costs	£799m

Overview of high-level approaches

A summary of the outcome from the four high-level approaches is contained in Table 7.18.

Table 7.18: Outcome of assessed level of capital maintenance from high-level analysis

Method	Econometric modelling	MEAV approach	Serviceability approach	Operating costs
Estimated four-year capital maintenance requirement (£m)	£861m	£817m/£847m	£874m	£799m
Equivalent per annum requirement	£215m	£204m/£212m	£219m	£200m
Confidence	High	High	High	Low

The operating cost approach was excluded on the basis that there is least confidence in the accuracy of the outcome. The remaining assessments provided a range from £817 million to £874 million: equivalent to £204 million to £219 million per annum. This shows a close correlation (within a range of 92% to 99.5%) to our 'bottom up' assessment of Scottish Water's proposals of £880 million, or £220 million per annum.

The Commission concluded that the allowed for level of capital maintenance of £220 million per annum (post-efficiency) is sufficient for Scottish Water to maintain levels of service at the baseline level in 2009-10.

7.8 Summary

Capital maintenance is an essential component of Scottish Water's investment programme. It is a rolling programme of asset renewal and replacement work which is fundamental to preserving levels of service to customers and to protecting the environment. The Commission's role is to ensure that the Scottish Government's objectives to maintain these levels of service are financed at the lowest reasonable overall cost to customers.

Scottish Water suggested a level of capital maintenance investment of £928 million for the 2010-14 period, including additional exceptional items. Scottish Water's proposal has been assessed in detail. The Commission proposes an allowance of £880 million over four years, or £220 million per annum. Further high level analysis confirms a range within 92% to 99.5% of this proposed allowance.

For the proposed extension of the regulatory period to five years, a further £220 million of capital maintenance was assumed for the fifth year.