APPENDIX 2

LEAKAGE

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.

The following figures were obtained from the OFWAT Report 2008-9 on the 22 water companies.

Total leakage in m^3/km/d - the best were	Dee Valley	5.3
	South West Water	5.6
	Anglian	5.6
	Tendring Hundred	5.6
	Cambridge	6.0
	Southern	6.4
- the worst were	Severn Trent	10.5
	United Utilities	10.9
	South Staffs	12.5
	Thames Water	**22.2**

Industry numerical average excluding Thames Water = 7.73 m^3/km/d.

Total leakage in l/prop/d – the best were	Tendring Hundred	70.0
	Southern	82.8
	Northumbrian S	85.6
	Dee Valley	85.4
	Sutton	88.4
- the worst were	Dwr Cymru	141.6
	Severn Trent	143.9
	United Utilities	145.0
	Thames Water	**195.3**

Industry numerical average excluding Thames Water = 110.6 l/prop/d

If the leakage in litres/km/d is divided by the leakage in l/prop/day it gives the following number of properties per kilometre –

	Tendring Hundred	80.0
	Southern	77.3
	Northumbrian S	90.0
	Dee Valley	62.1
	Sutton	80.3

Average of the low leakage water companies = 77.9 properties/km

	Dwr Cymru	50.8
	Severn Trent	73.0
	United Utilities	75.2
	Thames Water	**113.9**

Average of the high leakage water companies = 78.2 properties/km.

Clearly if the difference in the number of properties/km has an effect on the total leakage, that effect is dwarfed by other factors.

Thames Water's rev dWRMP Vol 3 C.5.a page 100 We note the following statement – "Required to meet company strategic direction to reduce leakage to the industry average over a 10 year period." The industry numerical average leakage rate is 7.73 m^3/km/d excluding Thames Water (for Thames Water to equal the average their leakage rate must equal the average of all the other water companies) so if Thames Water achieved the industry average leakage rate the leakage would decrease from 700 Ml/d to 244 Ml/d (700 x 7.73/22.2). However if the same calculation is carried out using leakage in l/prop/d (industry numerical average excluding Thames Water is 110.6 l/prop/d) the leakage would decrease from 700 Ml/d to 396 Ml/d (700 x 110.6/195.3). Comparing leakage rates by other methods such as weighted mean would not be acceptable as it would skew the mean in favour of the large companies where the major problems lie and where there is the greatest need to address the problems. If the weighted mean excluding Thames Water were to be used it would still only be 122 l/p/d at present (equivalent to 437 Ml/d for Thames Water) and likely to fall as the other companies are planning to reduce leakage in the future. However further down this page Thames Water appears to be planning to reduce the leakage rate to only 514 Ml/d by 2034/5. This does not seem to be consistent with the company strategic direction.

Thames Water's rev dWRMP Vol 3 C page 74. "…..burst rates fall considerably on the new network, although not to zero, (77% reduction of mains repairs, 55% reduction of communication pipe repairs and 62% reduction of stop tap *(repairs?)*".
"Currently we detect and repair between 70,000 and 80,000 leaks per annum with an estimated leakage benefit well in excess of 800 Ml/d." The Parish Council considers these to be compelling reasons for the total replacement of entire DMAs with a bursting/leakage problem.

Thames Water's rev dWRMP - Vol. 2 page 135 Rate and cost of replacement.
"Actual costs are 18% lower than the SBP forecast and very close to the Final Determination of approximately £443/m (at 06/07 prices). The 'low' cost reflects efficiency improvements, more aggressive contractor pricing and the economies of scale being realised by the larger programme."
In view of the leakage rates on the replaced mains we are concerned that that these "efficiency improvements" may have occurred as a consequence of either (a) setting non-challenging leakage targets, (b) reduced training of the workmen carrying out the replacement or (c) insufficient supervision of workmen, in an attempt to increase profits.

Thames Water's revdWRMP - Vol3 C.1. page73 & 74
"Typical average industry leakage levels for networks in good condition are 35 l/p/d company-side and 23 l/p/d on the customer-side."
"Results from the Thames Water DMAs are 29.1 l/p/d on the company side where full DMA replacement has been undertaken." "Current customer side residual leakage levels are estimated to be 30.1 l/p/d where full replacement has been undertaken."
We would expect a new modern plastic mains system to have less than half the leakage of the best existing system, and considerably better than industry average particularly as

Thames Water has data loggers ('Leakfrogs') that would detect and quantify customer side leakage. Given the leakage rate of the replaced DMA networks of 59.2 l/p/d compared to the typical industry average for existing mains of 58 l/p/d we hope that the regulator (OFWAT) will investigate this and set more challenging leakage targets for all mains replacement.

Thames Water's revdWRMP - Vol. 2 page 134 Water savings to date.
"For full DMA replacement Thames Water side leakage savings are in line with WRP04 assumptions, with an overall saving of 0.109 Ml/km/d of main laid". This is equivalent to 109 cu m/km/d.
"Follow up work in three District Metering Areas is being undertaken when residual leakage on the Thames side of the network is higher than the threshold" (35 l/prop/d which is the industry standard for mains in "good" condition).

In view of the water stress in the region we do not consider it appropriate for Thames Water to set a non-challenging standard for new mains that is no better than the industry standard for existing networks "in good condition"

Thames Water's revdWRMP - Vol. 2 page 135 Ongoing performance.
"Latest data analysed from this last winter (2008/9) also suggests that the new network shows almost no response to weather conditions. This is in stark contrast to the existing network, which has shown a large increase in bursts in response to this winter's cold temperatures."
We suggest that this is a compelling reason to concentrate on replacing the old mains at maximum possible speed. It also raises the questions of the cost and water savings resulting from fewer leaks and the cost saving made by better leakage detection and repair and how much impact these have on the true value and cost of the mains replacements. We do not believe that Thames Water has adequately addressed these benefits in this revised dWRMP even though the magnitude of the benefits could greatly influence OFWAT's position on mains replacement as a means to reduce demand.

Thames Waters rev dWRMP - Vol. 2 page 142 "Where there are new housing developments in our supply area we assume that these new properties will result in an additional 46 l/p/d of leakage". This appears very high; we strongly suggest that Thames Water should specify low limits for leakage to new house builders as a condition for connection to the mains. This could be enforced by monitoring the leakage before the new residents move in by using the meters and "Leakfrogs". Thames Water is expecting 885,000 new properties by 2034 (Vol 2 Table3.4 page 44) so if that turns out to be correct, halving the 46 l/prop/d would result in saving 20 Ml/d by 2034.

Thames Water's rev dWRMP Vol 3 Table C14 page 100. We consider the proposed reduction of leakage in London to 394 Ml/d by 2024/5 (plus 120 Ml/d for the Thames Valley, giving a total of 514 Ml/d) to be a step in the right direction but it would still result in Thames Water being bottom of the league both for leakage in cu m/km/d and l/prop/d by significant margins even if the other water companies did not improve their performance in that time. With the uncertainty of climate change excessive leakage of a valuable and limited resource is unacceptable and we strongly recommend that the proposed leakage level in London should be reduced substantially.

Assuming that the proposed reservoir will have a capital (NPV) cost of £0.813B and a yield of 198 Ml/d (Vol 2 page 219) that gives a capital cost of about £4.1M/Ml/d and there would be ongoing environmental, social and financial costs. This cost should be comparable to the cost for saving water by replacing water mains (£442/m saving 0.109 Ml/d = £4.05M/Ml/d Vol 2 pages 134-5) bearing in mind that the mains replacement would also reduce the number of water leaks and bursts that Thames Water had to repair and hence the repair costs. Replacing the old water mains therefore seems a more sensible option than a reservoir.

As old crumbling water mains are assets that need to be replaced it is difficult for us to understand why disruption costs are considered when determining the Economic Level of Leakage (ELL) (OFWAT report 1999/2000 p17) and considering the replacement of Victorian Mains as a means to reduce leakage.