

APPENDIX 1.1
(referred to in paragraph 1.7)

Bodies submitting evidence

Association of District Councils
Borough Engineers' Society
Central Electricity Generating Board
Co-operative Union Ltd Parliamentary Committee
Eastbourne and District Chamber of Commerce
East Sussex County Council
Fareham Chamber of Commerce
Felpham Parish Council
Gooch & Wagstaff
Hampshire County Council
Maidstone Chamber of Commerce
Plessey Radar Limited
The Concrete Pipe Association
The House-Builders Federation
The National Farmers' Union
The Water Companies' Association
Water Industry Central Manpower Unit
Water Research Centre
West Sussex County Council

APPENDIX 3.1

(referred to in paragraph 3.83)

Conclusions on formal planning in specific companies

Formal planning: Eastbourne

1. Although the formal planning arrangements in Eastbourne were comparatively well-developed, the plan document itself could have been better laid out, with separate sections for standards, policy, and management targets. Level of service objectives and cost reduction objectives should also be dealt with separately. The absence of a quantified and specific overall cost reduction target for the company is a deficiency, as is the absence of a statement of present performance against level of service standards. The document should give clear plans for achievement in each case.

Formal planning: Folkestone

2. Given the small size of Folkestone we did not expect elaborate planning arrangements. We were particularly impressed by the way in which the planning of physical activities for the forthcoming year had been integrated into the annual budgeting process. However, we felt that the plan document itself did not do the company justice. We suggest there should be specific standards for each aspect of service; a statement of the company's current performance against each of these standards, together with a medium-term target in each case for achievements against the standard; a specific medium-term cost reduction target; and the setting of more departmental targets (comparable to the one for waste reduction).

Formal planning: Mid Kent

3. Mid Kent has put a great deal of effort into analysing its present situation and possible options for the future, and into setting up a formal planning procedure. It is too early to say whether this endeavour will be translated into action to achieve improved standards of service and lower costs for the company's customers. We hope that the planning process which it is intended to install will provide the necessary link between the planning of physical activities and the setting of annual budgets, as well as providing the continuity for medium-term planning which we see as being necessary for all aspects of the company's activities.

Formal planning: Mid-Sussex

4. We support the board's conclusion that a single planning document should be prepared to co-ordinate the various medium-term plans which are developed independently at present.

Formal planning: Portsmouth

5. While we do not think that Portsmouth necessarily needs to incorporate a full formal planning process into its procedures, it should set itself objectives and targets as recommended in paragraph 3.78. There should also be a closer integration of the planning of physical activities with budgets.

Formal planning: West Kent

6. The company has used its plan document as a way of laying out clearly its targets of service but it has not set out the present levels of service achieved against those targets or any medium-term plan for dealing with shortfalls in achievement. It has laid out no medium-term cost reduction target or plan. Only in the section under new technology are there any specific targets for managerial achievement.

APPENDIX 5.1

(referred to in paragraph 5.5)

A note on water resources by the Southern Water Authority

1. The Water Act 1973 transferred to the regional water authorities the functions carried out by the former river authorities, and imposed a duty on each authority to take such action as it considered necessary for the purpose of conserving, redistributing or otherwise augmenting water resources in its region.

2. This duty extends over the entire region of the Authority and is in addition to the responsibilities which SWA shares with the six statutory companies for the direct supply of water to consumers. Approximately half the region is supplied with water by SWA and half by the companies.

3. The water resources account is charged with the annual financing charges and working expenses incurred to the point of abstraction of raw water. Sources of raw water are defined as those which enable SWA to increase the natural resources of the region. They include river regulating and impounding reservoirs; investigatory and observation boreholes and springs used to augment the overall yield of the region.

4. Whilst the costs associated with SWA's own impounding reservoirs are shown in the water resources account these costs, which in 1984-85 were £1.8 million, are recharged to SWA's own water supply account through special abstraction charges (using a special weighting factor) in order to ensure that water abstractors at large, and particularly the water companies, do not finance the reservoirs constructed principally for SWA water supply purposes.

5. The costs incurred in providing and operating abstraction points from which raw water is taken for distribution to SWA's own consumers are charged direct to the water supply account. Also where groundwater is abstracted directly for SWA's own supply purposes, the total cost of the borehole or spring and of the conveyance of the raw water to a treatment works is charged to water supply.

6. An analysis of water resources expenditure for 1984-85 is set out overleaf.

7. It will be noted that the raw water reservoir costs include almost the entire costs which relate to surface water sources and all pumping costs, and related overhead expenditure. The basic water resource costs consequently are principally in respect of the hydrometric and water quality work in monitoring raw water plus associated overheads. These costs are incurred by divisional and Headquarters hydrologists and hydrogeologists and their hydrometric

assistants, but also incorporate a proportion of the divisional laboratory operating costs relating to raw water monitoring activities.

Water resources: SWA's service revenue account for the year ended 31 March 1985

	<i>Raw water reservoir related</i>		<i>£'000 Basic water resource costs</i>
<i>Income</i>	<i>Total</i>	<i>1,754*</i>	<i>2,770†</i>
<i>Income</i>	4,524	1,754*	2,770†
<i>Expenditure</i>			
<i>Sources of raw water:</i>			
Surface water	139	131	8
Ground water	6	—	6
<i>Transfer of raw water:</i>			
Pumping	103	103	—
<i>Monitoring of raw water:</i>			
Hydrometry	249	—	249
Water quality	56	—	56
Rates and water authority charges	110	110	—
Research and development	6	—	6
Sub-total operating costs	669	344	325
Technical services control; policy management and admin; and proportion of WRc, WAA contributions	1,060	126	934
Current cost depreciation	1,390	632	758
Total	3,119	1,102	2,017
Current cost operating profit	1,405	652	763
Net asset value 1984-85	64,442	37,485	26,958
Rate of return	2.18%	1.74%	2.79%

Source: SWA.

* Raw water reservoir related—all the income relating to resource related expenditure (the water resource costs) are recovered from SWA's own water supply account.

† Basic water resources—the basic water resource costs are recovered from all water abstractors in their abstraction charges as follows:

SWA	1,216
Water companies	1,117
Other abstractors	437
	<u>£2,770</u>

APPENDIX 5.2
(referred to in paragraph 5.29)

Operating and other costs

TABLE 1 Eastbourne: operating and other costs at 1984-85 prices

	<i>£ million</i>					<i>1984-85 as a percentage of 1980-81</i>
	<i>1980-81</i>	<i>1981-82</i>	<i>1982-83</i>	<i>1983-84</i>	<i>1984-85</i>	
Total income	6.1	6.1	6.1	6.1	5.9	97
Employee costs	2.2	2.3	2.3	2.3	2.2	
Power	0.5	0.6	0.6	0.6	0.6	
Chemicals	0.2	0.2	0.3	0.3	0.2	
Other costs	1.4	1.3	1.2	1.2	1.3	
Operating expenditure before depreciation and equalisation levy	4.3	4.4	4.4	4.4	4.3	100
Depreciation	0.4	0.4	0.4	0.4	0.4	
Equalisation levy	—	—	—	—	—	
Operating expenditure after depreciation and equalisation levy	4.7	4.8	4.8	4.8	4.7	100
Financial expenditure*	1.3	1.3	1.2	1.2	1.2	
Contingency account transfers	—	—	—	—	—	
Mainstream corp tax	—	—	0.1	0.1	0.0	
Other items	0.1	0.0	—	—	0.0	
Total expenditure account costs	6.1	6.1	6.1	6.1	5.9	97
Surplus/(deficit)	0.0	0.0	0.0	0.0	0.0	

Source: Eastbourne.

* Financial expenditure is mainly dividend and interest payments and advance corporation tax.

Comment by Eastbourne

The quantity of water put into supply increased in each of the years under review and by 15 per cent over the five-year period. The chalk sources which yield raw water of good quality with low treatment costs had been fully exploited at the beginning of the period. Therefore, the additional volume of water had to be met from other, mainly surface, sources with much higher treatment costs. The cost of power and chemicals and wages and salaries per employee all rose faster than the Retail Price Index. Despite this and the increase in the volume of water supplied the company's operating expenditure in real terms remained constant over the period. This result was achieved by a reduction in manpower from 208 to 185 and other savings.

TABLE 2 Folkestone: operating and other costs at 1984-85 prices

	<i>£ million</i>					<i>1984-85 as a percentage of 1980-81</i>
	<i>1980-81</i>	<i>1981-82</i>	<i>1982-83</i>	<i>1983-84</i>	<i>1984-85</i>	
Total income	3.5	3.6	3.5	3.6	3.7	106
Employee costs	1.3	1.2	1.3	1.3	1.3	
Power	0.3	0.3	0.3	0.3	0.3	
Chemicals	0.0	0.0	0.0	0.0	0.0	
Other costs	1.0	1.1	1.1	1.0	1.1	
Operating expenditure before depreciation and equalisation levy	2.6	2.6	2.7	2.6	2.7	104
Depreciation	0.2	0.2	0.2	0.2	0.2	
Equalisation levy	—	—	—	—	—	
Operating expenditure after depreciation and equalisation levy	2.8	2.8	2.9	2.8	2.9	104
Financial expenditure*	0.6	0.7	0.6	0.5	0.6	
Contingency account transfers	—	0.0	0.0	0.1	0.1	
Mainstream corp tax	—	—	—	0.0	0.1	
Other items	—	—	—	—	—	
Total expenditure account costs	3.4	3.5	3.5	3.4	3.7	109
Surplus/(deficit)	0.1	0.1	0.0	0.2	0.0	

Source: Folkestone.

* Financial expenditure is mainly dividend and interest payments and advance corporation tax.

Comment by Folkestone

Total income in constant prices increased by £0.2 million from 1980-81 to 1984-85. To a degree this reflects the growth in properties and metered supplies, as generally tariff rates were held below the rate of inflation during the period. During the period the number of employees fell from 144 in 1980 to 124 in 1984 but this arose mainly from a decrease in capital account activity by the company's own labour force and the employee costs on the expenditure account have remained constant. New supplies continued to rise by about 1 per cent per annum and together with increasing lengths of mains resulted in increased manpower needs. Improved utilisation of labour resources enabled the company to reduce labour effort in other areas to meet this need. The company was able to negotiate improved power tariffs over the period and coupled with efforts to pump water at the most economical times Folkestone was able to pump increased quantities of water without increasing costs. Although the level of fixed asset expenditure increased by more than 26 per cent during the period, financing costs remained constant in real terms. The reduction in interest rates and self-financing achieved by appropriations to reserve accounts have both contributed to this.

TABLE 3 Mid Kent: operating and other costs at 1984-85 prices

	£ million					1984-85 as a percentage of 1980-81
	1980-81	1981-82	1982-83	1983-84	1984-85	
Total income	11.9	12.8	13.5	13.7	13.8	116
Employee costs	4.1	4.6	4.6	4.8	4.8	
Power	1.2	1.2	1.3	1.3	1.2	
Chemicals	0.0	0.1	0.1	0.1	0.1	
Other costs	3.2	2.9	3.0	3.0	3.1	
Operating expenditure before depreciation and equalisation levy	8.5	8.8	9.0	9.2	9.2	108
Depreciation	0.7	0.8	0.7	0.8	0.7	
Equalisation levy	—	—	—	—	—	
Operating expenditure after depreciation and equalisation levy	9.2	9.6	9.7	10.0	9.9	108
Financial expenditure*	2.8	2.9	2.8	2.9	3.0	
Contingency account transfers	0.1	0.1	0.1	0.1	0.1	
Mainstream corp tax	0.0	0.1	0.4	0.4	0.3	
Other items	0.2	0.0	0.0	0.3	0.3	
Total expenditure account costs	12.3	12.7	13.0	13.7	13.6	111
Surplus/(deficit)	(0.4)	0.1	0.5	0.0	0.2	

Source: Mid Kent.

* Financial expenditure is mainly dividend and interest payments and advance corporation tax.

Comment by Mid Kent

Over the five-year period the company's operating expenditure increased by approximately 8 per cent in real terms mainly owing to increased employee costs. During that time the volume of water put into supply increased by 13 per cent. The increase in employee costs between the years 1980-81 and 1981-82 arose largely from the phased introduction of an approved water industry productivity payment scheme covering all manual operatives which met a commitment which formed part of the 1977 wages settlement. This resulted in an increase in output especially by distribution operatives and the period mainlaying contract was not renewed. Bonus payments to staff under a company productivity payment scheme which had been in operation since 1969 were also enhanced. During this period the company became liable for mainstream corporation tax. In 1983-84 and 1984-85 voluntary lump sum payments were made in order to reduce the actuarial deficit on the Water Companies Association's additional pension fund. In 1984-85 the company decided to write off all outstanding stock discounts and issue expenses which it had previously been writing off over the life of the stock. The voluntary lump sum payments and stock discount and issue expenses were equivalent to over 5 per cent of total costs in 1984-85.

TABLE 4 Mid-Sussex: operating and other costs at 1984-85 prices

	<i>£ million</i>					<i>1984-85 as a percentage of 1980-81</i>
	<i>1980-81</i>	<i>1981-82</i>	<i>1982-83</i>	<i>1983-84*</i>	<i>1984-85</i>	
Total income	6.7	6.7	7.1	7.2	7.1	106
Employee costs	1.6	1.6	1.7	1.8	1.7	
Power	0.6	0.7	0.7	0.7	0.7	
Chemicals	0.2	0.2	0.3	0.2	0.2	
Other costs	1.5	1.6	1.3	1.4	1.7	
Operating expenditure before depreciation and equalisation levy	3.9	4.1	4.0	4.1	4.3	110
Depreciation	—	0.3	0.4	0.4	0.5	
Equalisation levy	—	—	—	—	—	
Operating expenditure after depreciation and equalisation levy	3.9	4.4	4.4	4.5	4.8	123
Financial expenditure†	2.5	2.4	2.2	2.1	2.0	
Contingency account transfers	0.3	—	0.3	0.3	0.3	
Mainstream corp tax	—	—	—	—	—	
Other items	—	—	—	—	—	
Total expenditure account costs	6.7	6.8	6.9	6.9	7.1	106
Surplus/(deficit)	(0.0)	(0.1)	0.2	0.3	0.0	

Source: Mid-Sussex.

* These figures have been pro-rated to 12 months from an 18-month accounting period.

† Financial expenditure is mainly dividend and interest payments and advance corporation tax.

Comment by Mid-Sussex

The company carried out a reorganisation of its operations prior to 1980 with the closure of divisional offices and other economies in its operations. The company's apparent high cost trends during the five-year period up to 1984-85 were partly caused by exceptional factors. In 1980-81 the company did not depreciate all its assets and received a final receipt from central Government's now defunct water rate equalisation scheme, which accounts for an 8 per cent increase in costs in subsequent years and 15 per cent of charges. Other non-recurring factors in 1984-85 increased costs by 3 per cent. During 1984-85 the cost of conversion and purchase of software for the new billing system was charged to central and administration costs. In 1960 the company inherited a large number of small works supplying self-contained communities. In the mid-1970s the company built the Ardingly Reservoir, Barcambe No 2 works, and laid a system of trunk mains at a cost of £9 million which is expected to provide enough water for the next 20 years. About 75 per cent of the water put into supply requires more expensive treatment than chalk water. During the five-year period the company decided to invest £0.25 million per annum in mains relining to reduce discolouration and improve quality of water; 40 per cent of the expenditure is charged to revenue. It also increased the standard of treatment at the Barcambe and other works, and mechanical and electrical staff for the maintenance of more complex plant.

TABLE 5 Portsmouth: operating and other costs at 1984-85 prices

	<i>£ million</i>					<i>1984-85 as a percentage of 1980-81</i>
	<i>1980-81</i>	<i>1981-82</i>	<i>1982-83</i>	<i>1983-84</i>	<i>1984-85</i>	
Total income	11.2	11.0	11.6	11.7	11.4	102
Employee costs	3.5	3.7	3.6	3.6	3.5	
Power	0.7	0.7	0.8	0.8	0.8	
Chemicals	0.1	0.1	0.1	0.1	0.1	
Other costs	3.2	3.0	2.8	3.1	3.0	
Operating expenditure before depreciation and equalisation levy	7.5	7.5	7.3	7.6	7.4	99
Depreciation	0.1	0.2	0.1	0.1	0.2	
Equalisation levy	0.7	—	—	—	—	
Operating expenditure after depreciation and equalisation levy	8.3	7.7	7.4	7.7	7.6	92
Financial expenditure*	2.2	2.2	2.5	2.5	2.4	
Contingency account transfers	1.0	1.0	1.0	0.9	1.0	
Mainstream corp tax	—	—	—	—	0.1	
Other items	—	0.0	0.2	0.1	0.1	
Total expenditure account costs	11.5	10.9	11.1	11.2	11.2	97
Surplus/(deficit)	(0.3)	0.1	0.5	0.5	0.2	

Source: Portsmouth.

* Financial expenditure is mainly dividend and interest payments and advance corporation tax.

Comment by Portsmouth

Portsmouth told us that the trend in total costs is affected by the inclusion of the equalisation levy payment in the base year of 1980-81. The only significant change in accounting policies arose in 1984-85 when capital issue expenses of £102,000 were written off in full rather than being charged to the expenditure account over the life of the stock concerned.

TABLE 6 West Kent: operating and other costs at 1984-85 prices

	£ million					1984-85 as a percentage of 1980-81
	1980-81	1981-82	1982-83	1983-84	1984-85	
Total income	2.8	2.9	3.0	3.0	2.9	104
Employee costs	1.0	1.1	1.1	1.1	1.1	
Power	0.3	0.3	0.3	0.3	0.3	
Chemicals	0.0	0.0	0.0	0.0	0.0	
Other costs	0.7	0.6	0.8	0.8	0.8	
Operating expenditure before depreciation and equalisation levy	2.0	2.0	2.2	2.2	2.2	110
Depreciation	0.2	0.2	0.1	0.2	0.2	
Equalisation levy	0.0	—	—	—	—	
Operating expenditure after depreciation and equalisation levy	2.2	2.2	2.3	2.4	2.4	109
Financial expenditure*	0.5	0.5	0.5	0.5	0.4	
Contingency account transfers	0.0	0.0	0.0	0.1	0.1	
Mainstream corp tax	—	—	—	—	—	
Other items	0.0	0.1	—	—	—	
Total expenditure account costs	2.7	2.8	2.8	3.0	2.9	107
Surplus/(deficit)	0.1	0.1	0.2	0.0	0.0	

Source: West Kent.

* Financial expenditure is mainly dividend and interest payments and advance corporation tax.

Comment by West Kent

The trend in costs of the company over the five-year period rose in real terms mainly due to employee and power costs. In addition the company had to meet substantial increases in costs as a result of a revised cumulo rating assessment during the period, the adoption of new computer systems and exceptional, non-recurring, repair costs associated with a major treatment works reconstruction in the Tunbridge Wells area during 1983 and 1984. On the other hand the company has achieved an 11 per cent overall reduction in manpower numbers and a reduction of finance costs in real terms. These savings together with other smaller but important economies have enabled the company to achieve one of its principal objectives which has been to keep year on year increases in charges to consumers during this period below the general level of inflation. This has been achieved without reducing standards or financial reserves.

TABLE 7 SWA: water supply—operating and other costs at 1984–85 prices

	£ million					1984–85 as a percentage of 1980–81
	1980–81	1981–82	1982–83	1983–84	1984–85	
Total income	46.2	45.9	48.1	47.7	48.2	104
Employee costs	12.2	12.1	11.8	11.8	11.3	
Power	4.7	4.8	5.2	4.8	5.0	
Chemicals	0.6	0.6	0.6	0.6	0.7	
Other costs	12.8	13.4	13.4	13.4	14.2	
Operating expenditure before depreciation and equalisation levy	30.3	30.9	31.0	30.6	31.2	103
Depreciation	5.5	2.2	2.8	3.1	3.5	
Equalisation levy	0.7	—	—	—	—	
Operating expenditure after depreciation and equalisation levy	36.5	33.1	33.8	33.7	34.7	95
Interest	11.3	9.7	9.7	10.0	10.1	
Contingency account transfers	—	—	—	—	—	
Mainstream corp tax	—	—	—	—	—	
Other items	(0.3)	(0.2)	0.9	—	—	
Total expenditure account costs	47.5	42.6	44.4	43.7	44.8	94
Surplus/(deficit)	(1.3)	3.3	3.7	4.0	3.4	

Source: SWA.

Comment by SWA

In the five years to 1984–85 the Authority reduced its operating expenditure from £36.5 million to £34.7 million at 1984–85 prices. The introduction of current cost accounting in 1981–82 significantly changed the basis on which the depreciation charge for the historical cost accounts is calculated and therefore a better comparison would be total expenditure less depreciation which moved from £42.0 million to £41.3 million in real terms. The reduction in employee costs has resulted from (a) the internal reorganisation of the divisions and Headquarters and (b) the continuing review of the manning levels for manual employees by all divisions. The reduction in manpower numbers from its peak of 4,256 in March 1980 to 3,336 in March 1985 has been a declared policy of SWA in the period covered. The real increase in power and chemical costs is principally caused by the continuing growth in demand for water (the volume of water put into supply increased by 10.2 per cent in the five years to 1984–85). In order to meet this increased demand the Authority is forced to abstract and pump water from sources whose marginal unit costs are high since all the cheaper sources are being fully utilised. The other costs comprise abstraction charges, rates, bought-in materials, supplies and services, and general miscellaneous items. These other costs have increased by £1.4 million in the period and there are various factors which account for this. Interest payments have been reduced primarily as a result of the lower level of borrowing and the lower overall level of interest rates in the period.

APPENDIX 5.3
(referred to in paragraph 5.33)

The accounting systems used by the undertakings at 30 June 1985 and planned for the future

Nature of accounting system	SWA	Eastbourne	Folkestone	Mid Kent	Mid-Sussex	Portsmouth	West Kent	
1. <i>Financial accounts</i>								
(i) state whether mainly manual or mainly computerised	Computerised	Computerised	Mainly computerised	Computerised	Computerised	Mainly computerised	Manual	
(ii) date principal current system introduced	1976	Jan 1985	1976	1979	Oct 1983– March 1985	Prior to 1975	1975	
(iii) date next major enhancement proposed (if any)	1985/86	Jan 1986 On-line enquiry revised creditor system	No major changes proposed	None	None	1986/87	1985 computerised nominal ledger package	
2. <i>Management accounts</i>								
(i) state whether mainly manual or mainly computerised	Computerised	Computerised	} Basic records are part of general ledger system. See reply to 1 above	Computerised	Integrated with financial accounts	Manual based on computer print-outs	Manual	
(ii) state date principal current systems introduced	1976	Jan 1985		1979	Oct 1983– March 1985	Prior to 1975	1975	
(iii) state date next major enhancement proposed (if any)	1985/86	Jan 1986 On-line enquiry		None	None	Full computerisation within 2 years	1985 computerised accounting/ budget reporting package	
3. <i>Unit cost data</i>								
(i) Is unit cost data available by category	Yes	Yes	Yes	Yes	Yes	} from 1.4.85	No	Yes
(ii) Is unit cost data available by function	Yes	Yes	Yes	Yes	Yes		No	Yes
4. <i>Customer billing—unmeasured supply</i>								
(i) State whether unmeasured billing system is computerised or manual	Computerised	Computerised	Computerised (ICL Database billing system) 1984	Computerised	Computerised ICL 'Waterate'	Computerised	} Company has just adopted the ICL 'Waterate' billing system (June 1985)	
(ii) State year principal current system installed	1979	1976	1984	1978	1983 (October)	1985		
(iii) State date next major enhancement proposed (if any)	1986	1987	No major enhancement proposed	None	Last enhancement March 1985 is annual billing			
5. <i>Customer billing—measured supply</i>								
(i) State whether measured billing system is computerised or manual	Computerised	Computerised	Computerised	Computerised	Computerised ICL 'Waterate'	Computerised	Phillips P.320 VRC Based system	
(ii) state year principal current system installed	1975	1979	1979	1978	January 1985	1981	1977	
(iii) state date next major enhancement proposed (if any)	1986	1988	Proposed to transfer to ICL Database billing system, end of 1985	under review	None	Overall system review shortly	To adopt ICL 'Waterate' billing system during 1986	

Source: SWA and the companies.

APPENDIX 6.1
(referred to in paragraph 6.1)

National performance ratios—SWA, and ranking among the ten water authorities

The following ratios are included by water authorities in their Annual Reports, to enable comparison at regional level. More detailed performance indicators are used for internal management purposes. Some ratios for years prior to 1984-85 have been revised, as necessary, since those published last year took account of availability of more accurate information. Caution should be exercised in interpreting the ratios shown since they largely reflect the physical environment within which the Authority discharges its statutory responsibilities. It should also be noted that the data used in the calculation of the ratios have in some cases been estimated. All cost related ratios are shown at 1984-85 equivalent prices, using specific inflation indices for power and rates elements and the Retail Price Index for all other costs.

	1980-81		1981-82		1982-83		1983-84		1984-85		Water industry weighted average 1984-85
	Ratio	National ranking	Ratio	National ranking	Ratio	National ranking	Ratio	National ranking	Ratio	National ranking	
<i>Water supply ratios</i>											
1. Operational expenditure (£) per head of population equivalent supplied:											
(a) Total	8.03	5	8.31	6	8.04	6	8.07	5	7.79	4	8.59
(b) Manpower	3.71	5	3.70	5	3.52	5	3.56	6	3.28	5	3.63
(c) Power	1.29	7	1.32	9	1.32	8	1.33	8	1.40	8	1.24
(d) Chemicals	0.16	3	0.18	4	0.17	4	0.18	4	0.19	4	0.22
2. Current cost depreciation (£) per head of population equivalent	—		—		—		—		2.54	3	3.27
3. Current cost operating profit (£) per head of population equivalent	—		—		—		—		3.00	2	1.71
4. Proportion (%) of water put into supply from:											
(a) Ground sources	70.7		70.6		71.4		69.9		69.0		27.9
(b) Surface sources	29.3		29.4		28.6		30.1		31.0		72.1
5. Proportion (%) of supplies which are:											
(a) Metered potable	28.3		27.4		28.6		25.7		26.0		24.1
(b) Metered non-potable	0.9		0.8		0.6		0.4		0.4		3.7
(c) Unmetered	70.8		71.8		70.8		73.9		73.6		72.2
6. Proportion (%) of resident population on supply	99.6		99.6		99.6		99.6		99.6		99.0
<i>Manpower ratios:</i>											
7. Manpower numbers per 1,000 head of population equivalent											
(a) Water supply	0.35	4	0.34	5	0.31	3	0.30	3	0.28	3	0.32
<i>Capital expenditure ratios:</i>											
8. Capital expenditure (£) during the year per head of population equivalent											
(a) Water supply	4.90	9	5.79	10	5.19	8	5.71	7	5.43	8	4.36

Source: SWA.

APPENDIX 6.2
(referred to in paragraph 6.10)

**SWA: divisional performance indicators, 1984-85—
national ratio equivalent**

	Divisions				<i>Regional (weighted) average</i>
	<i>IOW</i>	<i>Hants</i>	<i>Sussex</i>	<i>Kent</i>	
<i>Water supply ratios:</i>					
1. Operational expenditure (£) per head of population equivalent supplied:					
(a) Total	9.90	7.45	7.96	8.03	7.97
(b) Manpower	3.97	3.43	3.12	3.18	3.28
(c) Power	1.52	1.18	1.38	1.57	1.40
(d) Chemicals	0.31	0.09	0.23	0.21	0.19
2. Proportion (%) of water put into supply from:					
(a) Ground sources	72.3	61.2	68.5	76.2	69.0
(b) Surface sources	27.7	38.8	31.5	23.8	31.0
3. Proportion (%) of supplies which are:					
(a) Metered potable	20.1	28.4	21.6	30.9	26.0
(b) Metered non-potable	—	1.3	0.2	—	0.4
(c) Unmetered	79.9	70.3	78.2	69.1	73.6
4. Proportion (%) of resident population on supply	99.7	98.8	99.8	100.0	99.6
<i>Manpower ratios:</i>					
5. Manpower numbers per 1,000 head of population equivalent					
(a) Water supply	0.36	0.29	0.28	0.26	0.28
<i>Capital expenditure ratios:</i>					
6. Capital expenditure (£) during the year per head of population equivalent					
(a) Water supply	10.54	6.09	4.93	4.35	5.43

Source: SWA

APPENDIX 6.3
(referred to in paragraph 6.14)

Performance indicators, unit costs etc used in the water industry for comparison purposes

	(1) <i>Used and published by SWA and all water authorities</i>	(2) <i>Used by SWA and/ or its four divisions (not published)</i>	(3) <i>Used by WCA and all 28 water companies (not published)</i>
1. <i>Operational expenditure per head of equivalent population</i> supplied (with further cost breakdown)	x	x	
2. <i>Manpower per 1,000 head of equivalent population</i> supplied	x	x (with further cost breakdown for the divisions)	
3. <i>Annual capital expenditure</i> per head of equivalent population	x	x	
4. <i>Current cost depreciation</i> £ per head of equivalent population	x		
5. <i>Current cost operating profit</i> per head of equivalent population	x		
6. <i>Cost per head of equivalent population</i> —direct costs including 1st line support services (with further cost breakdowns)		x	
7. <i>Cost (as in 6) per megalitre put into supply</i> (with further cost breakdown)		x	x (With further cost breakdown)
8. <i>Expenditure per km of main</i> (with further cost breakdown)		x	
9. <i>Employee cost per connection</i> (revenue cost)		x	
10. <i>Billing costs</i> —several ratios, including direct billing cost per account, for unmeasured and measured customers		x (SWA only: comparisons are made between all water authorities)	*
11. <i>Computing costs</i> —various ratios including costs per employee, per customer and per head of equivalent population		x (SWA only)	
12. <i>HQ costs</i> as percentage of (i) divisional costs (ii) income, separately for the Finance and Administration functions (with further cost breakdown)		x (SWA only)	
13. <i>Revenue costs per property supplied</i>			x
14. <i>Revenue manpower (numbers)</i> per (i) property supplied (ii) megalitre per day, with other manpower data and costs			x
15. <i>Number of properties</i> per (i) km of main (ii) sq km of area			x
16. <i>Average pumping head</i> , and statistics on treatment style			x
17. <i>Several financial facts</i> including average cost of capital, dividends, ACT, interest paid, capital charges and general rates			x
18. <i>Manpower costs</i> analysed in various ways, including per megalitre and per property			x
19. <i>Power costs</i> relative to head lift and water output			x
20. <i>Abstraction, rates and sewerage costs</i> per megalitre			x
21. <i>Transport cost ratios</i> (numerous)			x

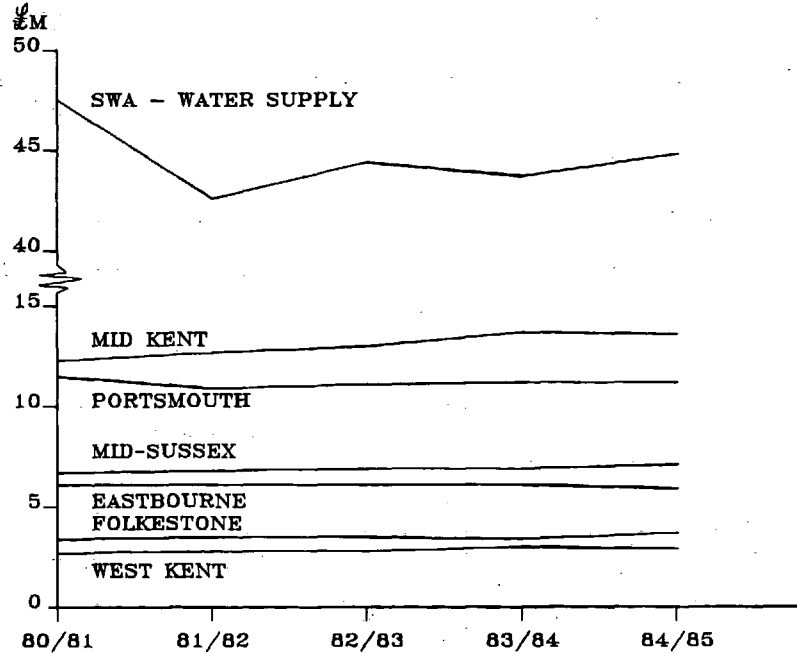
Source: MMC study, based on information from SWA, the WCA and the companies.

* Will be included in future.

APPENDIX 6.4
(referred to in paragraph 6.19)

Total costs—operating expenditure and finance

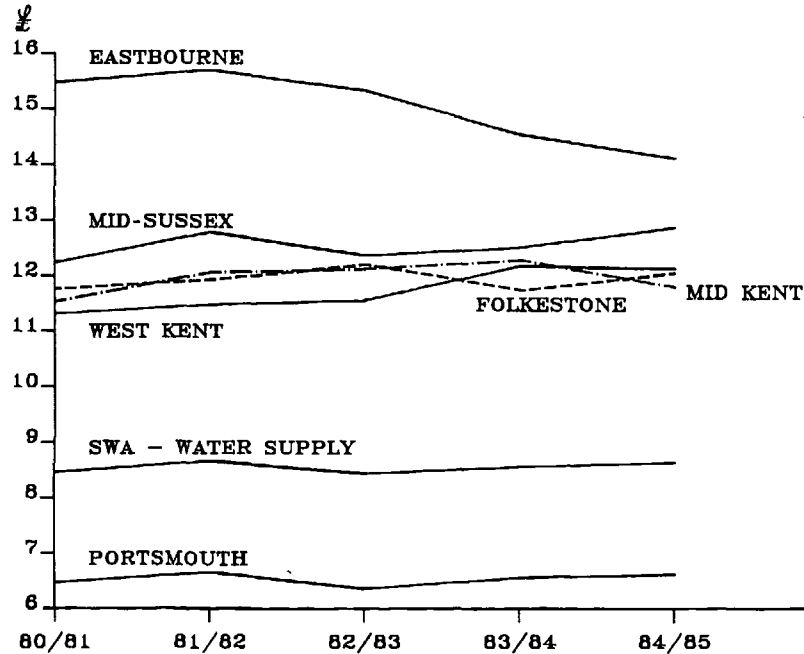
RPI adjusted to 1984-85



APPENDIX 6.5
(referred to in paragraph 6.19)

Operating costs per head of equivalent population

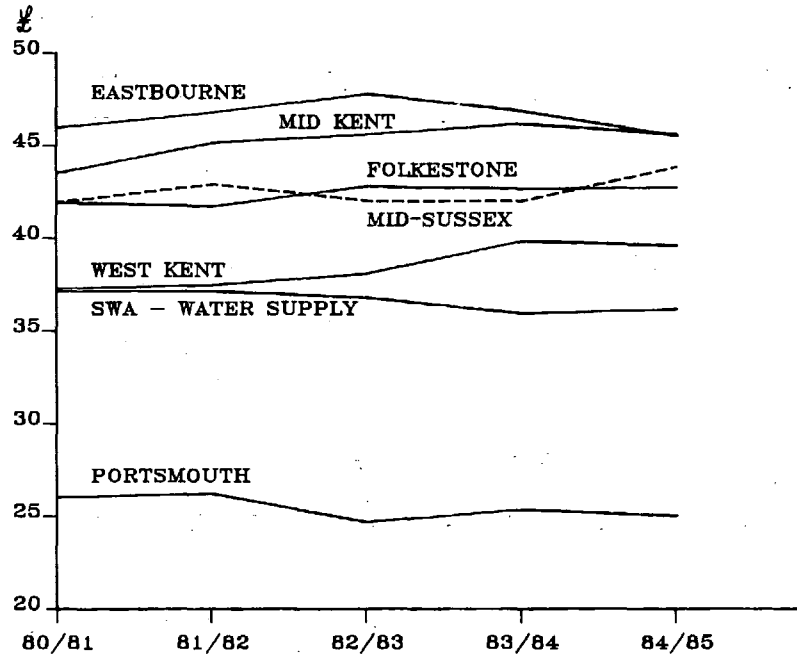
RPI adjusted to 1984-85



APPENDIX 6.6
(referred to in paragraph 6.19)

Operating costs per property supplied

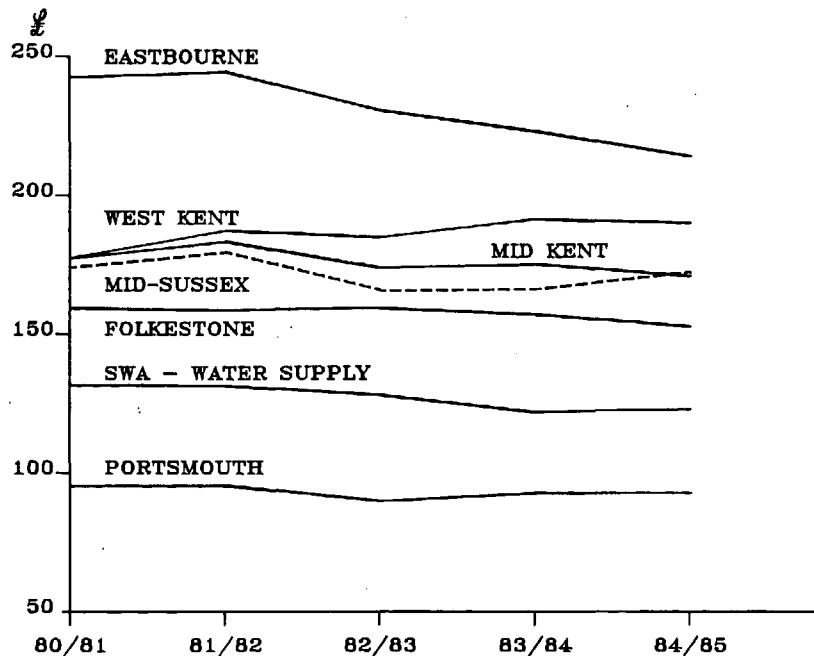
RPI adjusted to 1984-85



APPENDIX 6.7
(referred to in paragraph 6.19)

Operating costs per megalitre water put into supply

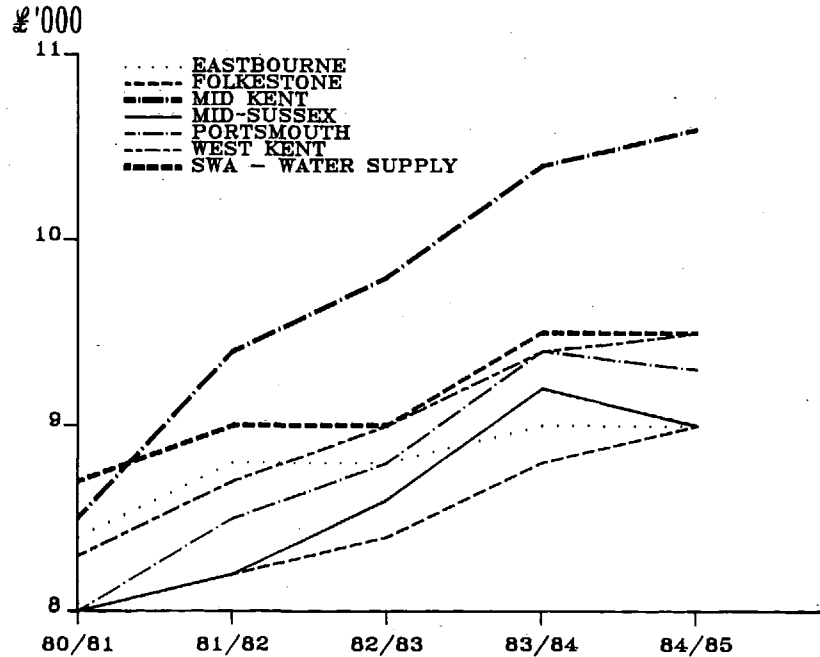
RPI adjusted to 1984-85



APPENDIX 6.8
(referred to in paragraph 6.19)

Average annual salaries and wages per employee

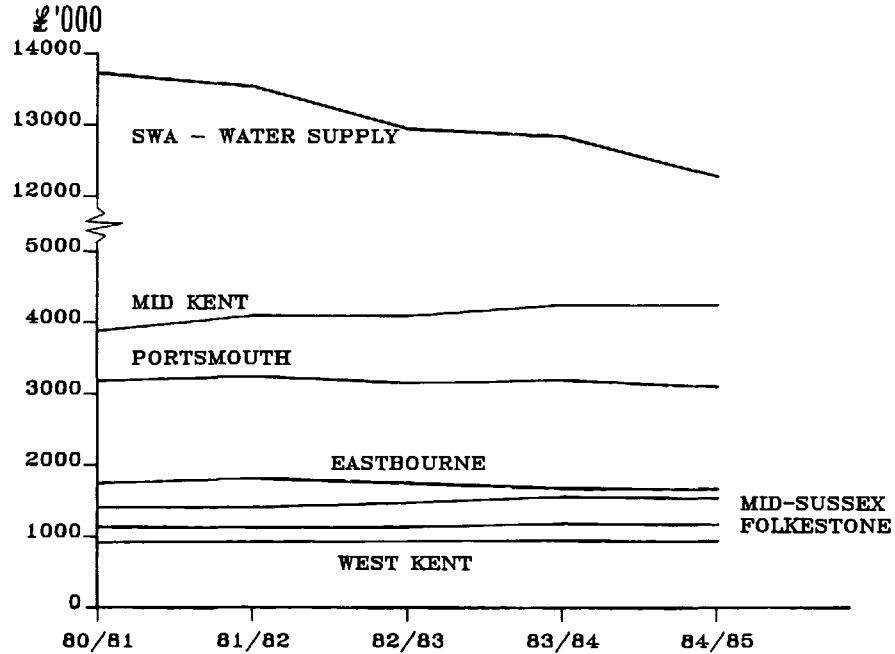
RPI adjusted to 1984-85



APPENDIX 6.9
(referred to in paragraph 6.19)

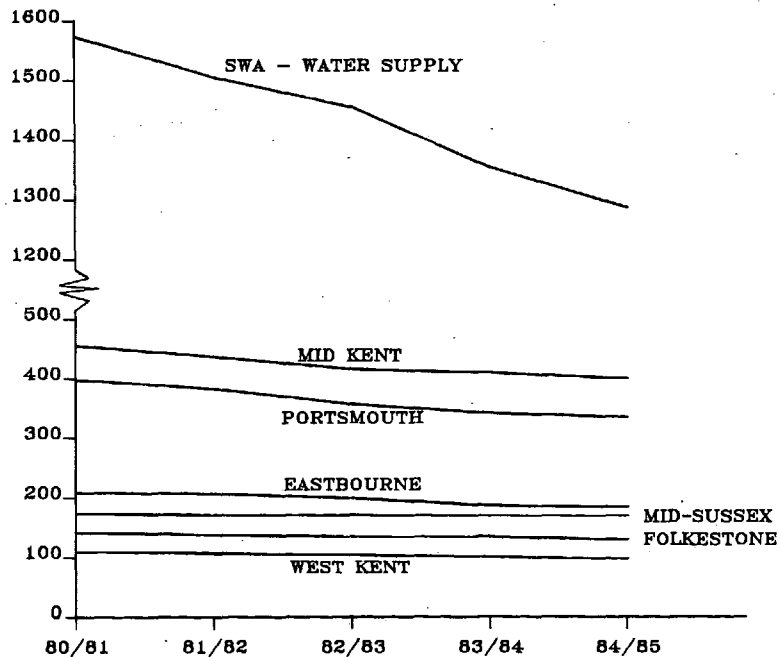
Total gross salaries and wages

RPI adjusted to 1984-85



APPENDIX 6.10
(referred to in paragraph 6.19)

Total employee numbers



APPENDIX 6.11
(referred to in paragraph 6.20)

**Cost trends, 1984–85 as a percentage of 1980–81
(costs excluding depreciation and the water rate equalisation levy
for (b) to (d) and (j) to (m))**

	Percentage change						
	E	F	MK	MS	P	WK	SWA*
1. High level statistics and performance indicators							
(a) Total cost of water supplied	97	109	111	106	97	107	94
(b) Operating costs per head of equivalent population	91	102	102	105	102	107	102
(c) Operating costs per property supplied	99	102	105	104	96	106	97
(d) Operating costs per megalitre of water supplied	88	96	96	99	97	107	93
2. Indicators of main categories of cost							
(e) Employee costs per head of equivalent population†	89	95	110	104	97	103	91
(f) Average gross salaries and wages per employee	107	112	125	112	116	114	109
(g) Unit labour costs per standard hour earned‡	88	105	106	101	110	112	114
(h) Power costs per megalitre of water supplied§	92	100	93	102	100	106	96
(i) Chemical costs per megalitre of water supplied¶	108	—	—	94	—	—	104
3. Costs of particular functions 							
(j) Abstraction and treatment costs per megalitre of water supplied	90	91	95	96	97	101	88
(k) Conveyance and distribution costs per kilometre of mains	97	118	111	110	91	121	103
(l) Total central and administrative costs	102	100	104	107	97	107	104
(m) Central and administrative costs per property supplied	99	97	100	102	95	102	98

Source: SWA and the companies.

* SWA—SWA figures are for water supply only.

† Other costs to be considered with this indicator would include bought-out services, to allow for different policies on the use of outside contractors.

‡ Trends in performance 1984–85 as a percentage of 1981–82.

§ A more useful measure would be power costs relative to head lift and water output (as in the existing WCA indicator) providing allowance is also made for the effects of water quality problems.

¶ For Folkestone, Mid Kent, Portsmouth and West Kent, the costs are not significant and therefore the trends are not shown.

|| These figures do not include 'cumulo rates'.

APPENDIX 6.12
(referred to in paragraph 6.20)

**Cost trends, 1984–85 as a percentage of 1981–82
(costs excluding depreciation and the water rate equalisation levy
for (b) to (d) and (j) to (m))**

	Percentage change						
	E	F	MK	MS	P	WK	SWA*
1. High level statistics and performance indicators							
(a) Total cost of water supplied	97	106	107	104	103	104	105
(b) Operating costs per head of equivalent population	90	101	98	101	99	106	100
(c) Operating costs per property supplied	97	102	101	102	95	106	97
(d) Operating costs per megalitre of water supplied	88	96	93	96	97	101	94
2. Indicators of main categories of cost							
(e) Employee costs per head of equivalent population†	88	100	100	102	100	100	91
(f) Average gross salaries and wages per employee	102	110	113	110	109	109	106
(g) Unit labour costs per standard hour earned	88	105	106	101	110	112	114
(h) Power costs per megalitre of water supplied‡	90	94	89	93	103	99	95
(i) Chemical costs per megalitre of water supplied§	99	—	—	80	—	—	100
3. Costs of particular functions¶							
(j) Abstraction and treatment costs per megalitre of water supplied	87	94	93	92	97	100	91
(k) Conveyance and distribution costs per kilometre of mains	96	107	103	103	90	115	103
(l) Total central and administrative costs	97	104	101	111	95	105	96
(m) Central and administrative costs per property supplied	96	101	98	107	92	102	92

Source: SWA and the companies.

* SWA—SWA figures are for water supply only.

† Other costs to be considered with this indicator would include bought-out services, to allow for different policies on the use of outside contractors.

‡ A more useful measure would be power costs relative to head lift and water output (as in the existing WCA indicator) providing allowance is also made for the effects of water quality problems.

§ For Folkestone, Mid Kent, Portsmouth and West Kent, the costs are not significant and therefore the trends are not shown.

¶ These figures do not include 'cumulo rates'.

APPENDIX 6.13
(referred to in paragraph 6.20)

**Customer billing—direct cost per account and total direct costs,
1984-85*
(historical costs)**

	<i>Unmeasured accounts</i>			<i>Measured accounts†</i>		
	<i>Direct costs per account</i>	<i>% against the average</i>	<i>Total direct costs</i>	<i>Direct costs per account</i>	<i>% against the average</i>	<i>Total direct costs</i>
	£	%	£'000	£	%	£'000
Eastbourne	1.83	87	128	15.50	129	85
Folkestone	3.57	169	182	14.33	119	43
Mid Kent	2.24	106	312	8.80	73	132
Mid-Sussex	2.02	96	186	12.85	107	81
Portsmouth	1.76	83	333	12.00	100	108
West Kent	2.18	103	98	10.45	87	23
SWA (all services)	2.11	100	3,012	12.14	101	716
Weighted average per account	2.11	100		12.00	100	

	<i>Unmeasured accounts</i>				<i>Measured accounts</i>				£
	<i>direct costs per account</i>				<i>direct costs per account</i>				
	<i>Total</i>	<i>Staff</i>	<i>Computer</i>	<i>Others</i>	<i>Total</i>	<i>Staff</i>	<i>Computer</i>	<i>Others</i>	
Eastbourne	1.83	0.98	0.21	0.64	15.50	9.11	4.10	2.29	
Folkestone	3.57	2.00	0.65	0.92	14.33	9.00	3.33	2.00	
Mid Kent	2.24	1.37	0.37	0.50	8.80	5.87	1.13	1.80	
Mid-Sussex	2.02	0.76	0.53	0.73	12.85	8.41	2.06	2.38	
Portsmouth	1.76	0.85	0.41	0.50	12.00	8.22	1.67	2.11	
West Kent	2.18	0.87	0.62	0.69	10.45	8.18	0.45	1.82	
SWA (all services)	2.11	0.87	0.59	0.65	12.14	7.02	1.58	3.54	

Source: MMC study from SWA and company information.

* Direct costs do not include bad debts and legal fees.

† The figures for the water companies' measured accounts are shown before the receipt of about £70,000 from SWA and other water authorities for the provision of information for sewerage billing purposes. These sums are paid for the provision of information by the companies on those metered properties where the authorities provide sewerage services and amount to some £3.50 for each of those properties. These receipts are not deducted from the companies' costs as shown above because the companies have to incur all the costs shown in the tables in order to do their own billing.

APPENDIX 6.14

(referred to in paragraph 6.27)

Water companies: relationship of net manpower costs plus contract services costs to properties supplied

Net manpower cost
plus contract services

£M

11

10

9

8

7

6

5

4

3

2

1

0

LINEAR REGRESSION
 $y=0.23+1.63x$
 $r^2=0.94$

0

1

2

3

4

5

6

Properties supplied (100,000's)

170

WK

F

E

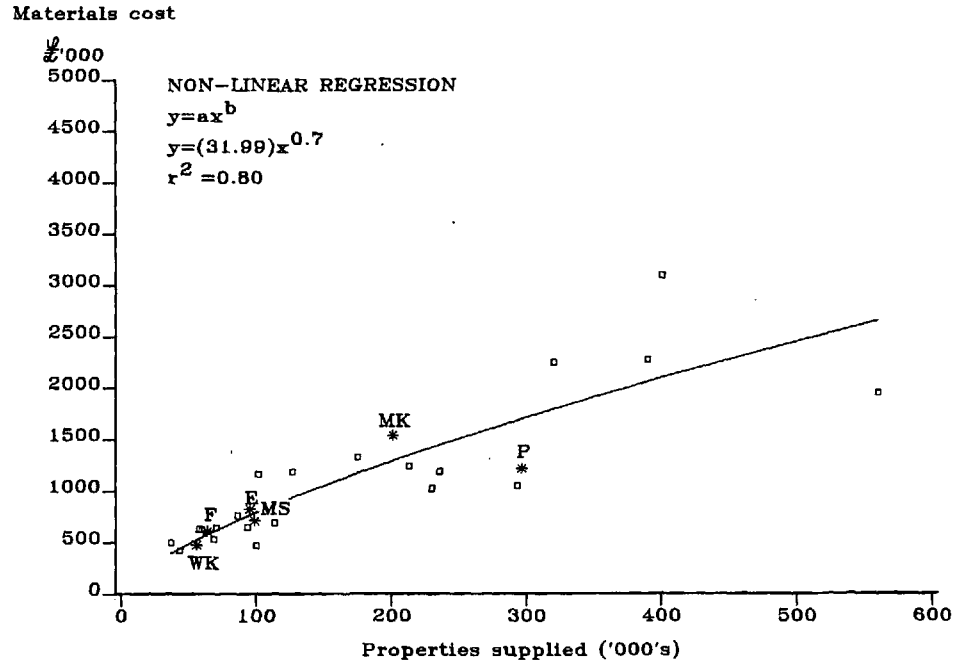
MS

MK

P

APPENDIX 6.15
(referred to in paragraph 6.27)

Water companies: relationship of materials costs to properties supplied



APPENDIX 7.1
(referred to in paragraph 7.20)

Water companies: board reports

Reports received by boards of water companies, other than those referred to in Table 7.3

<i>Report</i>	<i>Report subject matter</i>	<i>Frequency</i>
<i>Eastbourne</i>		
Review of insurance		Annually
Recreation & amenity expenditure accounts		Annually
Meetings diary		Annually
Effect of Government budget on company		Annually
SWA—section 12 capital expenditure requirements		Annually
Stores disposal report		6-monthly
Annual General Meeting		Annually
Extraordinary Shareholders' Meeting		As required
Properties review		As required
Rent review		As required
Computer hardware review	Mainframe computer replacement	As required
Statutory Instruments	Applications for listing particulars.	As necessary
Environmental issues	Including sites of special scientific interest, local nature reserve and national nature reserve.	As necessary
Recreation and amenity		Annually
Pensions review		Annually
Short-term borrowings/investment		Monthly
Day-to-day departmental requirements		Monthly
Land purchase wayleave agreements		As required
Water Companies' Association	Matters to report.	Monthly
Consumer Consultative Committee	Matters to report.	Monthly
<i>Folkestone</i>		
Monthly revenue account and balance sheet	Part of monthly management report.	Monthly
Vehicle and plant review	Cumulative lifespan, mileage, cost etc.	Annually
Management accounts	Detailed summary of outputs, work done, performance indicators and costs.	Annually
Various departmental reports	Matters arising (insurance, productivity, bank charges, rent reviews, operational reports, WCA, CCC).	As required
<i>Mid Kent</i>		
Reports from divisions	Included in GM's report	Monthly
Income	Included in financial report.	Monthly
Authorised capital		As required
Issue of capital and borrowings		As required
Asset leasing		As required
Water charges		As required
Banking arrangements		As required
Insurance (changes in cover)		As required
Office equipment		As required

<i>Report</i>	<i>Report subject matter</i>	<i>Frequency</i>
Water supply situation		As required
Demand forecasting		As required
Demand management		As required
Water byelaws		As required
Consumer Consultative Committees		As required
Annual salaries/wages negotiations and settlements		As required
Pensions and funding		As required
Housing and rents		As required
<i>Mid-Sussex</i>		
Manpower	Review of manning levels in medium term.	As required
Mortgages	Summary of loans received, renewed or repaid.	Monthly
Property	Condition of buildings and review of properties let.	Annually
Insurances	Claims record and renewal premiums.	Annually
Public relations	Review of publicity and visits.	Annually
Safety	Safety review.	Annually
Income	Unmeasured cash received v budget.	Monthly
	Measured billed income v budget.	Monthly
	Measured volume v budget.	Monthly
Overtime	No. of hours for month and total to date by section.	Monthly
Transport and plant	Review of requirements.	Annually
Computers	Review of 2-year plan.	Annually
<i>Portsmouth</i>		
Revenue comparisons	Unmeasured and measured income and details of large measured and unmeasured consumers and metered consumption all figures compared with corresponding period in previous year.	Quarterly
Water revenue collection	Unmetered and measured water revenue collectable voids, bad debts and arrears compared with previous year. Also information on the payment pattern and supplementary accounts.	Half-yearly
Secretary and Treasurer's report	Annual accounts.	Annually
Corporation tax	Details of corporation tax position as soon as the computation has been agreed with the Inland Revenue.	Annually
New plant	Review of mobile plant requirements.	Annually
<i>West Kent</i>		
Vehicles and new plant	Utilisation and replacement policy review.	Annually.
Properties and Land		As required
Water Companies Association	Items for report.	Monthly
Revenue collection statement	Unmeasured and measured income received and arrears.	Monthly

Source: The companies.

APPENDIX 7.2

(referred to in paragraph 7.22)

Water companies: management information systems

Activity	Arrangements in the companies	
	Eastbourne	Folkestone
Water resources	Part computer, part manual information on rainfall and ground water levels. Generally integrated with water supply system (below).	Manual systems for the collection of borehole levels, weekly abstraction. Information stored on computer archive for immediate reporting and later analysis.
Water supply and treatment	Comprehensive computer-based system for control of treatment and supply, providing information for day-to-day matching of supply to demand, and for annual operational planning.	Mainly manual/time control/local control in response to demand for pumping and chlorination. Simple system for relatively straightforward look. Computer-based system for keeping statistics.
Water supply distribution	Manual systems covering work in hand, burst mains, discolouration and mainlaying, defect notices, chargeable work and overtime. Control on day-to-day basis largely informal. Mains analysis computer-based. Computer system for reinstatement scheduling.	Manual systems for planning and controlling work done on burst mains, emergency work, mainlaying etc, but overall control and annual budget/plan provided through labour control/budgetary control system.
Capital programme new works	Computer-based financial project management programme for comparison of actual against authorised expenditure. Manual comparison of total spent and committed by project against authorisations. Manual capital works design and construct progress reporting system. On-line enquiry facility updated weekly on all capital projects from 1 January 1986.	Computer system produces monthly reporting on progress of all capital works and details cost, volume and timing variances from budget.
Capital programme mainlaying	Monthly reporting by Superintendents. Work sheets and informal arrangements for contracts (or control and monitoring of contractors) for day-to-day progress.	
Plant maintenance	Computer-based plant scheduling and plant maintenance analysis.	Plant maintenance arranged through manual maintenance planning system.

<i>Activity</i>	<i>Arrangements in the companies</i>	
Mobile plant and vehicles	Vehicle cost statistics available in computer accounting system.	Collected as part of management accounting system.
Stock control	Computer systems provide daily batch processing of stock movements. Stock management provided by system.	Computer system provides stock control and stock accounting. Movements updated daily. Costing weekly.
Management accounting	Budgetary control system, microprocessor-based, with facility for job costing. Reporting of physical activity not integrated with cost analysis and reporting.	Budgetary control system, fully computerised, on standard costing principles. Reporting of physical activity integrated into costing system, providing variance by price and volume.
Billing	Computer-based system. Batch processing for file updates. On-line enquiries.	Use of ICL 'Waterate' system for unmeasured. Desk-top computers on-line to mainframe provides on-line enquiry system for unmeasured. Measured to be transferred to 'Waterate' from in-house designed system in October 1985.
Labour control	Costing and payroll analysis and bonus analysis from computer payroll system.	Payroll, productivity, labour controls, productivity data bank all provided by computer systems. Special computer system for inspector's productivity on desk-top computers.
Underground assets	Size and material of mains recorded on plans. 'Mains ledger' shows details of all mains laid. Burst mains reports logged. Flushing records indexed to mains records. Condition of mains surveyed for relining programme.	Records on O/S sheets. No formal system for recording condition of mains when repairs occur although under consideration.
Fixed assets	Manual fixed asset register.	Computer plant register, but not yet used for planned maintenance system. Manual system for planning maintenance.
Water quality	Regular programme of sampling and analysis; bacteriological information stored on mainframe computer; microcomputer in lab. Chemical information on cards with transfers to mainframe computer.	Sampling of chemical and bacteriological quality by plant attendant, processed by Mid Kent.
Service levels	See above for water quality. No formal monitoring of service levels. Response times and pressure requirements known by local management.	No formal monitoring of service levels, but this to be revised.

<i>Activity</i>	<i>Arrangements in the companies</i>	
Complaints	Customer complaints logged and followed up. Six-monthly analysis of complaints.	A system for complaints and response time monitoring has recently been put in place for the purpose of reporting to the CCCs.
Other systems	Computer system for water mains network analysis. Computer-based share registration.	Computer systems for dividends/shareholders and for electricity usage and forecasting.
Leakage control	Microcomputer-based data handling and information systems, designed to assist in the effective implementation of a comprehensive leakage control policy. The system obtains information from bulk flow meters and produces details of flow rates etc.	
	<i>Mid Kent</i>	<i>Mid-Sussex</i>
Water resources	Computer system for recording (from manual collection system) information about water storage, water pumped, area consumption, rainfall, incorporating supply information (see below).	Manual and computer-aided systems are used to record, tabulate, evaluate or graphically represent information on rainfall, river flows, raw water storage, demand and well levels, to assess long- and short-term availability at source against predicted demands.
Water supply and treatment	Generally control of pumping stations and treatment works is by division with local, automatic failsafe. Programme of reinstrumentation prior to installation of telemetry system.	Use of automatic controls with data acquisition and alarm systems. Inter-site telemetered communications and on-site treatment monitoring and control.
Water supply distribution	Manual systems for planning, scheduling and controlling work in distribution departments. Computer system for leakage information being developed.	Manual systems for planning, scheduling and controlling work. On-line computerised system is under consideration. Computer system for control of reinstatements.
Capital programme new works	Control mainly through manual systems. Computer print-outs on job costs provided monthly to project engineers.	Computer-aided and manual systems are used for long-term planning. Project controls are exercised manually and financial control is provided via the Management Information System.
Capital programme mainlaying	Manual systems for planning, scheduling and monitoring. Job costing available from computer costing system.	Manual systems used for planning and execution. Financial controls are provided via the Management Information System.

<i>Activity</i>	<i>Arrangements in the companies</i>	
Plant maintenance planning	Different divisional systems, all manual, in use in company.	Manual systems for planning and scheduling maintenance.
Mobile plant and vehicles	Computer system for production of half-yearly statistics and costing for transport and mobile plant.	Manual systems for planning and scheduling supported by the Management Information System for mileage/efficiency monitoring.
Stock control	Batch updating computer-based stores accounting system with stock management analysis information available.	A manual stock management/computer stores ledger. An on-line stock control system integrating order processing and accounts payable is under consideration.
Management accounting	Computerised budgetary control and management accounting system providing costing of sub-function (eg individual pumping stations), and costs by category (eg labour, materials etc).	McCormack and Dodge GL-Plus computer package recently installed. The system is capable of a wide range of financial and physical management information. Further facilities are still being developed.
Billing	In-house designed billing computer system for unmeasured; measured system is decentralised, with basic computer processing done at Snodland.	ICL 'Waterate' package in use for unmeasured and measured accounts. Annual payment and instalment facilities recently introduced. On-line updates.
Labour control	Computer-based payroll, productivity and performance system.	ICL payroll package, with on-line enquiry facilities.
Underground assets	Information on condition of mains obtained when bursts etc occur is transferred via a WRE type form to computer storage.	Manual systems and OS maps are used to record the position and condition of mains and ancillary apparatus.
Fixed assets	Computerised asset register for calculating depreciation on both historic and current costs. Wide variety of different, manual systems in use in the company.	McCormack and Dodge fixed asset register computer package FACIA currently being implemented.
Water quality	Chemical analysis data maintained and analysed on computer mainframe. Laboratory carries out all usual tests for water quality.	Bacteriological and chemical analysis in company's own lab. ICL 'Filter' package used for laboratory management, quality control and report writing.
Service levels	Studies in progress to determine most appropriate measures and frequency for reporting. These include availability, adequacy and interruptions of supply.	Water quality and burst mains are formally monitored. The complaints log is used as a measure of consumer acceptability.

<i>Activity</i>	<i>Arrangements in the companies</i>	
Complaints	New computer system in operation.	Complaints are formally logged and followed up. Monthly and annual analysis of complaints are carried out.
Other systems	WATNET available on SWA's computer through local terminal. Dividends/shareholders system.	Microcomputers linked to zone meters and pressure reducing valves for leakage control.

Portsmouth

West Kent

Water resources	Rainfall etc. Pumping statistics on abstraction and consumption produced weekly. Annual summary of rainfall, and other data, including underground water levels, output of springs and river flow.	Telemetry assisted manual systems for collection and processing of rainfall, spring flow and borehole yield data.
Water supply and treatment	Pumping statistics held on computer for which input prepared manually and used for local control.	Apart from two treatment works (24-hr manning) all source works, treatment works and booster pumping stations operated by local automation or remote control with remote monitoring. Continuous monitoring from Cramptons Road.
Water supply distribution	Manual systems.	Manual systems for planning, scheduling and controlling work in distribution, repair and maintenance. Costing to be transferred to Apricot microcomputer ('Job Cost' program).
Capital programme new works	Manual systems.	Manual systems for control and scheduling; cost reports from accounting system.
Capital programme mainlaying	Manual systems for progress. Monthly comparison of major actual project cost v estimates, and post-project appraisal.	Manual systems for control and scheduling; cost reports from accounting system.
Plant maintenance planning	Manual systems based on routine maintenance cycle.	Manual systems for control and scheduling; cost reports from accounting system.
Mobile plant and vehicles	On-line computer system TRANMAN in use for motor vehicle management and costing.	Manual system for recording and costing running and maintenance to be transferred to Apricot microcomputer (Supercalc).

<i>Activity</i>	<i>Arrangements in the companies</i>	
Stock control	Stores accounting processed on computer, manual system for stock control and management but computer system being developed.	Manual stock management currently being transferred to Apricot microcomputer (Tetraplan and 'Job Cost' program).
Management accounting	Financial accounting system run on computer, with management accounting information, and rechargeable job costing provided manually.	Present system is manual supported by Philips VCR equipment. ICL DRS system being installed to provide financial accounts, expenditure analysis and budgetary control.
Billing	In-house developed measured and unmeasured computer systems with on-line enquiry.	ICL Waterate system run on Essex Water Company mainframe computer for unmeasured billing through local terminal. Measured billing currently run on in-house Philips VRC equipment.
Labour control	Computer payroll system. Productivity information processed by computer and manually. Computerisation being extended.	Philips VCR payroll system. Manual productivity control systems, assisted by use of Husky 'Manservant' work study package with future use of Apricot microcomputer ('Kudos' program).
Underground assets	Underground assets position and material cost recorded on overlays to OS maps. Recent survey of surface box positions. Incidence of bursts marked on maps. Plan to use OS digitisation in long term.	OS map-based system. Information from bursts etc formally collected and stored whenever mains exposed. Will be integrated with network analysis data in 1986 using IBM micro (WATNET program).
Fixed assets	Manual plant register. Manual planned maintenance systems based on standard maintenance cycles.	Manual plant register.
Water quality	Laboratory provides analysis of 6,000 samples per year for chemical and bacteriological purity. Computer archive system in operation.	Manual generation of sampling programme including reports, recording and statistical analysis of results. Computer storage of summaries of samples (Supercalc). Investigating use of 'Sample Management System' program for use with IBM micro-computer.
Service	Computerised defects system.	Emphasis on water quality and pressure surveys. Customer satisfaction survey carried out in 1984 by SWA for all companies and SWA.

Activity
Complaints

Complaints are formally logged and followed up. Annual analysis of complaints to be extended and refined for presentation to CCCS, using a computer system.

Arrangements in the companies.

Formal manual complaint monitoring for internal use and for reporting to Consumer Consultative Committee.

Other systems

Unaccounted-for water: manual system for data collection and processing. Will be assisted by Network Analysis package in 1986.

Source: The companies.

APPENDIX 8.1
(referred to in paragraph 8.38)

West Kent Water Company: incentive scheme for salaried staff

1. The Scheme was designed to provide an incentive for all salaried staff to earn a percentage bonus related to increased efficiency. Under the scheme the attention of staff is directed particularly to improving output and reducing costs through flexibility in working, punctuality, ensuring the availability of materials, promptness and accuracy in communications, preciseness and clarity of instructions, and effective supervision.

2. Bonus is payable based on the following factors:

- (a) a 'lieu' bonus (replacing the 2 per cent per annum customary bonus previously paid);
- (b) the effective performance of the Distribution Section;
- (c) the cost efficiency of the Distribution Section;
- (d) the cost efficiency of the Yard Section; and
- (e) the cost efficiency of the Supply Section.

3. Effective performance (EP) is defined as $\frac{\text{Standard hours of output}}{\text{Attendance hours}}$ and cost efficiency (CE) is defined as $\frac{\text{Budgeted unit costs}}{\text{Actual unit costs}}$. Standard hours of output, attendance hours, budgeted and actual unit costs are calculated for the purposes of the scheme by averaging the values in the Operations Control Ledgers over periods of 26 weeks.

4. Incentive bonuses are earned from values which apply on a whole undertaking basis. Bonus payments are made twice a year and are based on the average of the relevant values over the preceding 26 weeks. The following percentages of basic salary at the time each payment is due are made subject to the stipulated performance requirements being met:

	%
(a) Lieu bonus	1.0
(b) EP (Distribution Section) equal to or exceeding 0.90	0.5
(c) CE (Distribution Section) equal to or exceeding 0.95	0.5
(d) CE (Yard Section) equal to or exceeding 0.95	0.5
(e) CE (Supply Section) equal to or exceeding 0.95	0.5

The maximum half-yearly incentive payment is 3 per cent of basic salary at date of payment.

5. Management reserves the right to withhold part or all of the incentive payments to an individual or group following periods of work inconsistent with the factors referred to in paragraph 2 above, or for unsatisfactory work.

APPENDIX 8.2

(referred to in paragraph 8.39)

The Mid Kent Water Company: productivity payment scheme

1. The present company productivity payment scheme was introduced in 1969. Performance is measured in terms of manhours worked and charged to revenue account per property supplied per week and, in principle, a bonus equivalent to half any savings achieved through increased performance, is paid half yearly.

2. Bonus is expressed as a percentage of remuneration and calculated as follows:

$$\text{Bonus \%} = 0.5 \times \frac{(\text{unit cost} - \text{period cost})}{\text{unit cost}} \times 100$$

3. A base unit cost of 0.0930 was fixed following detailed analysis of wages sheets and payroll for the three financial years, 1963-64, 1964-65, and 1967-68. Records for 1966-67 were considered as not representative because of variations in work load caused by external factors.

4. The original base unit cost of 0.0930 manhours per property has subsequently been adjusted as follows:

1971	Amalgamation with Maidstone Water Company (ie inclusion of Maidstone manhours and properties)	0.0967
1971	Re-definition of 'property' and correction of previously inaccurate figures	0.1063
1973	Additional staff	0.1109
1974	Additional staff	0.1114
1981	Staff reduction	0.1113
1982	Inclusion of long-term sickness and of cleaning staff (part-time) manhours	0.1135

(Note: The staff additions and reductions all related to specific changes in workload resulting from transfers of work from other undertakings, increased statutory responsibilities, re-organisation, etc.)

5. No adjustments have been made for capital expenditure on computing or other equipment as in each case this has been discounted against increased output (eg management information, quality control).

6. When a separate WIPP Scheme for industrial employees was introduced in 1980, the existing scheme was retained for non-industrial staff but a two part bonus was adopted, as set out opposite:

<i>Function</i>	<i>WIPPS</i>		<i>Existing company scheme</i>
	<i>Divisional scheme</i>	<i>All company scheme</i>	
Superintendents, Assistants, supporting clerical personnel and Inspectorate	50%	—	50%
Divisional staff	25%	—	75%
Head Office staff	—	25%	75%

APPENDIX 10.1

(referred to in paragraph 10.15)

The Resource Allocation and Costing System: a brief description

1. The Resource Allocation and Costing System (RACS) is a suite of computer programs developed by the Water Resources Board and the Central Water Planning Unit and subsequently modified by SWA Resource Planning staff. It is a general package which is made specific to the water supply system under consideration by the careful selection of appropriate input parameters.

2. A RACS study is used to evaluate alternative programmes of resource development by introducing constraints on the relevant components, where a component may be defined as a numerical representation of a feature of the supply system, such as a water main or a treatment works: there are nearly 500 components in the Kent and Rother-Folkestone RACS Studies. Constraints may take several forms, the most common of which include disallowing the introduction of a component, specifying its date of currency, and restricting its development. There are two classes of input data: firstly those which are known or fixed (such as installed capacities and operating costs of existing components); and secondly those which are estimates or forecasts (such as future levels of demand for water, and capital costs of potential new developments).

3. A RACS study works on a number of demand districts, which are usually single or grouped pressure zones based on service reservoirs, and which usually conform to the established pattern of the local supply system: this helps in the forecasting of demands. Kent RACS uses 24 standard demand districts and a number of others which are devices to accommodate peculiar local features of the system (for instance sinks to remove temporary non-real surplus resources). For each demand district an estimate of water demand is input for each year of the planning period, for both the average day (year) and average day (peak week).

4. All components of the study are specified with various types of information as appropriate. Surface water and groundwater sources are described by their yields, years of currency, running cost (which for groundwater is normally for pumping and chlorination), and estimated capital costs for potential or future schemes. The remaining types of component (pumping plant, water mains, water treatment works, river intakes, and service storage) are given, where relevant, installed capacities or diameters, operating cost functions, capital cost estimates for new works, mains length, and so on. These input specifications, together with the list of available routes, represent the particular water supply system being modelled.

5. A route may be defined as a sequential series of components (usually source, pump, main, treatment works, main, demand district) which can transmit water from a resource to a demand. All existing and potential feasible routes which are or may be used in the system must be defined in a separate

input file, and it is usual that constraints placed on the route file govern the modelling. RACS cannot invent routes which have not been made available in this file, and it follows that the optimisation analysis can therefore only take place on the routes which are open in a particular modelling strategy. Kent RACS uses a possible total of 226 such routes, each of which may have one or both of the following constraints:

- (a) dates before and after which the routes cannot be used; and
- (b) maximum permissible average and peak flows.

6. Sources are allocated to average demands by least costs based on transshipment unit costs, by summing the costs at all components along the route, for individual years. The modeller tries to ensure that the model does not select as part of a solution short-term switching between routes to take advantage of temporary low transshipment costs, so that a sensibly consistent pattern of route flows occurs throughout the planning period. The allocation is then repeated to produce the annual pattern of peak route flows. By summing flows in components which appear in more than one route, average and peak flows through each individual system component are also calculated. The model therefore attempts to satisfy all demands in the cheapest way, according to the particular constraints imposed by that strategy, until all demands are satisfied or surplus resources are no longer available. The number of iterations may be specified. This method is not able to ensure automatically that all demands will be satisfied. There is no guarantee that an absolute least cost solution will be achieved over the whole planning period. The problem is overcome by careful inspection of results, comparison between runs and sensitivity analysis.

7. Each component is then costed in turn according to the flows for that year, and allowing for the difference (if any) between the modelled flows and the component's current installed capacity. Running or operating costs are calculated on the pattern of average flows, according to cost functions supplied by the operating authority, which are based on recent experience. The timing and sizing of new works are determined from the peak flows, and capital costs are derived (with a few minor exceptions) from engineering estimates. Provision is included in the programs for staging of works where this is found to be economical. All cost results are presented in both real and present value terms, based on the 5 per cent test discount rate as recommended in SWA's 'Manual of Project Appraisal', although alternatives can be tested.

Source: SWA.

APPENDIX 10.2

(referred to in paragraph 10.15)

Kent RACS study

1. The impetus for a strategic model of the water supply system for the major part of Kent arose from a recommendation to the Kent Resources Steering Committee in May 1981. The Resource Allocation and Costing System had previously been used successfully in other areas such as Hampshire and East Sussex, but the model proposed for Kent was the largest application undertaken by SWA. The purpose of the study was to assist in the resolution of a series of forthcoming water resource problems, particularly the development of the Medway Scheme, the place in a regional strategy of Broad Oak Reservoir, and the medium-term supply problems of both East Kent Water and Drainage Division (EKWDD) (now the Thanet area of Kent Division) and Folkestone.

2. It was decided that the model should encompass the water supply functions of the Kent River and Water Division (KRWD) (now the Medway area of Kent Division) and the EKWDD of SWA, together with Mid Kent and West Kent.

3. From the first, it was recognised that, because of the common problems relating to the Folkestone and the catchment link between the Medway and the Rother, the Kent RACS model would need to be run in conjunction with an updated version of the Rother-Folkestone RACS model. The common planning horizon should be 2011, and the common cost base 1981 Q1. The Kent RACS model was initially developed and tested on 1980 series demand forecasts, then both models were transferred to the 1982 series.

4. The results of the exercise were presented in three volumes:

- Volume 1 Mid-Range Demand Forecasts
- Volume 2 Upper Variant Demand Forecasts
- Volume 3 Sensitivity Studies.

Volume 1 also contains a detailed explanation of the significant features of the model and its underlying assumptions, and a fuller survey of some of the implications of the results. SWA emphasised that RACS studies have never been intended to include recommendations on a preferred strategy (since RACS is merely an aid to assist in making decisions) but rather to present and explain a factual analysis.

5. The data for the model comprised:

- (a) demand forecasts (including leakage targets) disaggregated to 35 local demand centres;
- (b) yields of existing and proposed sources during 1:50 year drought; and
- (c) system definition, including all possible alternative sources and trunk routes (nearly 500 components are modelled in the Kent and Rother-Folkestone RACS study).

6. The results of the study were presented in three standard tables:
- (a) the flows in Ml/d (average and peak) for each year along key trunk mains and at key sources;
 - (b) capital costs incurred in mains, sources, treatment works, pumps, service reservoirs etc required to meet demand; and
 - (c) operating costs at each source, pump, treatment works etc over the planning period.

7. Four general strategies were investigated:

- (a) separate development of Medway Schemes and Broad Oak Reservoir;
- (b) postponing Broad Oak Reservoir by diverting Medway water eastwards;
- (c) postponing Medway Schemes by diverting Broad Oak water westwards; and
- (d) not building Broad Oak Reservoir in the planning period to 2011.

8. A variety of tactical variations on each strategy were investigated, eg only achieving 50 per cent of hoped for groundwater yield. Sensitivity studies were carried out with regard to a variety of assumptions, eg alternative discount rates, cost variations at major components, variations in yields and peak week factors.

9. As part of a divisional exercise on the unit cost of waste saving, KRWD requested that a brief analysis be made using the RACS model of the cost penalty of not achieving any leakage savings throughout the planning period. The mid-range demand forecasts (average day) for KRWD, as given in the 1982 Annual Plan, rises by the year 2011 to 240.6 Ml/d with no leakage savings, and to 223.5 Ml/d assuming a 75 per cent achievement of the target reduction in leakage. The saving of 17.1 Ml/d attributable to leakage reduction measures is equivalent to a *per capita* saving of 38.3 litres/head/day.

10. The effects on the Base Model strategy of not achieving any leakage reductions are extremely significant. Large increases in surface water pumping are evident, and the dates of the Medway Scheme stages are brought forward in time by three or four years (the first component by four years to 1990). Peak outputs from Burham WTW reach 183 Ml/d, and the first extension is brought forward by five years to 1988. The effect on present value costs was estimated as follows (all costs being attributable to KRWD):

	<i>PV cost increase</i> £ million
Medway Scheme capital costs	2.245
Burham WTW and other capital costs	2.713
Surface water operating costs	5.445

thus implying that the achievement of leakage reductions amounting to 17.1 Ml/d or 38.3 l/h/d is worth £10.4 million over the planning period. This is equivalent to an average cost penalty of 5.4 pence/m³. This apparent unit cost of 5.4 pence/m³ is not the true value of leakage saving measures, because the input operating costs exclude the major element of labour, and because the

RACS model takes no account of the distribution system: the true unit cost is likely to be considerably higher.

11. The conclusion of the Kent RACS study was that the preferred strategy would be to divert Medway water eastward and to postpone Broad Oak. In total system costs this is 2.5 per cent more expensive than the cheapest strategy (no Broad Oak at any time), but gives greater operational security, can easily meet an unexpected high demand and has the cheapest operating costs.

Source: SWA.

APPENDIX 10.3
(referred to in paragraph 10.18)

Forms for use in the control of capital expenditure by SWA

The forms to be used and their functions are listed below.

<i>Form</i>	<i>Function</i>
<i>Stage 1: Initiation</i>	
CP11	Proposal to include capital project in five year programme
CP12	Application to commence project appraisal
CP13	Approval of project appraisal specification
<i>Stage 2: Project Appraisal and Outline Design</i>	
CP21	Application for outline approval
LDW 1	Application for outline approval (land drainage)
CP22	Outline approval
<i>Stage 3: Detailed Design and Tendering</i>	
CP31	Proposal for acceptance of tender
CP32	Request for contract documents to be signed*
CP33	Request for financial references*
CP35	Final acceptance of tender—permission to proceed
CP36	Confirmation of completion of contract documents
<i>Stage 4: Construction</i>	
CP41	Application for variation of project
CP42	Approval of variation
<i>Stage 5: Post Completion Appraisal</i>	
CP51	Notification of final account for completion
CP53	Final comparison between approved and actual costs
CP54	Post completion project appraisal

Source: SWA.

* Headquarters' internal use only.