

APPENDIX 1

PER CAPITA CONSUMPTION (PCC)

The following analysis supports some of Steventon Parish Council's main concerns with Thames Water's rev.dWRMP which are outlined in the representation. It addresses some of the major questions that have been raised on this subject.

OFWAT gave the following figures for Thames Water in its report ([Service and delivery – performance of the water companies in England and Wales 2008-09 report + Supporting information](#)).

Unmetered properties – water delivered 185.6 l/h/d and PCC (excl leakage) 156.8 l/h/d (2006/7)

	189.0	162.6
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(2008/9)

Metered properties – water delivered 153.4 l/h/d and PCC (excl leakage) 142.7 l/h/d (2006/7)

	151.6	142.1
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(2008/9)

These concepts are much easier for us to understand than the component data provided in the rev. dWRMP – the water delivered is the amount that passes through the company shut off valve for that property and the PCC is the amount actually used by the customer.

Thames Water's rev.dWRMP - Vol. 3 Appendix B 1.4.1-3 pages 13 & 14

Currently approx 77% of Thames Water's domestic customers have an unmetered supply. Results, from a sample of only 1500 of these customers (0.06%) have been extrapolated to all of Thames Water's 2.40 million unmetered domestic customers (OFWAT report 2008/9). For metered domestic properties the extrapolation is 3000 (0.35%) to 860,000 domestic customers. As metered customers are charged by the amount of water used it should not be necessary to carry out any extrapolation as accurate information could be obtained from the bills sent out to customers. If these estimates of PCC are used to estimate customer side leakage too then all of the figures become highly suspect.

Thames Water rev.dWRMP – Vol 2 page 55 . Outdoor use increasing from 15 l/h/d to 18.08 l/h/d by 2034 is also difficult to accept. Many of the low cost houses envisaged in the Government's future housing plans will be flats and have no gardens so they are unlikely to use much water outdoors. Similarly the increasing use of water butts should decrease the water use for gardens too. A 200 litre water butt can yield more than 600 l throughout a growing season. We therefore consider a 20% increase in outdoor use by 2034 to be unlikely. We also have difficulty in accepting Thames Water's current outdoor use as it seems high compared to the figures of other water companies such as Three Valleys Water.

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“There is no real scientific basis for selecting a value of 130 l/h/d (for the PCC). It has not been based on a bottom-up calculation of potential interventions. It is a pragmatic figure based on benchmarking PCC across Europe.”

The PCC figures below (from the OFWAT report 2008/9 Supporting Information p 47) show that half of the water companies already have metered PCC down to Defra's 2030 expected level of 130 l/h/d. It therefore seems totally reasonable to assume that the Defra

2030 aspiration is achievable, particularly as the percentage of properties with meters increases and newer build will have lower water consumption mandatory. The quote above seems to imply that bottom-up guesstimates are more scientifically sound than the evidence in the OFWAT report, we doubt the validity of this implication.

This again emphasises the need for Thames Water to make a sustained effort to meter a much greater percentage of customers and have more reliable estimates of actual customer use and leakage in order to justify its future PCC estimates.

Per capita water consumption excluding supply pipe leakage. Ex OFWAT report 2008/9	Metered domestic	l/h/d	Un-metered domestic	l/h/d
	United Utilities	111.6	Tendring	132.4
	Severn Trent	111.8	Severn Trent	135.0
	Tendring	112.6	Northumbrian N	141.7
	Yorkshire	113.8	United Utilities	143.5
	Bristol	122.6	Cambridge	146.0
	Dwr Cymru	124.2	Dee Valley (Chester +	
	South Staffs	124.7	Wessex	147.7
	South West	126.8	Yorkshire	148.2
	Portsmouth	128.0	Southern	149.3
	Cambridge	128.4	South West	151.7
	Northumbrian N	129.5	Bournemouth	156.0
	Dee Valley (Chester +		Wrexham)	156.6
	Wrexham)	134.6	Anglian	157.6
	Folkestone	134.6	Bristol	158.9
	Wessex	135.5	Dwr Cymru	160.1
	Southern	136.8	Thames	162.6
	Sutton	137.2	Northumbrian S	163.4
	Anglian	139.1	Portsmouth	164.7
	Three Valleys	141.6	South Staffs	168.5
	Thames	142.1	Folkestone	169.4
	Northumbrian S	147.0	Sutton	170.1
	Bournemouth	154.2	Three Valleys	175.3
	South East	157.5	South East	177.3

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This section gives details of toilet flush volumes and it is clear that every person using a toilet with a 13.75l flush volume rather than a 4.7l flush volume is using an extra 42.08l/d per day. If 3% of the Thames Water customers are doing so then the extra water used by this alone comes to 10.8 Ml/d $((13.75 - 4.7) \times 4.65 \times 0.03 \times 8.56M)$. If Thames Water were to contribute £60 towards the cost of replacing these with modern ones the capital cost to Thames Water would be about £6.07M $(0.03 \times 3.428M \times 60)$ or £0.58M/Ml/d and there would be zero future costs, this should be compared to their proposed reservoir which is likely to have a capital cost of at least £4.1M/Ml/d and perpetual running costs. However if the old cisterns were replaced Thames Water would then make saving of £2.8M per annum in reduced processing costs for drinking water and sewage treatment $(10.8 \times 365.25 \times (0.428 + 0.273)/1000)$ thereby paying for the investment in only three years.

Similarly for those 48% with a 9.25l flush the saving could be 86.9 Ml/d $((9.25 - 4.7) \times 4.65 \times 0.48 \times 8.56M)$. With the same £60 donation the cost to the company would be about

£98.7M (0.48 x 3.428M x 60) or £1.14M/MI/d which would also be substantially cheaper than water from the proposed reservoir even if it operated at maximum designed capacity continuously. Thames Water would recover this expenditure in cost savings of £22.5M on sewage treatment, recovering their capital costs in just over 4 years. There are a number of options on this theme, increasing the cost to Thames Water and hence reducing the cost to homeowners or combining this with spray tap installation and other PCC lowering technology. These technology water savings would also be permanent until the hardware is changed.

Alternatively the UK Green Building Council has proposed a 'Pay as you save' (PAYS) mechanism whereby householders obtain loans for green refurbishments with repayments spread over 25 years so that the cost would always be less than the amount saved through reduced fuel bills. The Parish Council see no reason why Thames Water could not offer a similar sort of scheme for householders fitting modern cisterns, spray taps and other water saving technology with a shorter repayment period.

Thames Water does not appear to have considered these options even though they could save at least 109 MI/d and repay the capital investment quickly while saving customers money.

These costs should be compared with those in Vol 3 Table D12 page 145 for Domestic Self Audit Packs costing £6.875M to save 2.55MI/d i.e. £2.7M/MI/d which Thames Water is proposing to send out.

With 24% of domestic consumption being estimated as toilet use and 24% estimated as tap use Thames Water's one line statement that. "replacing toilets is not cost beneficial" (V3 app F page 186) is not good enough when subsidies could be offered cheaply. The amount of water in question is potentially large as household customers have approximately 1461.3 MI/d water delivered, cistern changing alone could yield savings of up to 109 MI/d, which seems to be more than the amount of water (58 MI/d) estimated to be utilised from the proposed reservoir in 2035.

Thames Water rev.dWRMP Vol. 3 B.4.4.2 page 44 Baths & Showers.

Thames Water predicts that the frequency of baths and showers will rise to between 6.73 & 6.82 per person per week in the next 30 years. We suggest that the Thames Water estimates result from extrapolation of non-typical data, as this implies that an average of 97% of the population will have a bath or shower in their own home every single day of the year and does not factor in holidays and other absences.

Thames Water rev.dWRMP Vol 3 Fig. B8 page 59 Microcomponent growth curve.
The increase in shower usage from about 27 l/h/d to 51 l/h/d by 2034/5 coupled with a decrease in bath usage from about 18 l/h/d to 10 l/h/d seems to be excessive and requires further justification.

Thames Water rev.dWRMP Vol. 3 Table 4 B4.4.3 page 37 Washing Machines
The assumed life of these machines seems to be over-generous. The assumption results in greater future water consumption as less efficient machines are predicted to last longer than we would expect. We would therefore expect this microcomponent to decrease more.

Thames Water rev.dWRMP Vol. 3 B4.4.9 page 52 Outdoor use
Garden watering – 2003 data used because results gathered in 2007 survey "appeared to be too low". Local observations suggest that there has been a decrease in lawn watering since

2003, brown lawns have become more acceptable and common as people realise that brown lawns do not have to be mown and that they recover when it rains. This use of old data is suspect in that it appears to be selected to justify predictions of higher future consumption. The cost of metered water should deter many more people from watering their lawns. A cost increase of 30% in motoring fuel a year ago appeared to have driven a 30% decrease in fuel consumption, it is therefore reasonable to assume that a similar effect would be noticed if high water consumption users were metered and faced with having to pay for each cubic meter used.

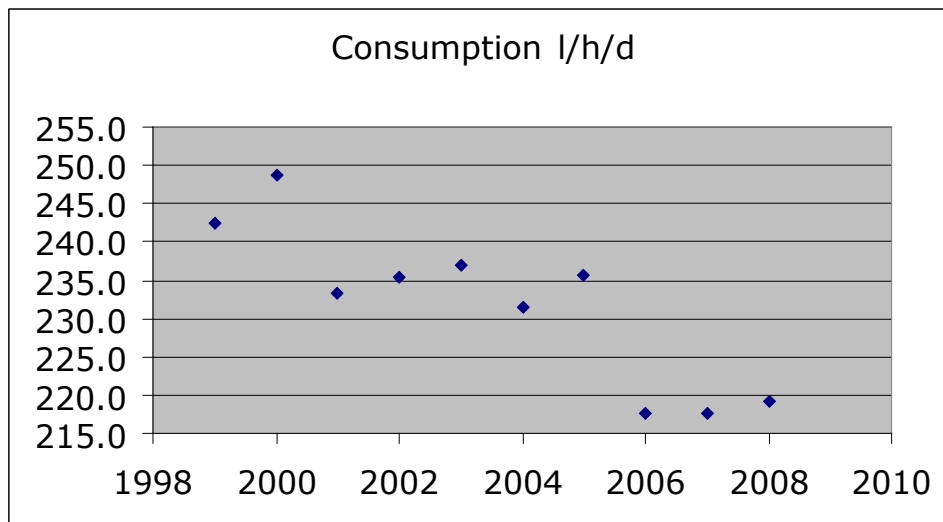
Thames Water rev.dWRMP Vol3 B4.4.9 page 53 The ownership of hosepipes and sprinklers is predicted to grow at a rate of 0.5% per year. That is approximately the predicted rate of population growth, which has already been allowed for elsewhere in the future demand figures. Also much of the low cost housing predicted for this region will not actually have a garden to water so this projected increase seems pessimistic.

Thames Water rev.dWRMP Vol. 3 B4.4. page 60

Thames Water is predicting that personal cleansing will increase to 36% (unmetered households) and 37.5% (metered) of per capita consumption by 2034/5. We are not sure why unmetered households, which consume more water per capita, have a lower percentage use for personal cleansing. As no explanation is given for this extra water use it is not clear if this extra use is actually just increased leakage. The pie charts do not appear to be consistent with the numbers given.

The table below, which has been produced from data in past OFWAT reports, does not provide any convincing evidence for any increase in water use between 1999 and 2009. Similarly the graph may be taken as showing a decrease in water use (the water used per head of the population is not PCC as the water used includes non-domestic use). What we have called the Water Used is the difference between the distribution input and the leakage.

Year	Distribution input MI/d	Leakage MI/d	Used MI/d	Household population M	Water used per head of population l/h/d
99/0	2553	662	1891	7.517	242.4
00/1	2640	688	1952	7.536	248.6
01/2	2765	865	1900	7.815	233.3
02/3	2804	925	1879	7.676	235.3
03/4	2874	946	1928	7.830	236.9
04/5	2809	914	1895	7.873	231.6
05/6	2801	862	1938	7.919	235.5
06/7	2643	790	1853	8.120	217.7
07/8	2572	713.2	1858.8	8.131	217.6
08/9	2573.7	698.4	1875.3	8.131	219.1



Thames Water rev.dWRMP – Vol 3 N 7.4. page 462. “The revised PCC profile over the planning period is now consistent with Defra’s aspirational target of 130 l/p/d by 2025” We do not understand how Thames Water can make this claim when on page 460 Figure N 19 their predicted PCC seems to be around 135 l/p/d in 2034, unless they are of the opinion that enough other water companies will have PCCs below 130 l/h/d to ensure that the industry average will be below 130 l/h/d even if the Thames Water PCC is 135 l/h/d..

We regard it as Thames Water’s responsibility to ensure that the 130 l/h/d PCC is achieved. A combination of increased metering, tariff incentives, encouragement/education and a PAYS scheme for water efficient plumbing installation appears to us to be comfortably able to deliver that. Having microcomponents for personal cleansing and outdoor use that were more believable would also assist with this.