

# Saving Water in Crawley's Hospitality Sector

A report for SEEDA under the BREW project • Oct 2007

**ech<sub>2</sub>o**  
environmental consultants





## Report written by Cath Hassell

With thanks to the following:

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Thaddeus Dell	Crawley Council

All the owners and staff of the premises within Crawley's hospitality sector where we undertook either a telephone survey or a site audit, and with special thanks to the 10 premises who agreed to have data loggers fitted to allow us to collect and analyse detailed information about how much water they use.

**This version of the report has been prepared in Oct 2007 to provide anonymity to all participating premises, whilst still highlighting the measures carried out and the water saved.** Premises were identified by type and given a unique number. They were also given a code relating to whether Crawley Council (T) or ech<sub>2</sub>o (E) or both (Z) had visited as part of the project. Premises that had urinal controls (U) or dataloggers (L) fitted as part of the project were further identified.

### Technical Notes.

On average in the UK it takes 1.2 kWh to supply 1m<sup>3</sup> of potable water into a building and to treat the corresponding waste water. A figure of 0.45 kgCO<sub>2</sub>/kWh was used to calculate CO<sub>2</sub> savings from water saved. These savings are for cold water only and do not take into account any CO<sub>2</sub> savings arising from not having to heat hot water, as most savings in this project were cold water. Since April 2007 DEFRA have increased the amount of CO<sub>2</sub> emitted from the production of 1 kWh of electricity to 0.527kgCO<sub>2</sub>/kWh. Therefore ongoing carbon savings per year will be greater than calculated by a factor of 15%.

Small water savings are shown in litres. Large water savings are shown in m<sup>3</sup>. There are 1000 litres in 1 m<sup>3</sup> of water.

Water costs in the Crawley area are amongst the lowest in the country. Most premises have mains water supplied by Southern Water and waste water treated by Thames Water. The 2007/08 combined cost was estimated at £1.40 per m<sup>3</sup>. Monetary savings from the measures detailed in this report will be higher in most areas of the UK.

Project number: EISD/SEPT/2006/21

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**ech<sub>2</sub>o** is an environmental consultancy offering design advice and seminars on all aspects of sustainable water use, low carbon energy systems, carbon literacy and environmental choice of materials.

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## 1. Executive Summary

- The “Saving Water in Crawley’s Hospitality Sector Project” was funded by SEEDA as part of the BREW project.
- The project’s main remit was to audit for and provide water conservation and efficiency measures within premises in Crawley’s hospitality sector.
- Crawley Council had visited 24 premises within the hospitality sector in the summer of 2006, gave recommendations for water saving measures and estimated this would result in 1,750m<sup>3</sup> of water saved per year.
- The project found that take up of water efficiency measures were much lower than the Council expected. Four premises were “in the process of installing urinal controls”. Two premises had fitted Save-a-flush bags. Actual yearly savings will be 453m<sup>3</sup> of water at best, 18.8m<sup>3</sup> of water per premises per year.
- ech<sub>2</sub>o carried out detailed water audits of 40 further premises within Crawley’s hospitality sector and implemented water efficiency measures in suitable premises. The ech<sub>2</sub>o project results were:
  - 10 sites logged providing valuable data of water use over the next two years.
  - 101 Save-a-flush bags fitted (39% of WCs), saving 1,146m<sup>3</sup> per year.
  - 20 urinal controls installed controlling 63 urinal spaces, saving 2,558 m<sup>3</sup> per year.
  - Excessive flow rates from taps adjusted in 30 premises, saving 1,092m<sup>3</sup> per year.
  - Identified 3 major leaks, saving 269m<sup>3</sup>.
  - Total water savings from ech<sub>2</sub>o’s work carried out under the BREW project across 43<sup>1</sup> premises are 5,065m<sup>3</sup> per year.
  - Average saving is 118m<sup>3</sup> of water per premises per year.
  - **5,065m<sup>3</sup> of water saved is 6,078 kWh of energy saved resulting in 2,735 kg of CO<sub>2</sub> not emitted**

## 2 Introduction

- Crawley is the hub of one of the most dynamic economies in the country and has a thriving local economy that is widely considered the driver of West Sussex economic growth. It is a growing town of over 100,000 people with a significant population rise during commercial hours. As such, there is a large demand on the existing water supply resources.
- Crawley receives its water supply from Weirwood reservoir, the river Rother and from several boreholes in the area. In the summer of 2006 following two dry winters the supply was placed under acute pressure with reservoir levels low and the amount of water going to the river Rother reduced significantly via a drought order.



Figure 2.1 Weirwood reservoir. Summer 2006

- The council decided that whilst households were being urged to save water and were suffering from a hose pipe ban, hospitality businesses should address the profligate water use prevalent in their sector.
- Crawley Council identified 64 hospitality premises under their jurisdiction, comprising pubs, clubs, restaurants and takeaways.
- It was decided to visit these premises to identify areas where water efficiency measures could be implemented. 24 premises were originally visited by Thaddeus Dell of Crawley Council during summer 2006.
- The hospitality sector was also urged through various Council newsletters and articles in the local press to implement water efficiency (as well as energy efficiency) measures.

### 2.1 Intended outcomes

- Discussions were held between ech<sub>2</sub>o and Crawley Council to decide on core outcomes from the project. These were:
  - ~ to follow up the premises visited by the council to find out whether the recommendations for water efficiency had been followed
  - ~ to undertake a detailed audit of the 40 premises not already visited to ascertain/understand where and how water is used in the hospitality sector
  - ~ to fit urinal controls in 20 premises, therefore actually saving water

- ~ to fit data loggers to ten premises to get a more detailed understanding of where and when water is used in businesses in the hospitality sector
- ~ to raise the profile of saving water in Crawley by various types of publicity
- ~ to disseminate the knowledge gained to enable other local councils to know what worked and what didn't work.

### 3 Telephone survey of Crawley Council audited premises

- Crawley Council had visited 24 pubs and restaurants in the Crawley area during the summer of 2006. A variety of business types were visited as detailed in figure 3.1.

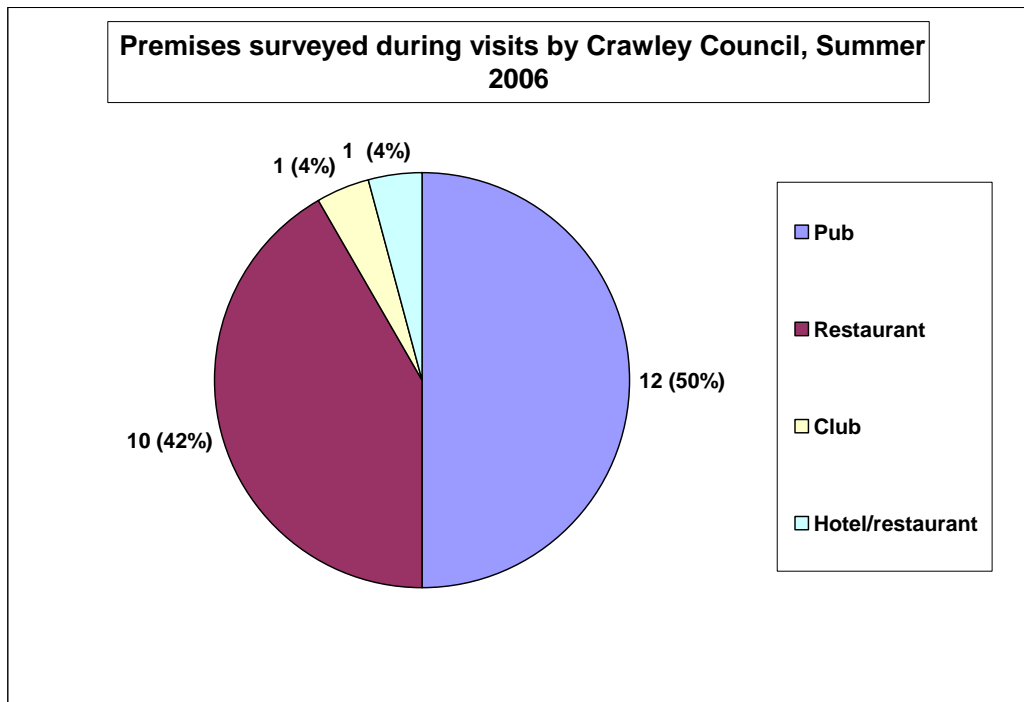


Figure 3.1

- The main remit from the telephone survey by ech<sub>2</sub>o in December 2006 was to find out whether the council recommendations had been carried out and therefore whether the estimated water savings had been realised.
- The surveys carried out by Crawley Council were brief and did not detail the number and type of appliances, nor how much water the premises could expect to save. The reports stated generic savings that could be realised from urinal controls and Save-a-flush bags rather than relating to the actual premises in terms of customer numbers and opening hours.
- ech<sub>2</sub>o therefore decided to audit how many WCs and urinals were fitted in each of the premises as this data had not been collected during the council audit.
- Out of the original 24 sites 19 sites eventually agreed to answer follow up questions.
- It proved difficult to persuade many of the premises to respond to the follow-up survey. Staff were busy and when the owner, or duty manager was not available other staff were reluctant to respond on their behalf. Furthermore, some premises were somewhat hostile to what they perceived as “further interference from the council”.
- Follow up calls were made to all premises until either the information was gained or it was apparent that no one would speak to us.

### 3.1 Council recommendations

- The council audit recommended various water efficiency measures as detailed in figure 3.2.
- It was suggested that these recommendations would result in 1,750,750 litres (1,750m<sup>3</sup>) of water saved per year.<sup>2</sup>

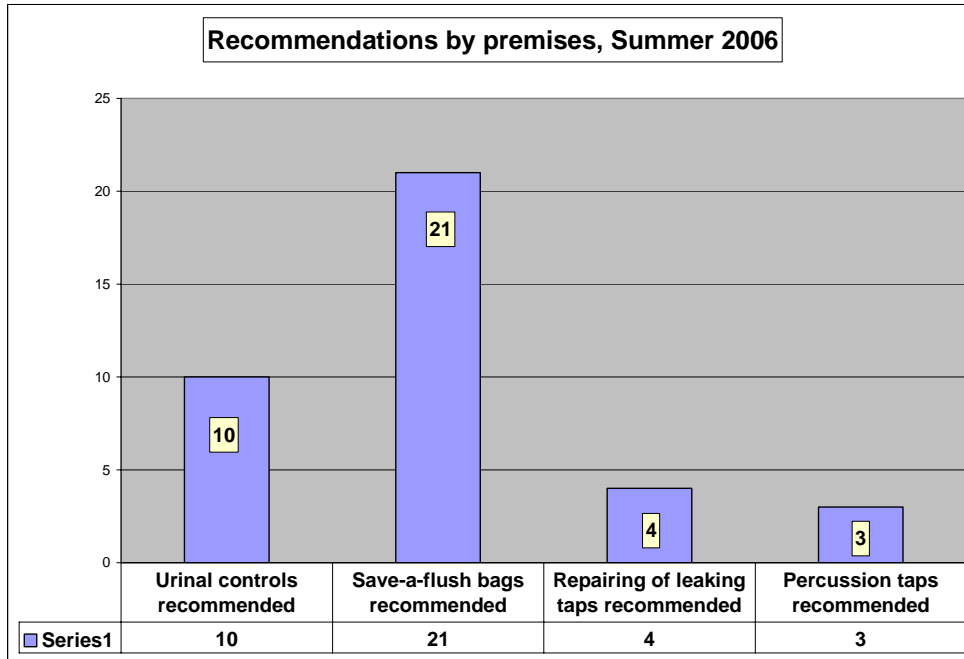


Figure 3.2

### 3.2 WCs

- Figure 3.3 shows the number of WCs in the premises surveyed by telephone.

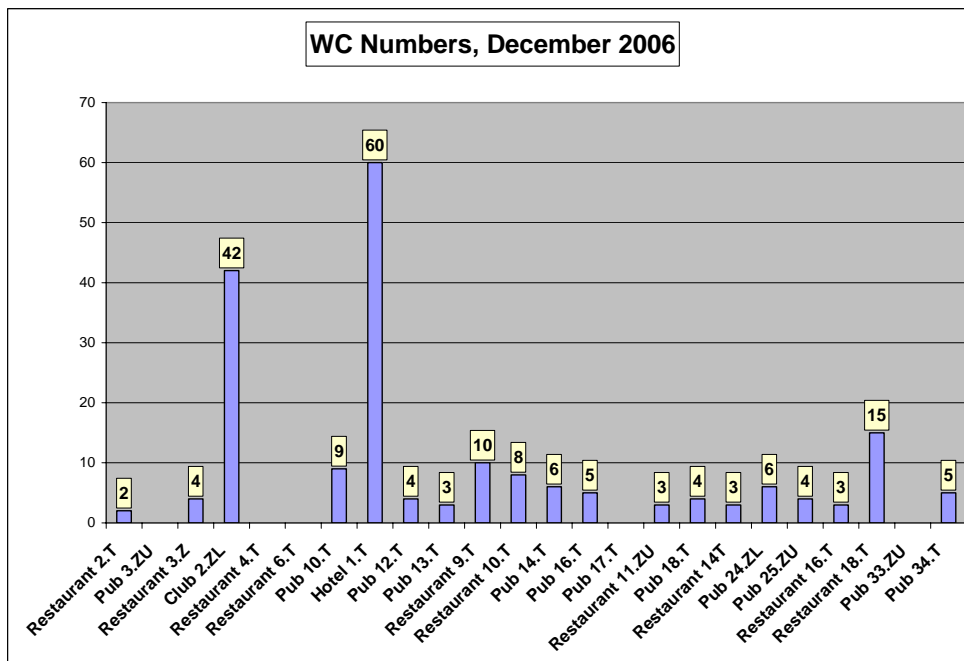


Figure 3.3 (Premises that show no WCs, did not respond to the telephone survey.)

### 3.3 Savings from WC flushing

- 21 out of the 24 sites visited by the council were advised to fit Save-a-flush bags. Save-a-flush bags are cistern displacement devices. They are essentially bags of silicone gel. Within 24 hours of being immersed in water, the silicone swells, and the bag displaces 1 litre of water when the cistern refills. The result is a 1 litre saving in water per flush. Save-a-flush bags were left in some of the premises. Where this was not possible a telephone ordering line number was left with the owner/duty manager.
- Three premises had no recommendation for Save-a-flush bags. There was no reference in the council letters as to why these premises did not need them and the council couldn't remember the specific details. The owners/managers of the premises did not know how many litres the WCs in these premises used per flush. We therefore assumed that the WCs had 6 litre flushing volumes and this was why no Save-a-flush bags had been recommended.
- In December 2006 only two sites out of the 19 surveyed had fitted Save-a-flush bags following the council's recommendations.
- Most of the respondees did not know what Save-a-flush bags were or how they worked. Once told how easy they are to fit and how they save water most said they would be interested in fitting them
- Pub 18T (four WCs), and Pub 24.ZL (six WCs) had fitted Save-a-flush bags following the council's recommendations.
- Looking at data from the premises audited by ech<sub>2</sub>o, it is possible to calculate potential savings. On average, a busy pub or restaurant could save between 40 to 50m<sup>3</sup> of water (£49.60 - £62)<sup>3</sup> yearly by fitting Save-a-flush bags. For an initial outlay of zero and less than 10 minutes fitting time for most WCs, savings per £ spent are very high.
- We therefore calculated that fitting Save-a-flush bags in these two premises will save 100m<sup>3</sup> of water a year.

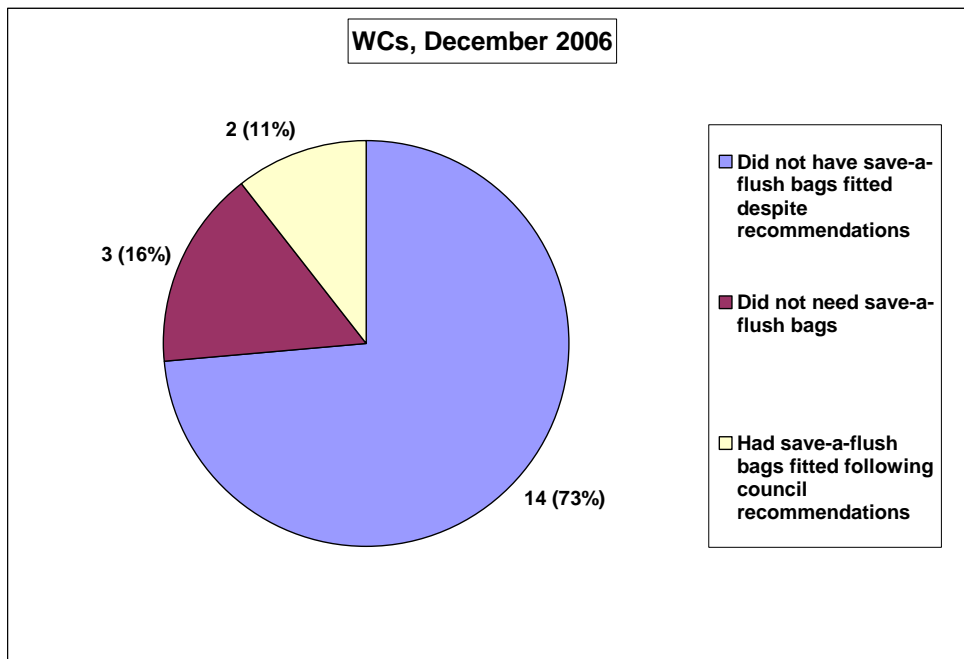


Figure 3.4

- At December 2006 there were 14 premises out of the 19 surveyed without Save-a-flush bags, even though they would benefit from them. It is clear that with further funding large amounts of water could be saved by installing Save-a-flush bags in these premises. Water savings would be particularly high in Club 2.ZL (42 WCs) and Hotel 1.T (62 WCs).

### 3.4 Urinals

- Figure 3.5 shows the number of urinals in the premises surveyed.
- All the 19 sites contacted by ech<sub>2</sub>o had at least one urinal.

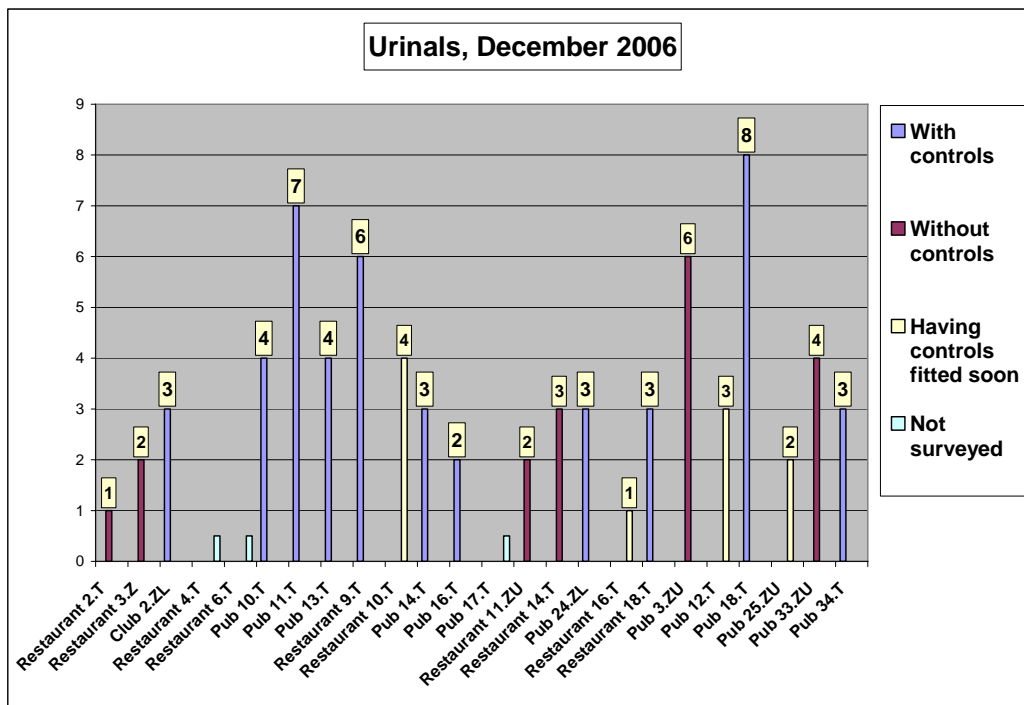


Figure 3.5

### 3.5 Savings from urinal flushing

- Out of 24 sites visited 10 were advised to have controls fitted. There was no information under the initial council survey as to whether the remaining 14 premises already had controls, or did not have urinals.
- Of the 19 sites contacted by phone, eight had been recommended to have controls fitted following the council audit. When surveyed in December 2006, four said they were in the process of getting controls fitted.

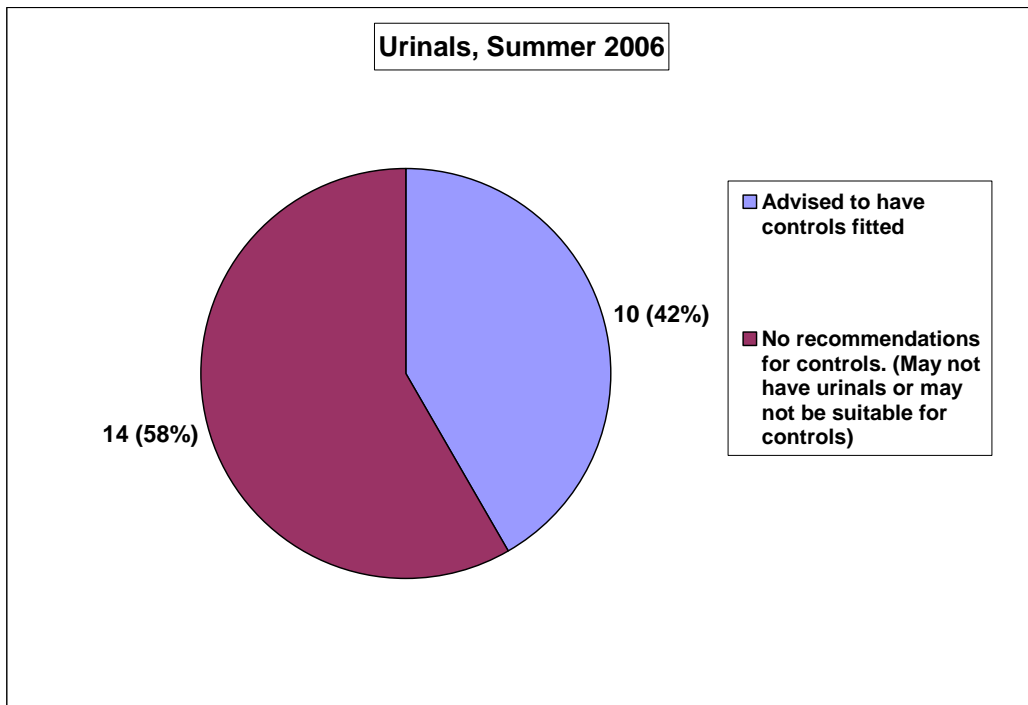


Figure 3.6

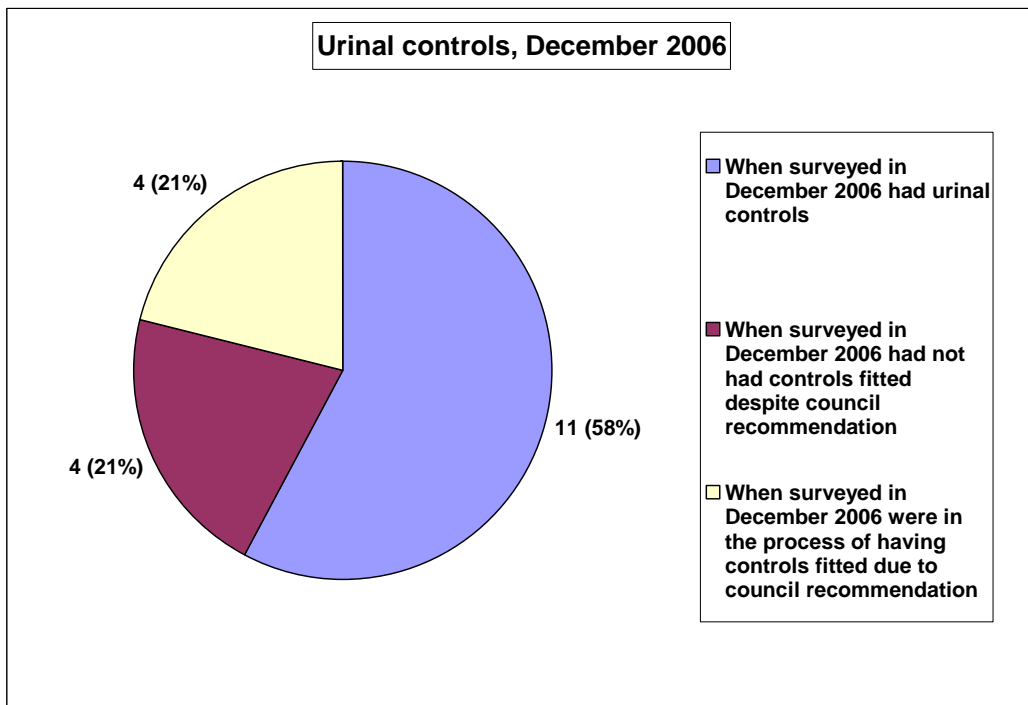


Figure 3.7

- There are 10 urinals in the four premises who told us they were “having controls fitted soon”.
- Three premises are pubs with two or more urinals fitted. Using a flushing volume of 7.5 litres per hour for all multiple urinals (as per Water Regulation recommendations), this is a total of 67.5 litres for flushing every hour. We have calculated an average shut down period of 12 hours. Therefore, the controls will save 810 litres per day, 5,670 litres per week and 294.8m<sup>3</sup> per year.

- One of these premises is a takeaway with one urinal. Using a flushing volume of 10 litres per hour for single urinals (as per Water Regulation recommendations) and assuming a shut down period of 15 hours, savings are calculated as 150 litres per day, 1,050 per week and 54.6m<sup>3</sup> per year.
- **Estimated total savings from urinal controls if fitted as stated will be 349.4m<sup>3</sup> per year.**
- It is important to note we were given no dates as to when the controls were to be fitted and no hard evidence as to how likely controls will be fitted. **In February 2007 no controls had been fitted and so actual savings from urinal controls were zero.**
- When surveyed in December 2006, four premises had not yet made any moves to get controls fitted. These were Restaurant 2.T, Restaurant 3.Z, Restaurant 11.ZU and Restaurant 14.T.
- In February 2007 these four premises were asked if they would like free urinal controls under the BREW project. Both Restaurant 11.ZU and Restaurant 3.Z said they would. Restaurant 14.T stated that they were a chain so were not interested and would need head office approval if they did want to get controls. Restaurant 2.T stated that they turn the urinal flushing mechanism system off when closed and were not interested in having controls fitted.
- Both Restaurant 11.ZU and Restaurant 3.Z could save an estimated 87.3 m<sup>3</sup> each if urinal controls were fitted. It was therefore decided to include these latter two premises in the project to fit free controls. We calculated these savings based on the actual shut down hours of the premises and the number of urinals they had.
- The end result was that only Restaurant 11.ZU had urinal controls fitted. The manager of Restaurant 3.Z wanted the controls but the owner would not give him permission to proceed. We were unable to speak to the owner to outline the benefits of fitting free urinal controls.

### 3.6 Taps

- During the initial surveys by the council no information about taps were noted although the letter did mention leaking taps or recommendations for percussion taps if this was noticed during the visit.
- All three sites with leaking taps were contacted during the telephone survey. Two sites reported the leak as having been fixed. One site reported that the leaking tap was no longer in use.

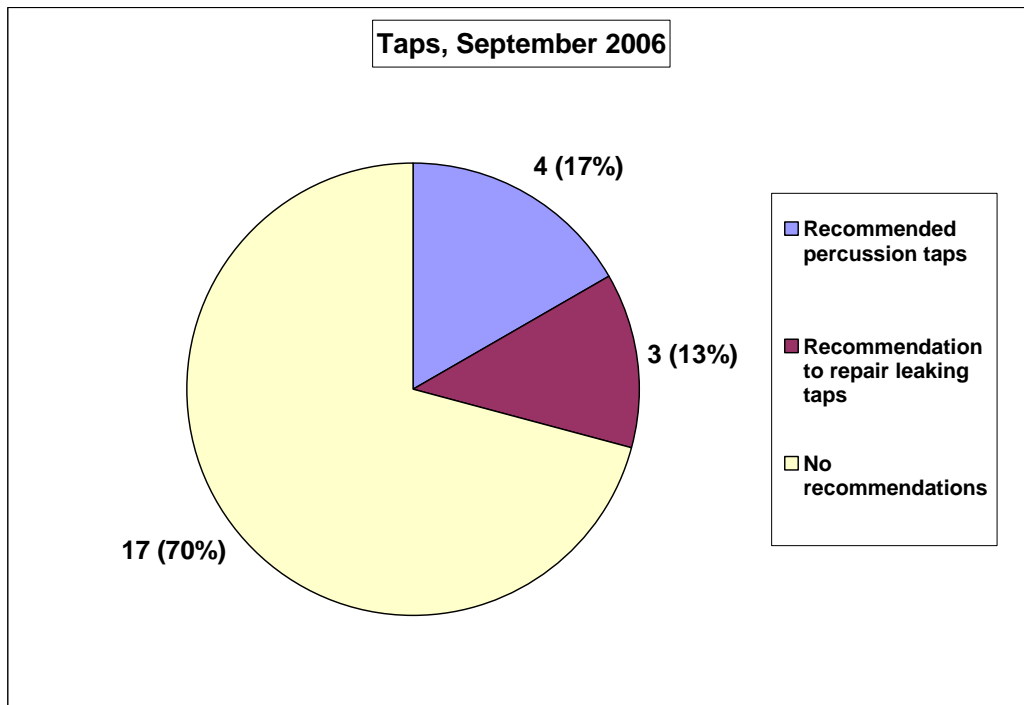


Figure 3.8

### 3.7 Conclusions from ech<sub>2</sub>o telephone survey

- The water audits carried out by Crawley Council were too generalised. Information about number and type of appliance was not collected. Estimated savings did not accurately reflect the differences in premises visited (in terms of customer numbers and shut down periods of the premises).
- Take up of water efficiency measures were disappointingly much lower than expected. Therefore predicted savings were over optimistic.
- Take up of recommendations to fit urinal controls was in the process of being followed in 50% of cases though no premises had actually fitted them.
- Feedback from these premises that they had had no time to either fit the Save-a-flush bags left on the premises by the council (or to call the free Save-a-flush bag hot line number) led ech<sub>2</sub>o to decide to take and fit Save-a-flush bags in all the premises they were to audit.
- It is important to encourage water efficiency rather than to force the issue.<sup>4</sup>
- During the telephone survey two premises (one a pub, one a club) were identified as potentially good sites to be logged and subsequently were.
- During the telephone survey ech<sub>2</sub>o identified premises that had not been fitted with urinal controls. One such premises was subsequently fitted with urinal controls saving 87m<sup>3</sup> of water a year.
- ech<sub>2</sub>o assumed that premises that were not willing to spend 10 minutes answering a telephone survey had not fitted either urinal controls or Save-a-flush bags.

- ech<sub>2</sub>o estimated actual yearly savings to be just 453m<sup>3</sup> of water at best.<sup>5</sup>
- **Across 24 premises the average saving is therefore just 18.8m<sup>3</sup> of water per premises per year**

#### 4. ech<sub>2</sub>o audit

- ech<sub>2</sub>o carried out detailed surveys of 40 hospitality premises in Crawley during the period December 2006 – March 2007. Premises surveyed were a mix of pubs, clubs, restaurants and takeaways as shown in figure 4.1.

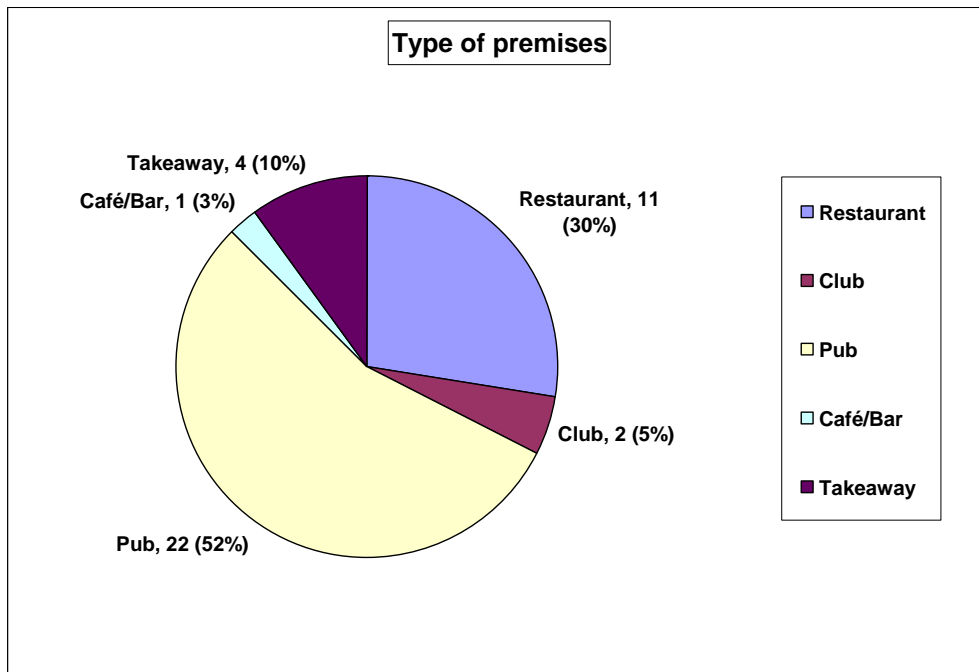


Figure 4.1

- A letter was written to each business to explain the reasons for the project, the advantages to the business if participating, and the hoped for outcomes. Within one week the premises were contacted by phone to arrange a suitable date for the detailed site survey.
- The introductory letter helped in some cases but it was often not read by the relevant person. This was especially the case in some of the larger chain pubs and restaurants where there would be several duty managers with varying shifts.
- If willing to do so, the businesses answered some preliminary questions so we could get an idea of number of existing appliances, flush volumes, whether urinals were controlled, customer numbers, and cost of their water per year. 18 premises answered preliminary questions by phone. Given that the quality of the technical answers was inconsistent and often did not match to the situation on site, the usefulness of this was low.
- It was not easy to arrange visits. Some premises were very clear they did not want a visit during opening hours, which was difficult as all the pubs had opening hours of 11 -11 on weekdays. Others only wanted to be surveyed outside of their core busy periods. As we did not know how long surveys would take until we were actually at the premises, it was difficult to agree to actual times apart from the first visit of the day.
- Some sites were very reluctant to be visited saying it was not suitable despite a list of dates and times. The difficulty in visiting seemed to be down to individuals rather than whether a chain, owner occupied, type of premises etc. Overall, takeaways were the most difficult type of premises to arrange a site survey for.

- We tried a variety of different tactics to arrange site visits. We cannot identify any particular strategy other than persistence, calling at all hours and as a last resort dropping into the premises “on spec”. Employing the latter tactic, we found the staff at the premises unfailingly polite and helpful, even when management had said a survey would not be possible.

#### 4.1 Water audits

- ech<sub>2</sub>o undertook a detailed audit of 37 premises, a partial survey of one premises and phone surveys of two premises who would not agree to a site visit.<sup>6</sup> Information was noted and collected about:
  - ~ water costs
  - ~ water awareness
  - ~ customer numbers
  - ~ WCs (number, type, flush volume)
  - ~ urinals (number, type, whether controlled or not)
  - ~ taps (type, and performance of percussion taps in particular)
  - ~ flow rates from taps (rated as good, average, excessive)
  - ~ leaks on the premises
  - ~ potential for data logging
- We endeavoured to strike up a relationship with owners of the premises surveyed, both over the telephone when we were arranging the site visits and during the actual survey itself. This was quite time consuming but we felt it was an important factor in ensuring the project was as successful as it could be.
- The surveys carried out by ech<sub>2</sub>o were rigorous and on average took 3.5 hours per visit. Actual numbers of urinals, WCs and taps (both in WC areas and bar areas) the amount of water required to flush the WCs, and flow rates from all taps were recorded.
- Where possible we fitted Save-a-flush bags to WCs.
- We identified WCs where Save-a-flush bags could be fitted, but needed head office agreement to do so.
- We identified sites where urinal controls could be fitted.
- We identified sites where data loggers could be fitted.
- We reduced excessive flow rates if authorisation was given to do this.
- We notified owners of leaks and fixed one leak while on site.
- We wrote an individualised and detailed report for each premises within two weeks of the site survey. The report detailed the water savings they were already making if they had water efficiency measures fitted (whether by ech<sub>2</sub>o, whilst on site, from Save-a-flush bags and flow rate adjustment or previously, from urinal controls).
- We highlighted the potential savings if other water efficiency measures were implemented.
- All reports were calculated using actual data from each individual premises.

- See Appendix 1 (page 50) for an example of the report.

#### **4.2 Water costs per year**

- It was hoped that we could gather information about average water costs per premises per year. This proved virtually impossible. In most cases bills were sent directly to head office. Even when the proprietor paid the bills directly, this was often handled by their accountant and so copies were not available on site.
- It is a very busy industry, with long hours and understandably there was little time to search for this information if it was not immediately to hand.
- Contacting head office to obtain bills was not successful, although considerable time was spent doing this.
- Three sites were able to supply bills for us to read. One takeaway had remarkably high bills until it transpired that the owner was paying off unpaid bills from three years previously. Two pubs could show us the last bills they received, but not bills across a whole year.
- Most owners or managers had little idea of their water costs per year.

#### **4.3 Water awareness**

- Most premises were not water aware prior to our visit although everyone was aware of the hosepipe ban that had occurred during the 2006 summer. Most of the owners and staff we talked to appreciated that saving water would reduce their bills and be good for the environment. However there was little knowledge of how easy or hard that would be to do, or which measures would save most water.
- Raising staff awareness on a permanent basis is difficult as turnover of staff is high.
- Water awareness did increase throughout the time of our audits, which spread out over four weeks in three separate blocks. By the time of our last visit, owners and staff had seen the signs for Save-a-flush bags while drinking at other pubs or had heard that we were in the area doing water audits. This informal network for information gathering and dissemination proved very useful to the successful outcomes of the project.

#### **4.4 Customer numbers**

- Information about customer numbers was very sketchy. Customer numbers change throughout the day and are usually more at the weekends. Pubs with gardens were busier during the summer months, making weekly estimations all the more difficult.
- Some of the chain restaurants had customer numbers analysed by head office as part of performance rating. The nightclubs had figures as they had to limit numbers due to fire regulations.

- Where precise customer numbers were known the savings were calculated using this information. However in most cases we had to use the owner's/staff's rough estimates.

#### 4.5 WCs

- There are a total of 265 WCs across the premises surveyed.
- WC numbers were dependent on size of premises as would be expected. Overall, pubs/clubs had the largest number of WCs on the premises. Details of numbers of WCs and differing flush volumes are shown in figures 4.2, 4.3, 4.4 and 4.5.
- Takeaways did not have WCs for the public. One takeaway had no WC facilities for staff on the premises, but the staff did have access to a WC in the flat adjacent to the premises.
- Most WCs in the premises surveyed had a flush volume of 7.5 litres or 9 litres. Four premises had 6 litre single flush and three premises had 6 and 4 litre dual flush.
- Flushing volumes were generally lower in disabled WCs as many had been recently refurbished, (presumably to conform to the revised Part M of the Building Regulations).

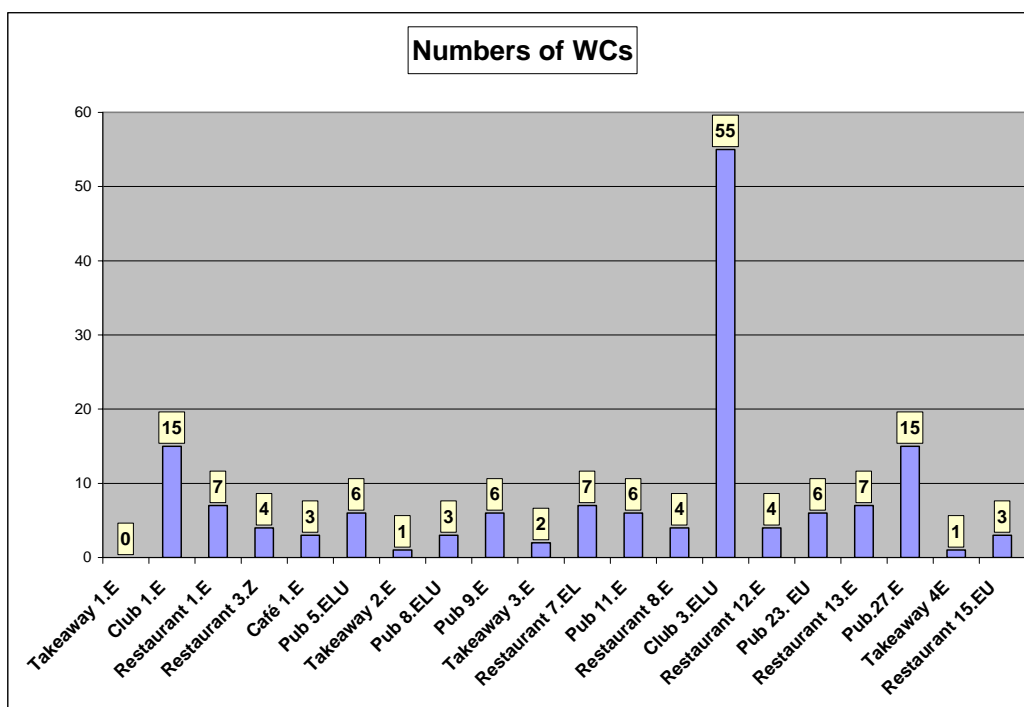


Figure 4.2 (See Figure 4.3 for breakdown of flushing volumes)

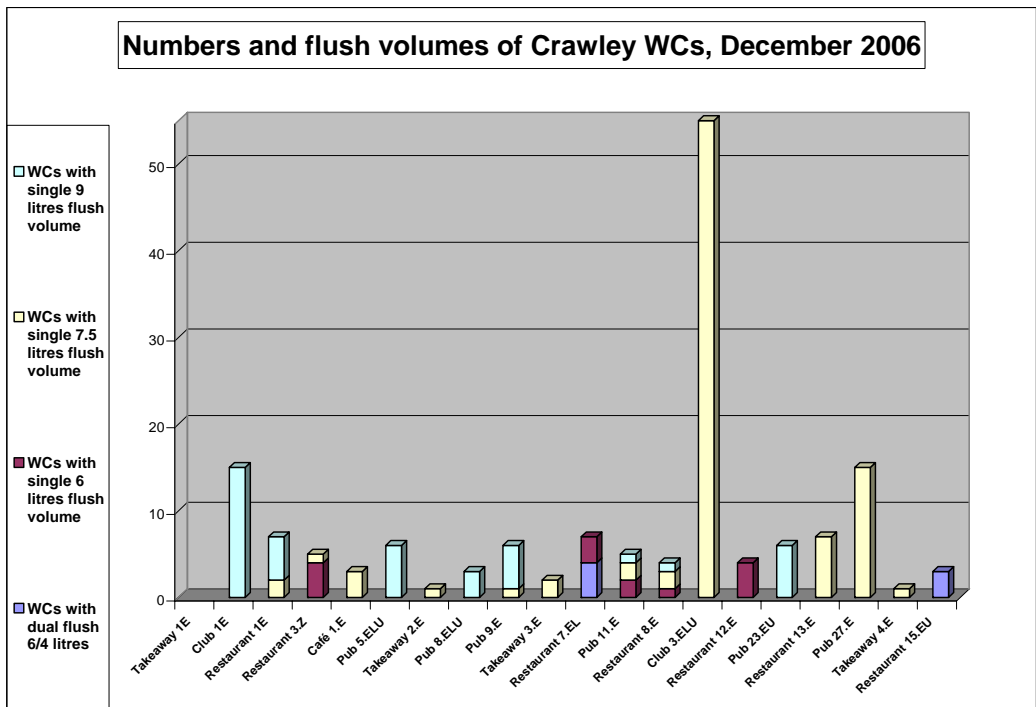


Figure 4.3

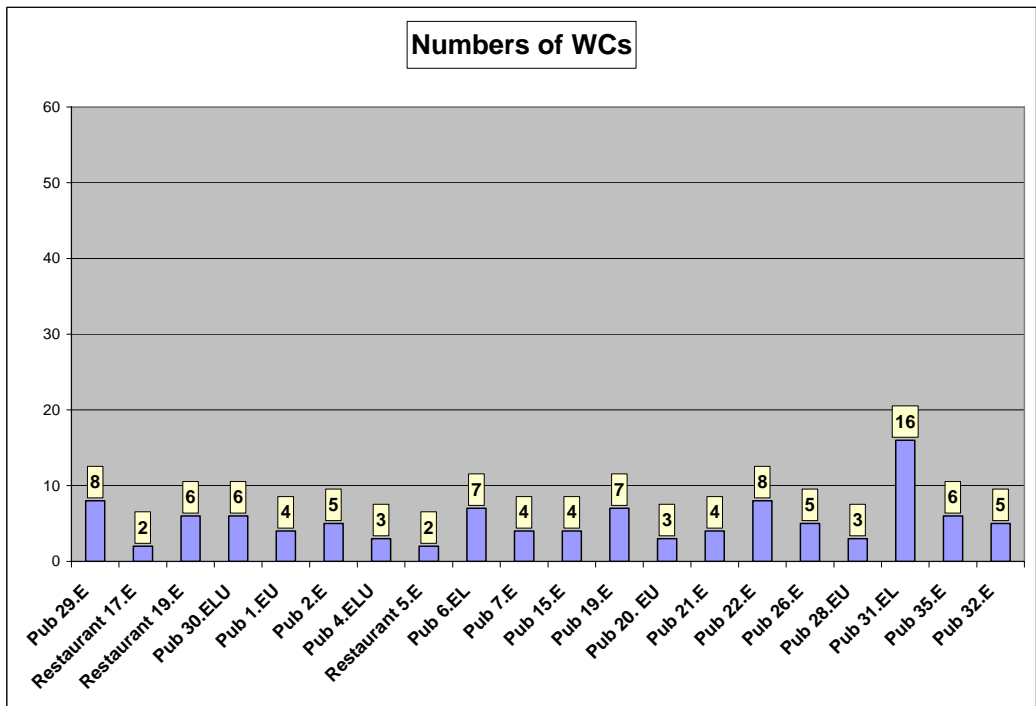


Figure 4.4 (See Figure 4.5 for breakdown of flushing volumes)

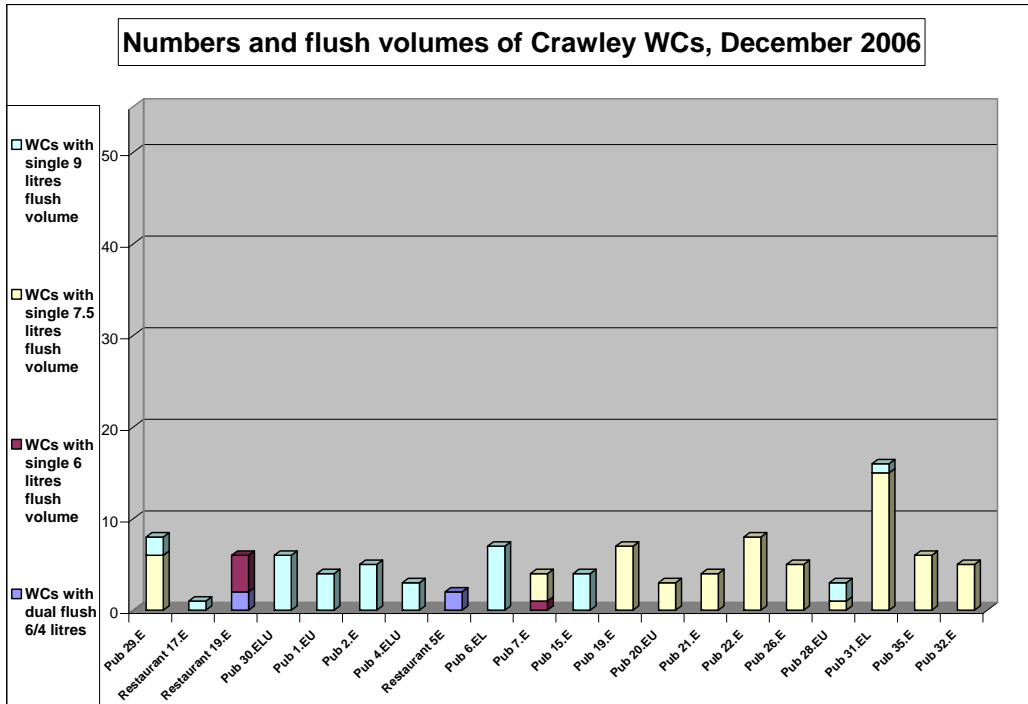


Figure 4.5

- Figure 4.6 shows an overview of the flush volumes in the 40 sites visited divided in to the men's, woman's, staff and disabled WC's. Six litres is currently the maximum flushing volume available in a single flush WC. The information gathered, clearly shows the number of sites with new efficient WC's with flush volumes of under 6 litres as very low.

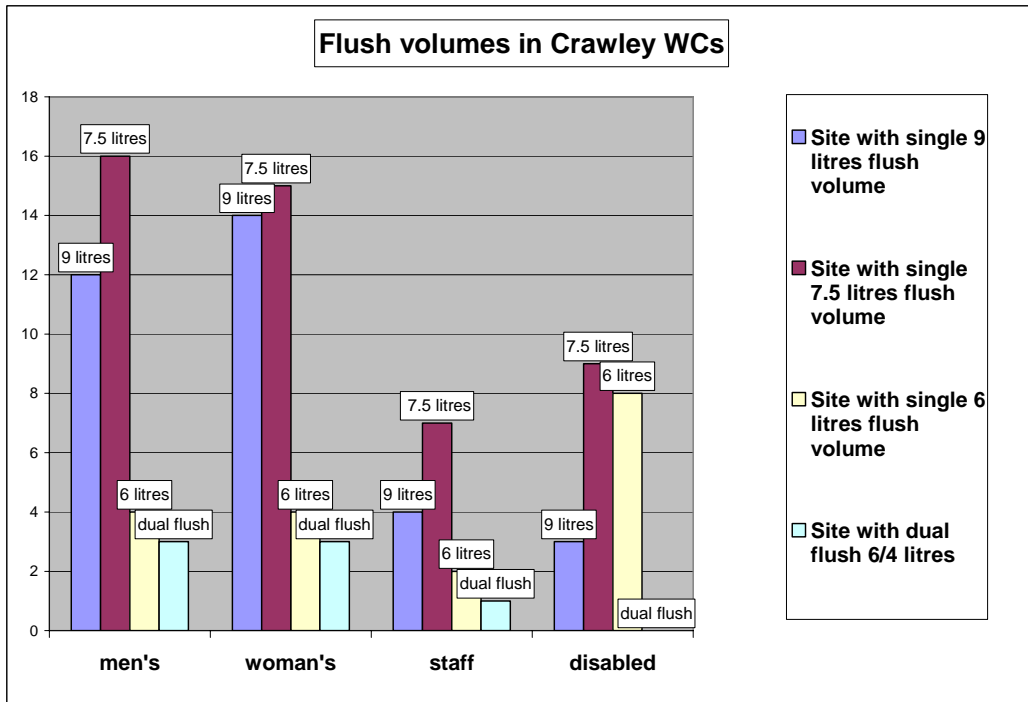


Figure 4.6

## 4.6 Urinals

- 18 premises already had urinal controls fitted.
- 13 premises did not have urinal controls fitted and were identified as suitable candidates for free controls under the project.
- One premises did not have controls fitted but supply pipework was inaccessible and controls could not be fitted without major refurbishment works.
- One premises had waterless urinals.
- Seven premises did not have urinals.
- Figure 4.7 shows the above. Figures 4.8 and 4.9 show the urinal situation by premises.

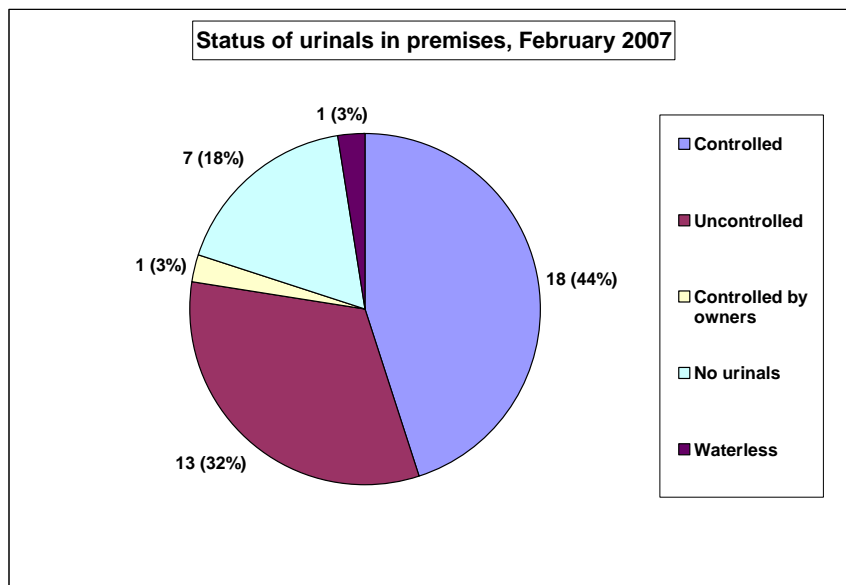


Figure 4.7

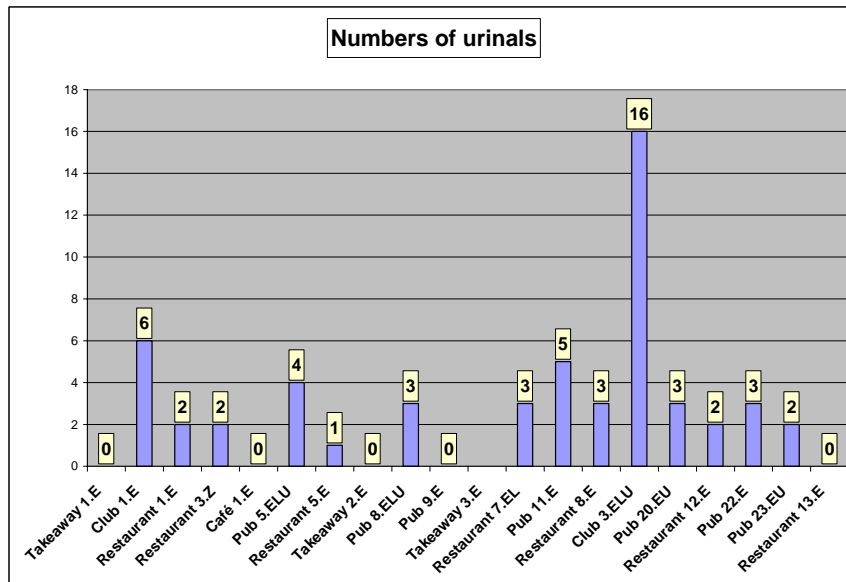


Figure 4.8<sup>7</sup> (See also Figure 4.9)

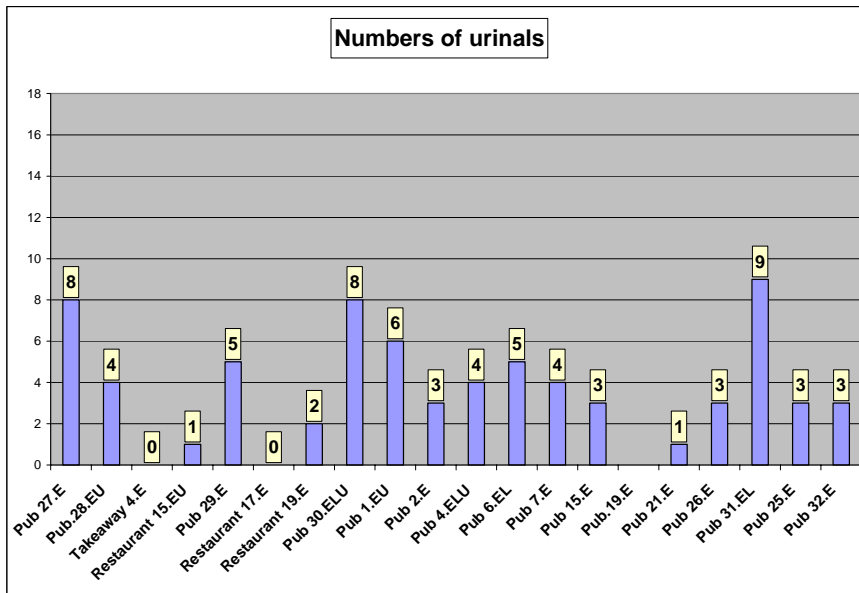


Figure 4.9<sup>8</sup> (Continuation of Figure 4.8)

- There are a total of 127 urinals across the 40 premises surveyed.
- The total number of controlled urinals was 66.
- The total number of uncontrolled urinals was 57.

#### 4.7 Taps

- Most percussion taps were poorly maintained and working incorrectly. Most came on for too long but a minority would either not come on at all, or came on for less than one second.
- It was not possible to adjust the length of time the taps were on as all percussion taps were non-adjustable types, even the newer ones.
- No taps were fitted with flow regulators.
- Thirteen sites were identified as good candidates for flow regulators to be fitted as flow rates are high, no isolating valves are fitted and there is easy access to pipework under the basins.

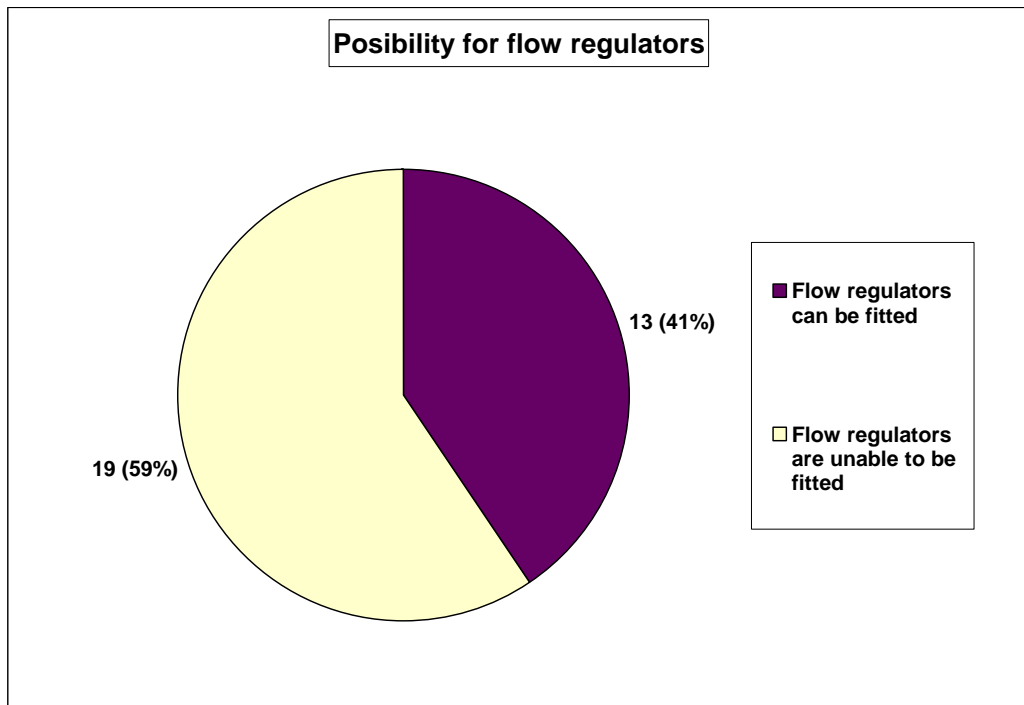


Figure 4.9

- We adjusted excessive flow rates in taps in 30 premises. We adjusted flow rates down by 2-6 litres per minute depending on type of tap and original flow rate.
- We did not attempt to estimate individual savings per tap adjusted, but have estimated a conservative 100 litres per day per premises from this measure.
- **Total savings from adjusting flow rates are 3,000 litres per day, 21,000 litres per week, 1,092m<sup>3</sup> per year.**

#### 4.8 Leaks

- Two sites had obvious leaks, which was fewer than expected given the state and age of WCs, urinals and washbasins in the premises surveyed.
- We identified one leaking tap during the site surveys. This particular tap had been running for two to three months and was wasting 1,440 litres per day (a flow rate of 1 litre/sec). **We rectified this leak while on site.**
- We identified and notified the owners of the premises about a major leak on a WC cistern which we calculated to be wasting 1,440 litres of water per day (a flow rate of 1 litre/sec).
- We identified an unexplained leak (probably underground) from analysis of data loggers from the data loggers we fitted. This leak was wasting 3,025 litres of water per day.
- We calculated total water savings from identifying these leaks to be 5,905 litres of water per day.
- We estimate that the leaks from the tap and WC cistern would have occurred for a (conservative) further one month if we had not identified them. Therefore 87 m<sup>3</sup> of water has been saved.

- We estimate that the underground leak would have remained unidentified for at least two months and therefore the saving is 182m<sup>3</sup>.
- **Total savings from rectification of leaks are 269m<sup>3</sup>.**

#### 4.9 Potential for data logging

- The project aimed to log ten sites.
- Sites were checked for possibility for logging. We wanted to ensure a range of sites to be data logged. The difficulty in getting head office approval ruled many sites out immediately.
- Incompatibility of existing meters ruled out one identified site.
- The sites chosen were seven pubs, two clubs and one restaurant. One pub was very water aware. One club already had urinal controls fitted but no Save-a-flush bags to reduce WC flushing volume. The second club we fitted Save-a-flush bags during the site survey, but it had no urinal controls. The restaurant had been refurbished in 2005. It had urinal controls, 6 litre flush WCs and percussion taps. Five of the pubs did not have urinal controls.
- Details of preliminary logging data is shown in Section 8.
- Sites will be logged for two years. Further funding is required to monitor these sites, carry out further water efficiency measures, and gather actual data on how much water is saved.

## 5 Water savings from WCs

- Save-a-flush bags are cistern displacement devices. They are essentially bags of silicone gel. Within 24 hours of being immersed in water, the silicone swells and the bag displaces 1 litre of water when the cistern refills thus resulting in a 1 litre saving per flush.



Figure 5.1 Save-a-flush bag in cistern

- Following the telephone survey of the premises audited by Crawley Council it was clear that leaving Save-a-flush bags with management during the audit would result in very few of the bags being fitted.
- A decision was therefore taken to fit Save-a-flush bags on site during the audit if access to the WC cisterns was possible and permission could be given while on site.



Figure 5.2 Shelf to prevent drug taking

- Not all cisterns were accessible.
- Some low-level cisterns in the city centre pubs had sloping surfaces securely fitted above the cisterns to prevent drug taking. In most cases these were too securely fixed to enable access to the cisterns without damaging the surrounding decor.
- If cisterns were concealed we fitted Save-a-flush bags if the panels could be removed without damaging surrounding surfaces.



Figure 5.3 Removing panels to fit Save-a-flush bags

- When stepladders were available on site, we fitted Save-a-flush bags to high-level cisterns.
- When we fitted a Save-a-flush bag we put a sign on the cistern indicating the fact.<sup>9</sup>



Figure 5.4 Sign showing Save-a-flush bag is fitted

- A total of 101 Save-a-flush bags were fitted during the water audits across 19 premises. This is 39% of all WCs, as detailed in Figure 5.5.<sup>10</sup>

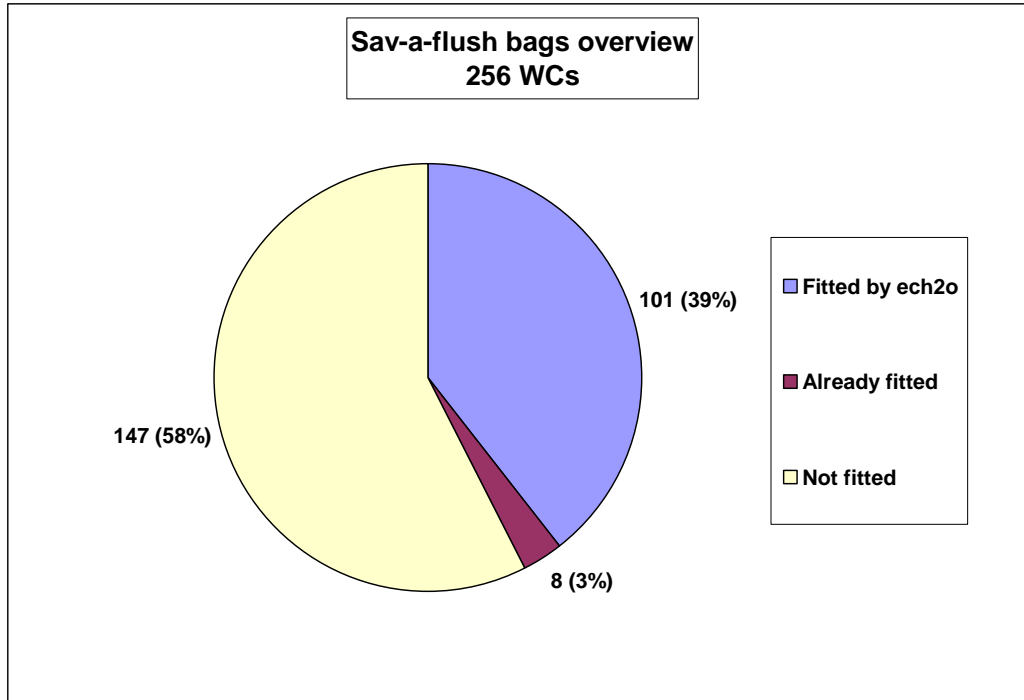


Figure 5.5.

- In many of the chain restaurants and pubs we were only able to fit Save-a-flush bags in the staff toilets as the duty managers or staff, were unable to give authorisation to fit them elsewhere without head office approval.
- Customer numbers were known at some premises but not at others.
- We calculated savings based on the information about customer numbers submitted by owners or managers. Where that was not possible we estimated savings. We are confident that our estimation of water saved is based on sensible figures.
- We calculated savings from all premises as 3,148 litres per day.
- Weekly savings from the Save-a-flush bags we fitted are 22m<sup>3</sup>.
- Yearly savings are 1,146m<sup>3</sup>.
- Businesses will save a total of £1,604 per year at 2007 prices.
- We further identified WCs where Save-a-flush bags could be fitted if head office gave approval. These savings were notified by letter to the premises concerned.
- **Total savings from Save-a-flush bags fitted during the project are 1,146m<sup>3</sup> per year.**
- **A further 635m<sup>3</sup> of water a year could be saved if the relevant head offices gave approval and Save-a-flush bags were fitted.**

## 6 Water savings from urinals

- 13 premises did not have urinal controls fitted and were identified as suitable candidates for free controls under the project.
- One premises did not have controls fitted but supply pipework was inaccessible and controls could not be fitted without major refurbishment works.
- We identified three premises from the original council survey without urinal controls and offered them free controls under the scheme.<sup>11</sup> Restaurant 11.ZU was identified as a candidate for controls following the telephone survey. Two other sites, Pub 33.ZU and Pub 3.ZU were identified by landlords who were having urinal controls fitted under the project in other premises they owned. (Both Pub 33.ZU and Pub 3.ZU had been incorrectly noted in the original council survey as not needing controls.) An extra total saving of 388m<sup>3</sup> of water per year will be made from these three sites.
- In April 2007, we offered all 16 suitable premises the chance to have free controls fitted under the scheme.
- The owner or duty manager of each suitable site was notified in writing that they were eligible. The letter requested a signature and the agreement to display a sign (provide by ech<sub>2</sub>o) by the urinals.
- It proved very difficult to get authorisation in writing. Letters were resent in 30% of cases, and follow up telephone calls were made urging signatures. Only five premises agreed in writing.
- A decision was made to accept verbal agreement over the phone to ensure as many premises as possible had controls fitted.
- There are four sites that were noted as candidates for controls to be fitted but decided against the benefits of the urinal controls being fitted.
  - ~ **Restaurant 3.Z:** Were visited as a result of being identified as not having controls from the follow up telephone survey, originally conducted by the council. The manager wanted free controls but needed authorisation from the owner, who was out of the UK for the duration of the project.
  - ~ **Takeaway 3.E:** They switch off the water manually, when the building is empty. They did not want a site visit and it was very difficult to communicate with the owner, as he was constantly unavailable.
  - ~ **Restaurant 5.E:** The staff at the restaurant switch the water on and off manually. After considering the option of having controls fitted, they decided against having them fitted. We felt that they could still save them water when the premises were occupied but the urinals were not in use; however, they decided to stay with their current system.
  - ~ **Pub 32.E:** Pub 32.E is part of a major pub chain. The pub has two separate men's toilet areas with three urinals in each. They are currently having controls tested by head office in one area. Head office were approached by the manager to see whether they would be interested in having free controls. They want controls and a maintenance contract from the same company, in all of their pubs and so declined the offer. As they are currently testing controls in one of the urinals, head office are aware of the water savings they could make from having them installed.

## 6.1 Installed urinal controls

- A total of 12 premises had 20 free urinal controls fitted under the BREW project, nine pubs, one club and two restaurants.<sup>1</sup> Figure 6.1 and 6.2 detail the premises where controls were fitted.

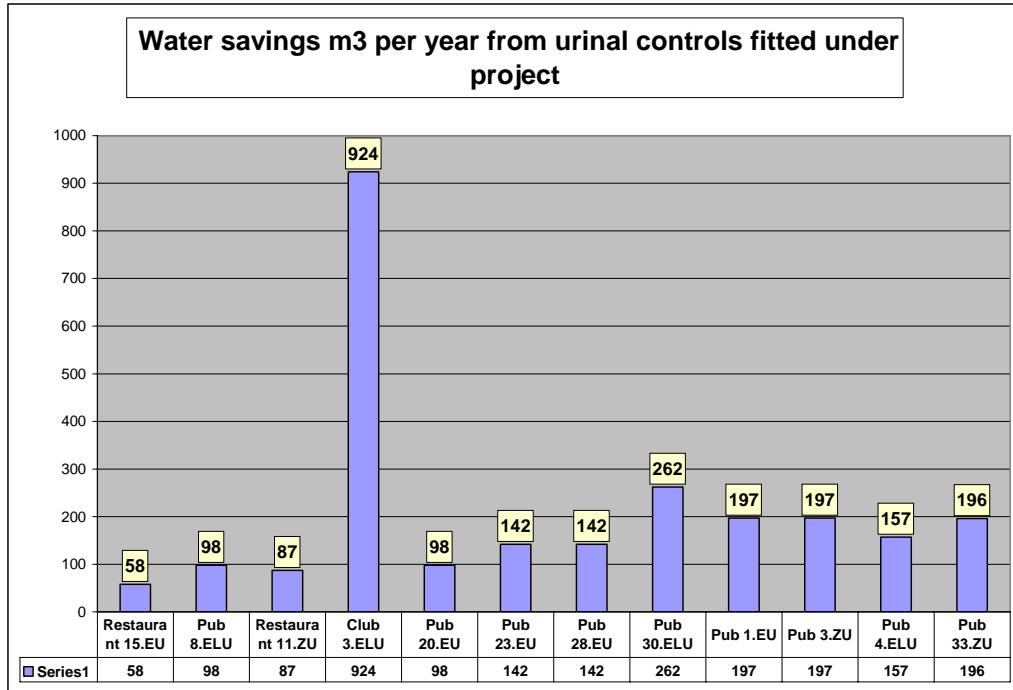


Figure 6.1

site name	m <sup>3</sup> saved pa from controls being fitted	number of urinal spaces		numbers of controls
Restaurant 15.EU	58	1	restaurant	1
Pub 8.ELU	98	3	pub	1
Restaurant 11.ZU	87	2	restaurant	1
Club 3.ELU	924	16	club	4
Pub 20.EU	98	3	pub	1
Pub 23.EU	142	4	pub	2
Pub 28.EU	142	4	pub	1
Pub 30.ELU	262	8	pub	2
Pub 1.EU	197	6	pub	2
Pub 3.ZU	197	6	pub	2
Pub 4.ELU	157	4	pub	1
Pub 33.ZU	196	6	pub	2
<b>Totals</b>	<b>2,558</b>	<b>63</b>		<b>20</b>

Average savings per site: 213m<sup>3</sup>

Average saving per urinal: 41m<sup>3</sup>

Average £ saved per urinal per annum at 2007 prices: £57.40

Total £ saved per annum at 2007 prices: £ 3,581

Figure 6.2

<sup>1</sup> We identified faulty existing controls in a pub (Pub 5.ELU) being data logged. Free urinal controls will be fitted in June 2007 under the project. Savings will be 142m<sup>3</sup> of water a year. This data is not included in any graphs or overall figures for the project.

- There are a total of 63 urinals/urinal spaces across the 12 premises.
- Nine premises are pubs with two or more urinals fitted. A total of 44 urinal spaces are in the pubs. Using a flushing volume of 7.5 litres per hour for all multiple urinals (as per Water Regulation recommendations) this is a total of 330 litres of water to flush the urinals every hour. Pub shut down periods vary slightly and the water savings for each site have been calculated on their actual shut down periods. The urinal controls will save 1,489m<sup>3</sup> per year.
- Two premises are restaurants. One restaurant has one urinal fitted, using a flushing volume of 10 litres per hour for single urinals (as per Water Regulation recommendations). The other restaurant has two urinals fitted and therefore a flushing rate of 7.5 litres per urinal per hour is used. Shut down periods are greater for the restaurants than the pubs. Savings have been calculated as 398 litres per day, 145m<sup>3</sup> per year.
- One premises is a club with 16 urinals. Using a flushing volume of 7.5 litres per hour for multiple urinals (as per Water Regulation recommendations) and assuming a shut down period of 148 hours per week (the club does not open daily), savings are calculated as 17.8 m<sup>3</sup> per week and 923.5m<sup>3</sup> per year.
- **Total savings from urinal controls are 2,558 m<sup>3</sup> per year**
- Businesses will save a total of £3,581 per year at 2007 prices.
- We are confident in realising at least these savings. Shut down periods were confirmed by the owners of all premises during the original surveys. Furthermore, some urinals were patently flushing more frequently than 7.5 litres per urinal per hour. The sophisticated controls that will be fitted ensure flushing volumes conform to Water Regulation recommendations.

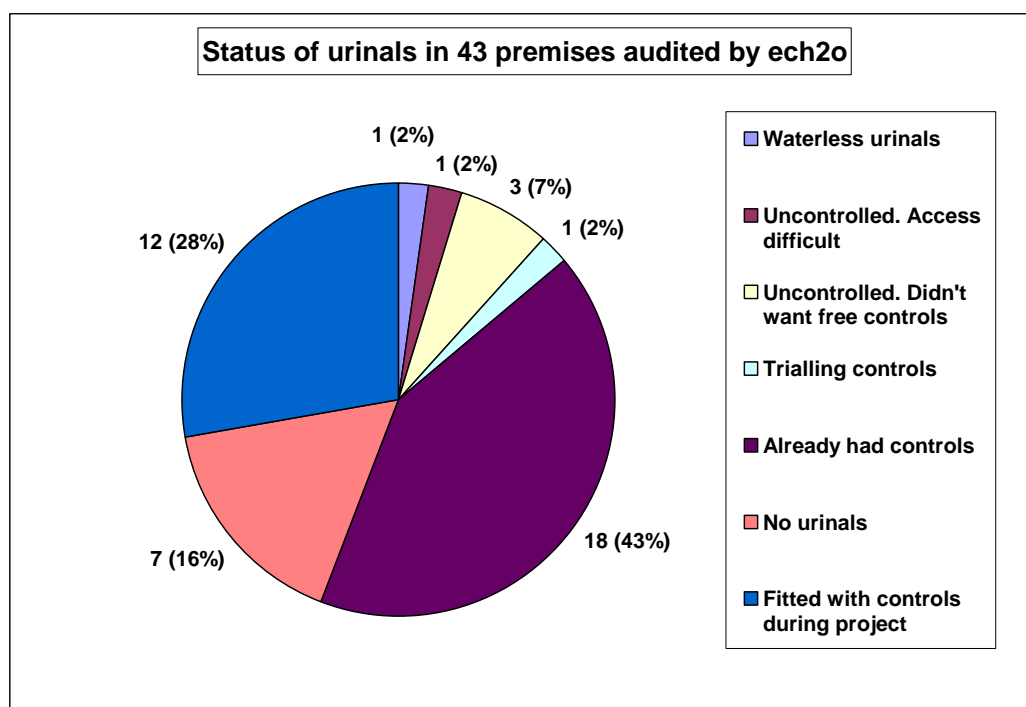


Figure 6.3

- By the end of the project just three premises out of the original 40 audited by ech<sub>2</sub>o still have totally uncontrolled urinals. Pub 27.E has eight uncontrolled urinals as pipework is not accessible without major refurbishment works. Restaurant 3.Z still has two completely uncontrolled urinals. Pub 32.E has three uncontrolled urinals and three controlled urinals. There are a further two premises without automatic urinal controls. The urinals in Restaurant 5.E and in Takeaway 3.E are manually turned off at night by the owners. Figure 6.3 shows this, and has included the three other premises where urinal controls have been fitted.

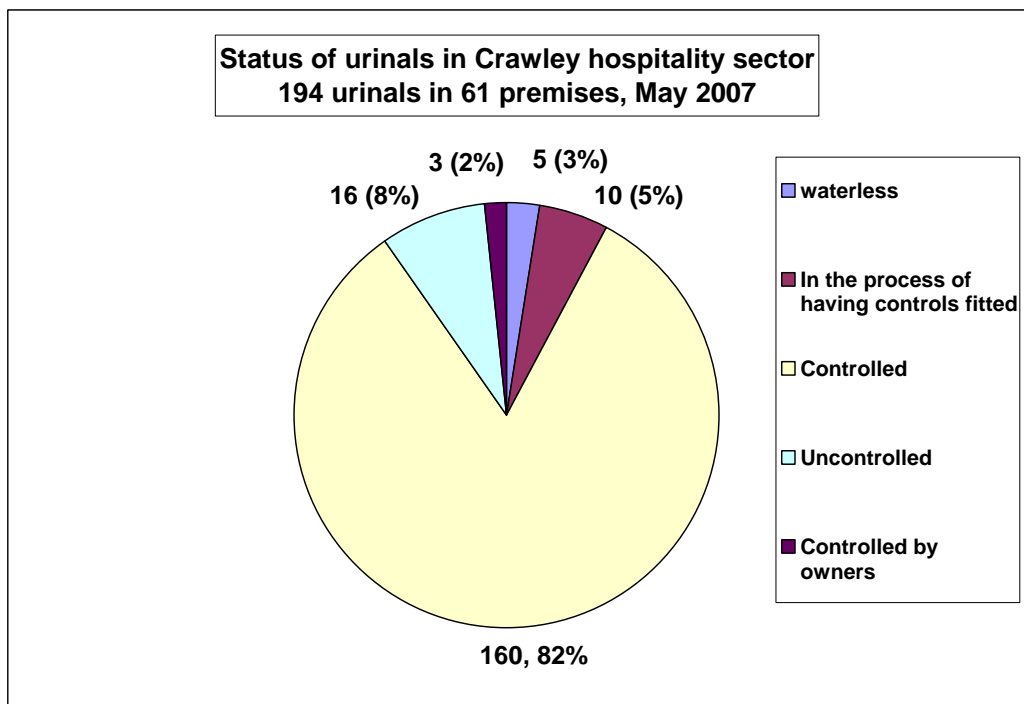


Figure 6.4

- Figure 6.4 shows the situation with regard to controlled and uncontrolled urinals in all 61 hospitality businesses in the Crawley area that the project was able to contact. By the end of the project, out of a total 194 urinals, there are now 160 controlled urinals in Crawley, 16 totally uncontrolled urinals and a further ten urinals where controls will “be fitted soon”.

## 7. Total water savings

- Total annual water savings were calculated in February 2007 after all the audits were completed and again in May 2007 after urinal controls were fitted.

### 7.1 Actual and potential water savings, February 2007

- The actual and potential annual water savings were calculated for every premises in February 2007. The savings were from WCs and urinals only at this stage. We did not calculate savings from reducing flow rates or rectifying leaks. Details are shown in Figures 7.1 and 7.2

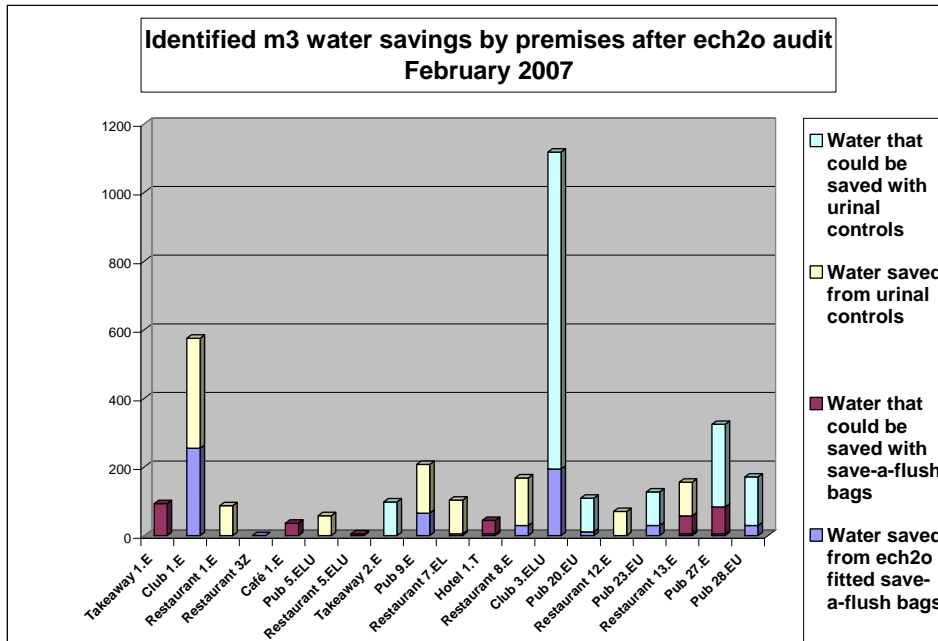


Figure 7.1 (See also Figure 7.2)

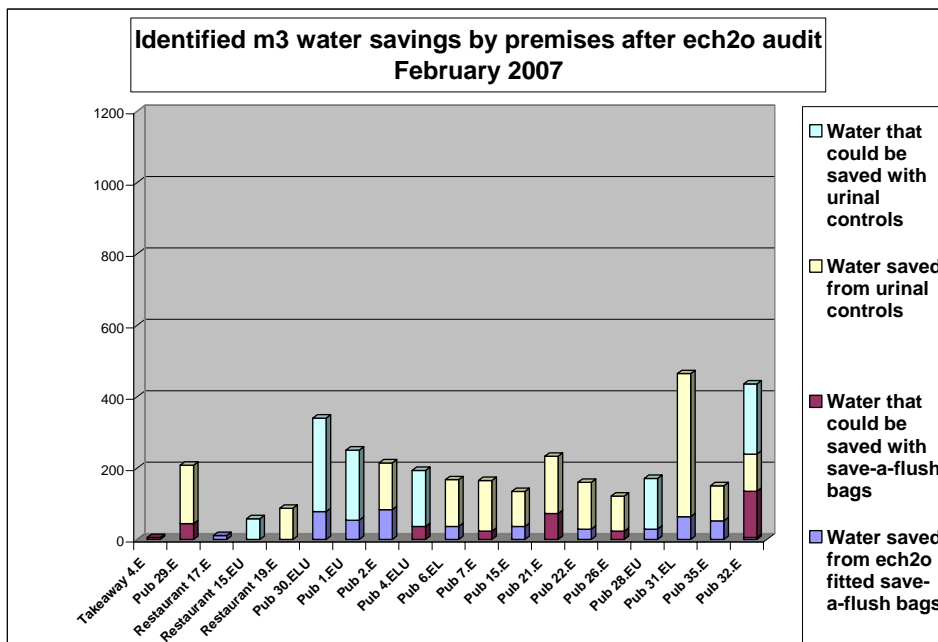


Figure 7.2 (Continuation of Figure 7.1)

- Total savings across all 40 premises surveyed, both existing and potential were aggregated.
- Total savings from the Save-a-flush bags fitted was 1,146m<sup>3</sup>.
- Total potential savings if Save-a-flush bags fitted were fitted to all WCs with a flush volume greater than 6 litres was 635m<sup>3</sup>.
- Total savings from existing urinal controls was 2,800m<sup>3</sup>.
- Total potential savings by installing urinal controls was 2,792m<sup>3</sup>.

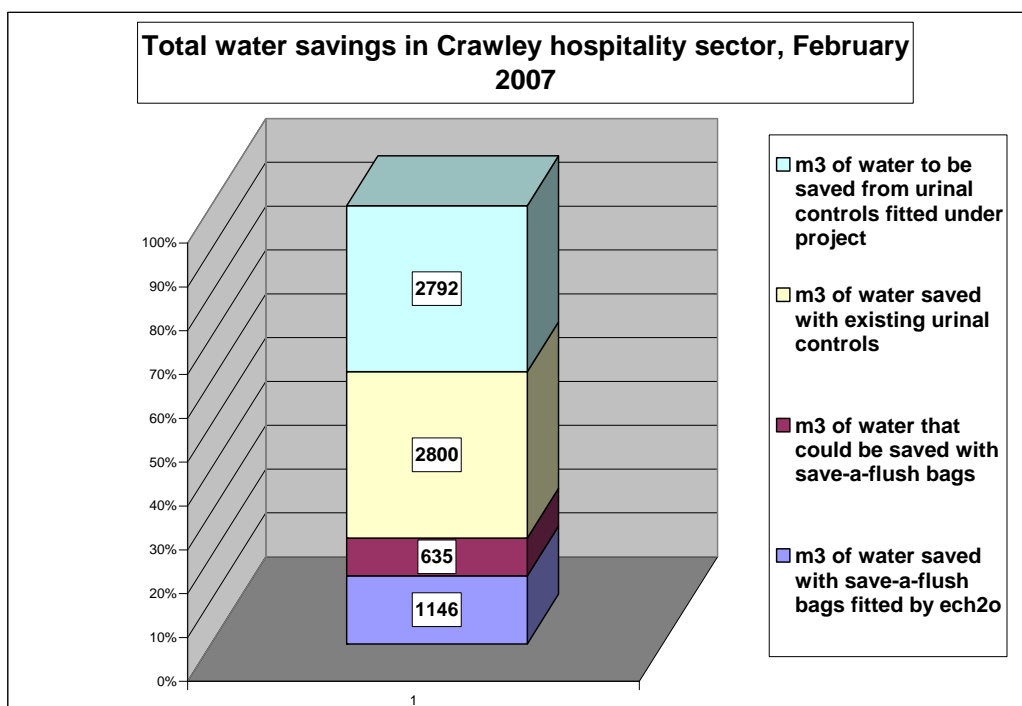


Figure 7.3

## 7.2 Actual water savings, May 2007

- In May 2007, once the urinal controls were fitted, the actual savings made by the project were recalculated. These differed slightly from the potential savings. Not all identified premises had had urinal controls fitted and some premises from the original council survey had had urinal controls fitted.
- **Total savings from fitting Save-a-flush bags are 1,146m<sup>3</sup> per year.**
- **Total savings from urinal controls are 2,558m<sup>3</sup> per year.**
- **Total savings from adjusting flow rates 1,092m<sup>3</sup> per year.**
- **Total savings from rectifying leaks are 269m<sup>3</sup>.**

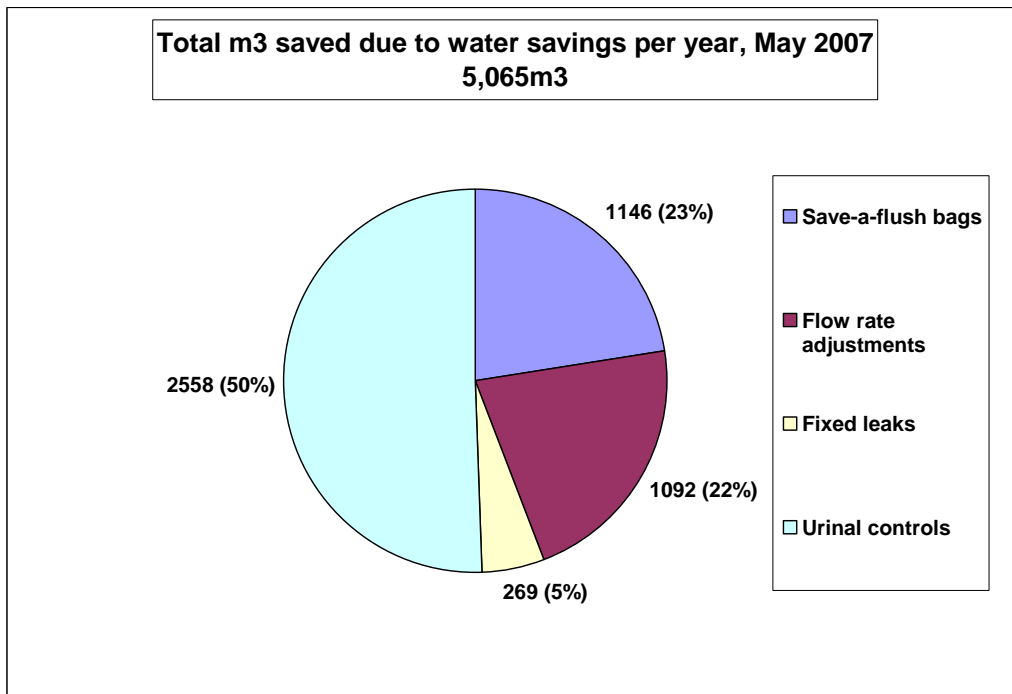


Figure 7.4

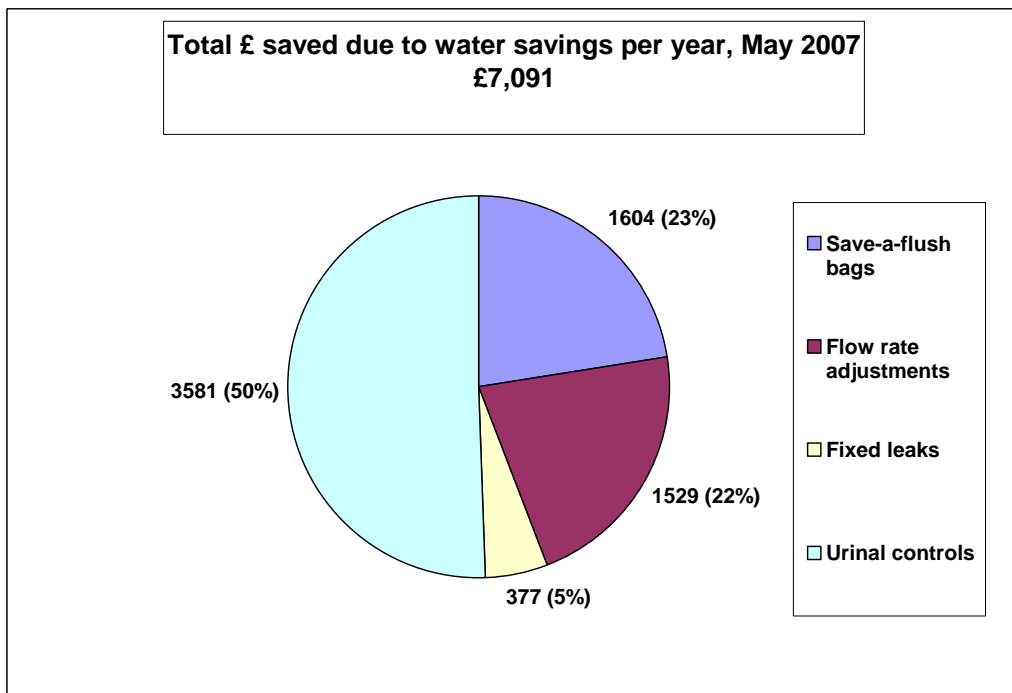


Figure 7.5 Monetary savings calculated at £1.40 per m<sup>3</sup> of water - 2006 price of 1.24 per m<sup>3</sup> with a 13% increase to reflect the average increase of water costs in the UK

- **Total water savings from ech<sub>2</sub>o's work under the BREW project across 43<sup>12</sup> premises are 5,065m<sup>3</sup> per year.**
- **Average saving is 118m<sup>3</sup> of water per premises per year.**
- **Average saving is £165 per premises per year.**
- **5,065m<sup>3</sup> of water saved is 6,078 kWh of energy saved, resulting in 2,735 kg of CO<sub>2</sub> not emitted**

### 7.3 Breakdown by type of premises

- Savings by sector are more complicated to work out. The figures below are savings from Save-a-flush bags and urinal controls.
- Total savings from pubs are 1,918m<sup>3</sup> across 24 pubs. **Average savings per pub are 80m<sup>3</sup> of water per year.**
- Total savings from clubs are 1,373m<sup>3</sup> of water. **Average savings per club are 686m<sup>3</sup> of water per year.** There were two clubs only. Savings are high as we fitted Save-a-flush bags in all WC cisterns and because one club had no urinal controls fitted. Shut down periods of clubs are greater than pubs leading to even greater savings from urinal controls.
- Total savings from restaurants are 296m<sup>3</sup> of water across 13 restaurants. **Average savings per restaurant are 22.8m<sup>3</sup> of water per year.**
- **Average savings per takeaway are less than 2m<sup>3</sup> of water per year.** We adjusted flow rates in a few taps. Takeaways had two staff WCs as a maximum, no urinals or public WCs and were very unwilling to allow us to visit.
- Given the low savings from takeaways, we would not suggest targeting these types of premises in future projects of this type. They are also the sector where we experienced most difficulty in gaining access to carry out audits.
- All other sectors show that large savings can be made.
- Savings would be greater in any project with a longer time-frame where the approval of head office could be obtained.

## 8. Data loggers

- The original idea was to fit data loggers and then fit water saving devices. However, the timescale of the project meant this was not possible.
- Data loggers were fitted in ten nominated sites during February 2007. All sites had initial problems of set up (mainly because the chosen contractors had little experience in providing these types of controls).
- Most sites started reliable monitoring by mid-March 2007 although inconsistent readings occurred beyond that time. This has caused some difficulty with the quality of average readings for some sites
- The cost of the data loggers includes online access to the data for two years from the date of installation. It is sensible that further funding is made available to continue to monitor these sites and to analyse various water efficiency measures that are fitted to the premises.
- Premises have access to their own individual site logging data. ech<sub>2</sub>o and Crawley council has access to data from all ten sites
- Headline data from each of the sites up to and including 10/May/2007 follows: (Base flow rates are for 15 minute periods)

### 8.1 Club 3.ELU

- Started reliable monitoring 23/March/2007
- Base Flow Minimum: Zero. The zero reading is quite rare, to the point where some days it is not registered at all and others it is only registered perhaps two to three times during a day. The figure for the maximum base flow, (5.5 litres per 15 minute period), occurs more often and may represent better the 'true' base flow.
- Base Flow Maximum: 5.5 litres.

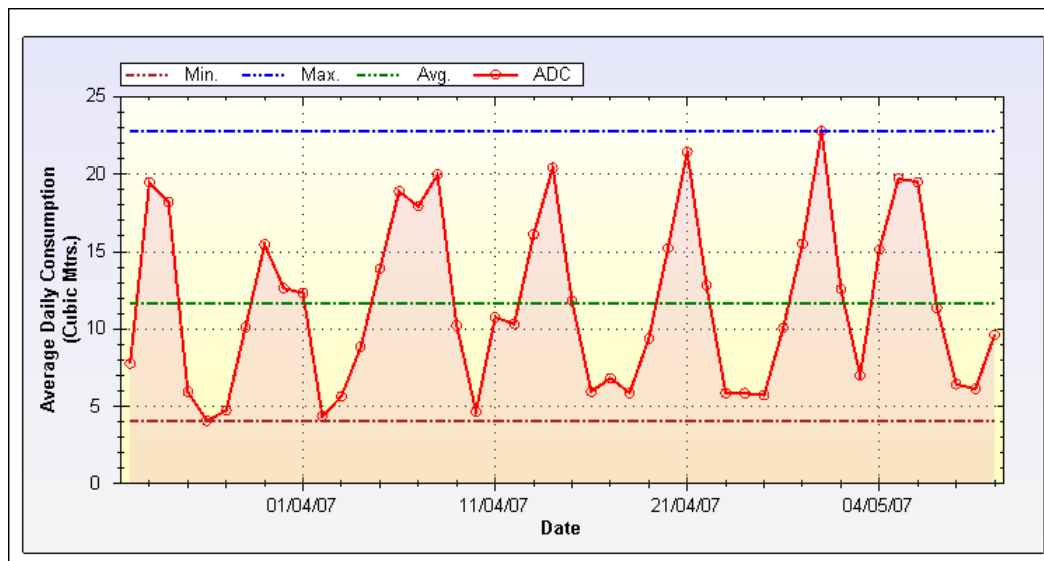


Figure 8.1 Club 3.ELU

- Minimum Daily Consumption: 4.080 m<sup>3</sup>.
- Average Daily Consumption: 11.559 m<sup>3</sup>.
- Maximum Daily Consumption: 22.790 m<sup>3</sup>.

- Fairly constant pattern though seems to be a trend of a slight rise in the consumption on Saturdays.
- Daily consumption (Figure 8.1) shows the sharp increase in water use at weekends when the club is open.
- The fact that even on days when the club is closed to the public, a large minimum figure of over 4,000 litres of water is consumed shows that there is a good potential for reductions.
- After fitting urinal controls to cisterns serving 16 urinals we would hope to see approximately a halving of the minimum daily consumption of 4.080 m<sup>3</sup>.
- The consumption report at Figure 8.2 shows that over a two day weekend period, the absolute minimum water flow consumption is 0.006 litres per second, 0.36 litres per minute and 21.6 litres per hour. This is likely to be the uncontrolled urinal cisterns filling up.

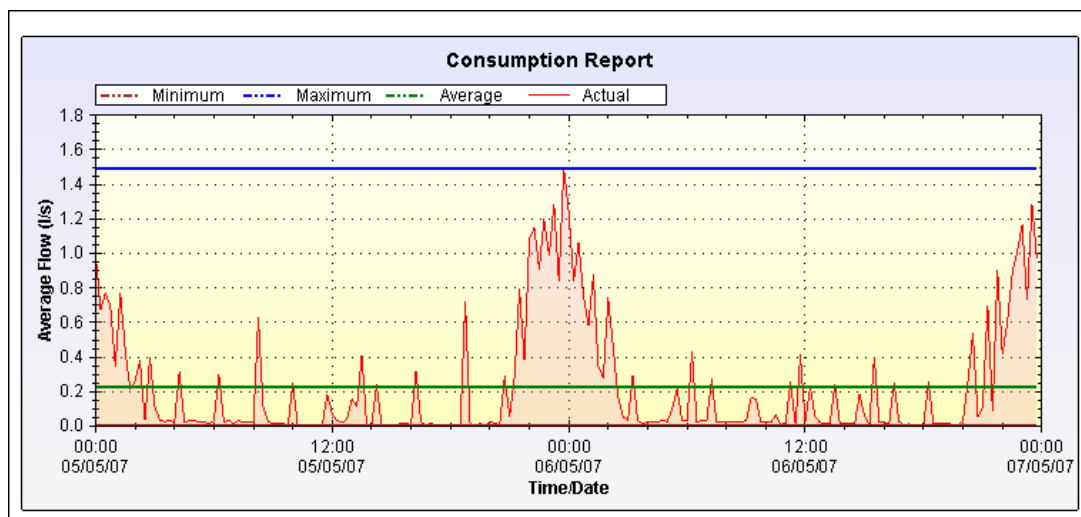


Figure 8.2 Club 3.ELU

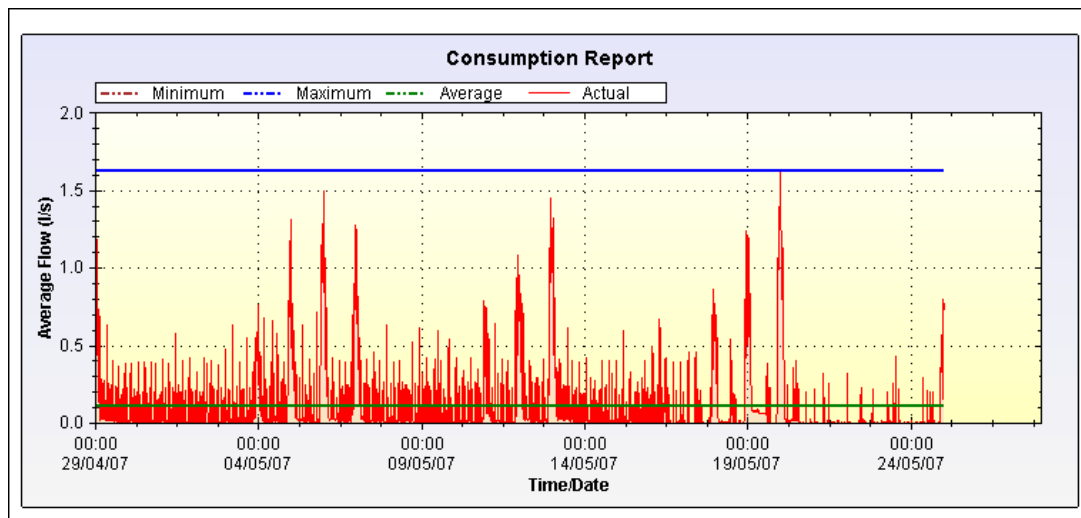


Figure 8.3 Club 3.ELU. The last month's water consumption; very visible improvements since urinal controls were fitted 28/May/2007

- Urinal controls fitted 21/May/2007. Data not analysed since controls fitted

- Urinal controls have clearly made a huge impact, reducing daily water consumption dramatically.
- Before fitting, a typical lowest average consumption day used 6.238m<sup>3</sup> of water (e.g. Monday 30/April/2007)
- After fitting a typical lowest consumption day is 1.194m<sup>3</sup> (e.g. Monday 21/May/2007) with very long periods of zero consumption now.
- Estimated savings from urinal controls were 924m<sup>3</sup>/year. Actual savings as detailed by data from the loggers look to be almost double that figure.

## 8.2 Pub 31.EL

- Started reliable monitoring 19/March/2007.
- Base Flow Minimum: 27 litres.
- Base Flow Maximum: 45 litres.
- Minimum Daily Consumption: 3.050 m<sup>3</sup>.
- Average Daily Consumption: 4.793 m<sup>3</sup>.
- Maximum Daily Consumption: 7.200 m<sup>3</sup>.
- Generally, consumption has fallen from the end of March to new levels in April; this downward trend appears to be continuing in May, although it is too early to say with certainty.

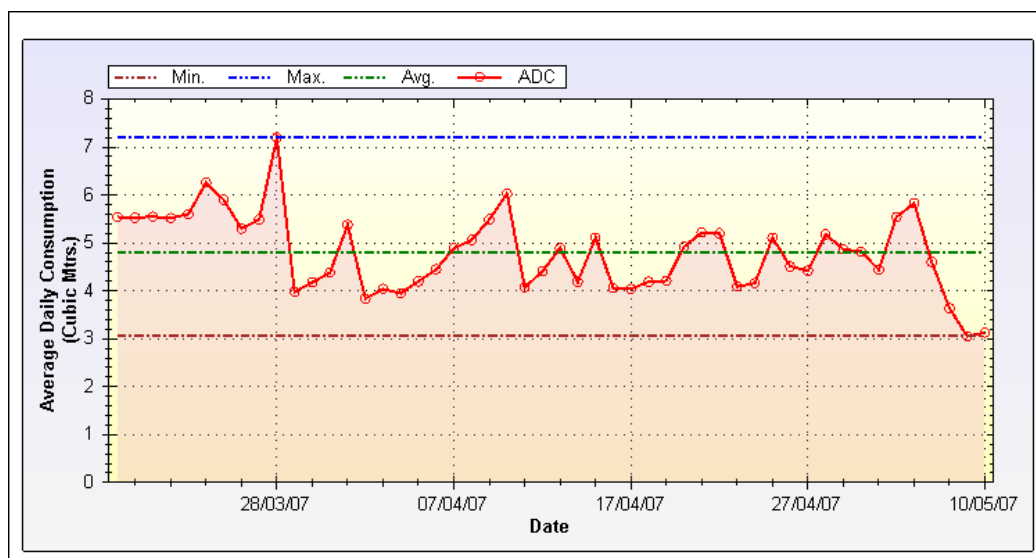


Figure 8.4 Pub 31.EL

- The minimum base flow has dropped from 33 litres per 15 minutes in March to 27 litres more recently.
- When we visited a new manager had just taken over who was very keen to improve the water performance of this premises.

### 8.3 Pub 6.EL

- Started reliable monitoring 19/March/2007
- Base Flow Minimum: Zero. This is definitely good evidence for the prudence of having urinal controls.
- Base Flow Maximum: 6 litres.

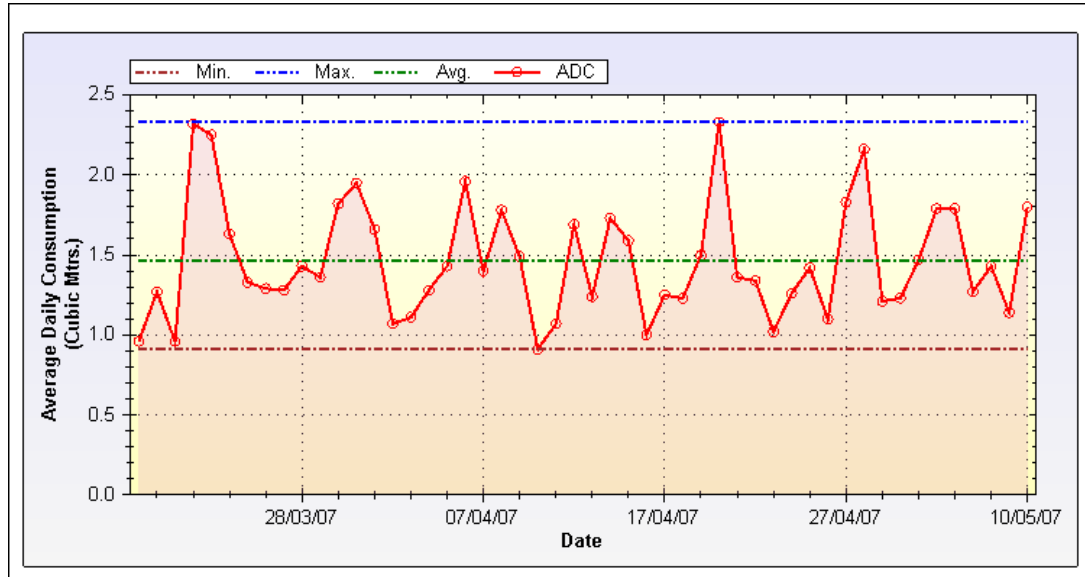


Figure 8.5 Pub 6.EL

- Minimum Daily Consumption: 0.910 m<sup>3</sup>.
- Average Daily Consumption: 1.464 m<sup>3</sup>.
- Maximum Daily Consumption: 2.330 m<sup>3</sup>.
- The fact that this pub uses at least 900 litres of water a day (minimum daily consumption is 0.910 m<sup>3</sup>) shows that there is still plenty of room for improvement. Measures suggested in the report such as flow restricted taps would certainly improve consumption levels.

### 8.4 Pub 5.ELU

- Started reliable monitoring 31/March/2007.
- Base Flow Minimum: 1 litre per 15 minutes.
- Base Flow Maximum: 2 litres per 15 minutes.
- Minimum Daily Consumption: 0.900 m<sup>3</sup>.
- Average Daily Consumption: 2.075 m<sup>3</sup>.
- Maximum Daily Consumption: 3.470 m<sup>3</sup>.

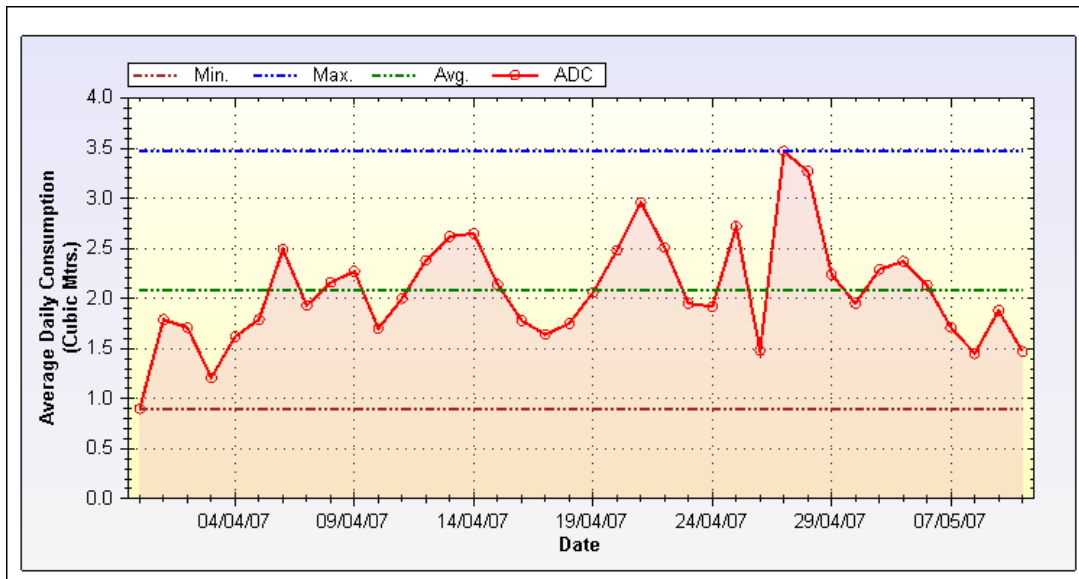


Figure 8.6 Pub 5.ELU

- For the most part a definite week/weekend pattern but quite erratic compared to other places.
- Looking at the data it appears that the urinal controls fitted in these premises may no longer be working.

### 8.5 Pub 30.ELU

- Started reliable monitoring 19/March/2007.
- Base Flow Minimum: 8 litres per 15 minutes.
- Base Flow Maximum: 14 litres per 15 minutes.
- Minimum Daily Consumption: 3.600 m<sup>3</sup>.
- Average Daily Consumption: 5.575 m<sup>3</sup>.
- Maximum Daily Consumption: 9.710 m<sup>3</sup>.
- Since this is a large venue, visited by up to 300 people a day, consumption is correspondingly large – at least 3,000 litres of water per day.

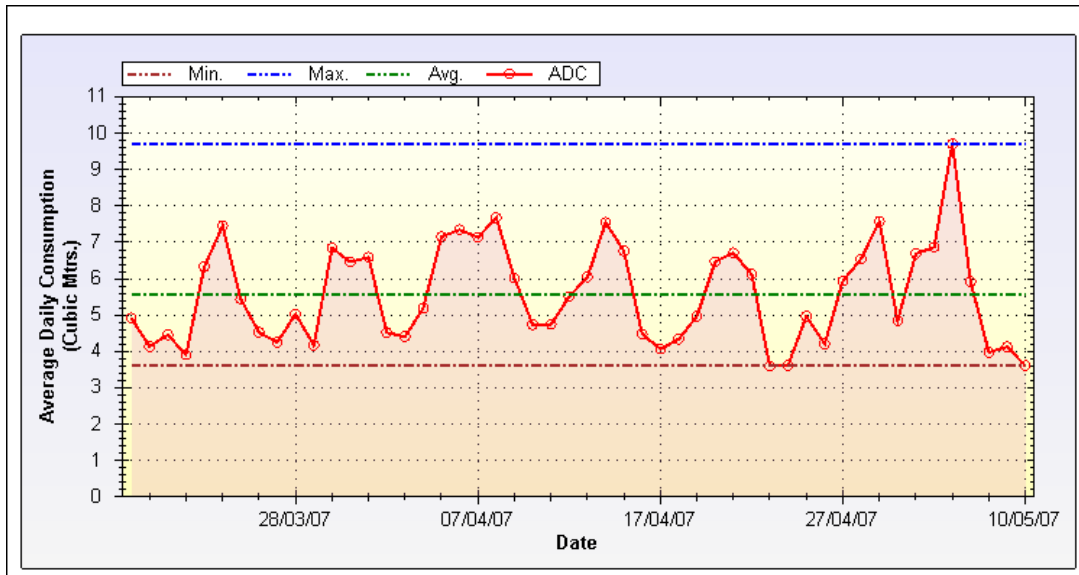


Figure 8.7 Pub 30.ELU

- Urinal controls would save around 720 litres from this amount as calculated during the audit.
- WC's, although now fitted with Save-a-flush bags, will still be flushing at around 8 litres and this too could be improved in an upgrade.
- This pub is very profligate with water, notwithstanding the large amount of users. The landlord is keen to save water but is sceptical of the savings that could be made. By showing the savings from fitting urinal controls, we should then be able to persuade him that simple measures such as reducing the flow rate from the taps will also have large effects. It should be possible to reduce the minimum daily water use of 3,600 litres by 50%.

## 8.6 Club 2.ZL

- Started reliable monitoring 03/March/2007
- Base Flow Minimum: Zero.
- Base Flow Maximum: 16 litres.
- Minimum Daily Consumption: 2.950 m<sup>3</sup>.
- Average Daily Consumption: 5.765 m<sup>3</sup>.
- Maximum Daily Consumption: 10.270 m<sup>3</sup>.

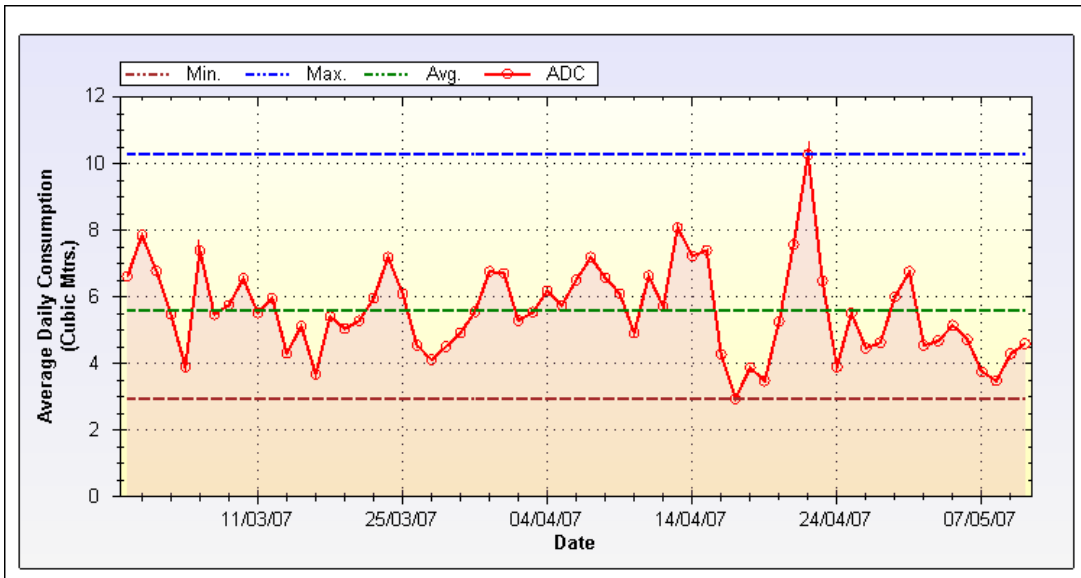


Figure 8.8 Club 2.ZL

- A large minimum daily consumption (nearly 3,000 litres) points to the fact that there is much room for improvement in this building even though a base flow of zero points to the fact that they have urinal controls already.

### 8.7 Restaurant 7.EL

- Started reliable monitoring 10/February/2007.
- Base Flow Minimum: Zero.
- Base Flow Maximum: 5 litres.

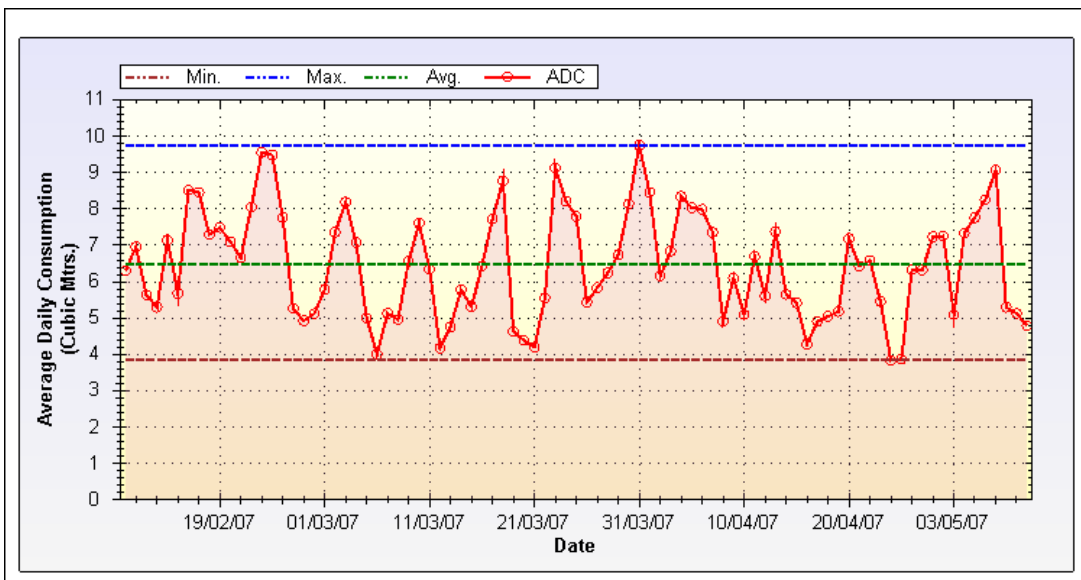


Figure 8.9 Restaurant 7.EL

- Minimum Daily Consumption: 3.840 m<sup>3</sup>.
- Average Daily Consumption: 6.468 m<sup>3</sup>.
- Maximum Daily Consumption: 9.750 m<sup>3</sup>.

- Peak consumption seems to have dropped since the end of March.
- Average consumption has also dropped slightly (by 36 m<sup>3</sup>) from the monthly total for March to that for April (counting both as 30 day months). It is too early to say if this is due to a reaction to the audit report we sent them in the form of measures taken or increased awareness, but certainly seems positive; it equates to a saving of 1.2m<sup>3</sup> per day in April compared to March.

## 8.8 Pub 24.ZL

- Started reliable monitoring 21/February/2007.
- Base Flow Minimum: Zero.
- Base Flow Maximum: 0.05 litres.
- Minimum Daily Consumption: 0.350 m<sup>3</sup>.
- Average Daily Consumption: 1.456 m<sup>3</sup>.
- Maximum Daily Consumption: 2.580 m<sup>3</sup>.

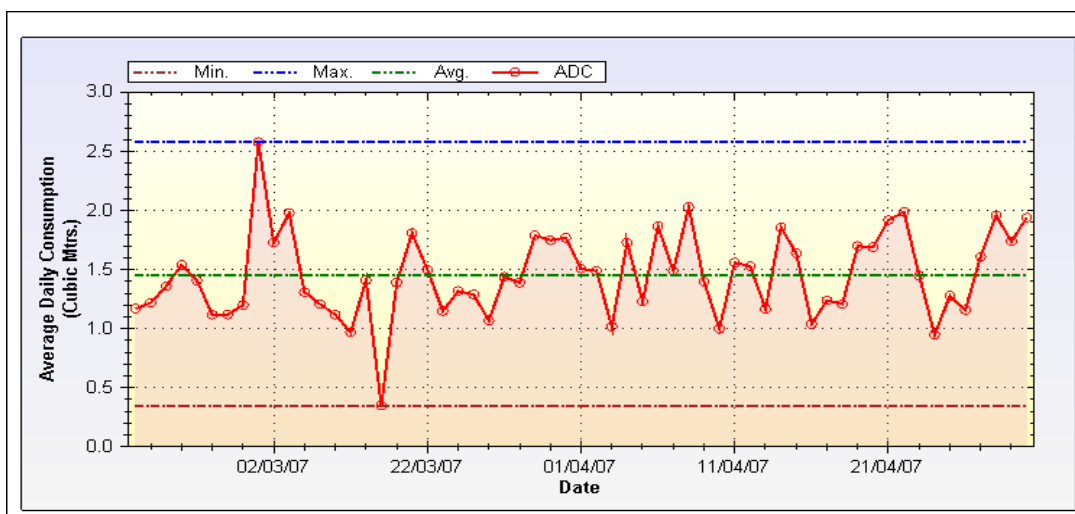


Figure 8.10 Pub 24.ZL

- Visited by the council in Sept 2006 when new owners had just taken over and had been shocked by the size of their water bill.
- This is now a very water aware pub. They took up all the council recommendations and urge staff to be water conscious.
- Spike at end of figure 8.11 could have indicated a leak but subsequent drop-off to zero consumption indicates a fault on the monitoring. The suppliers have been notified and are in the process of rectifying the fault.

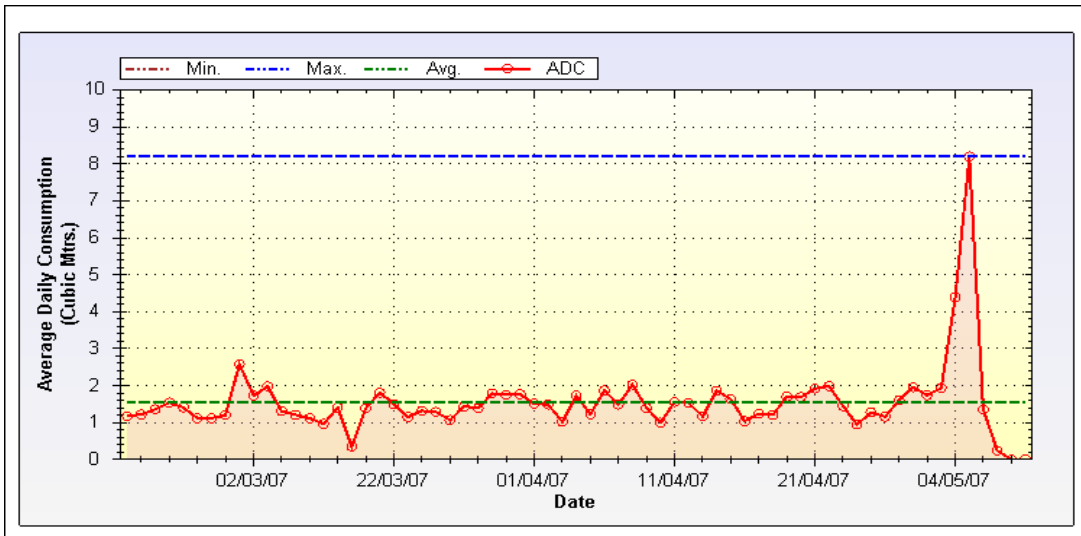


Figure 8.11 Pub 24.ZL

### 8.9 Pub 8.ELU

- Started reliable monitoring 2/March/2007
- Base Flow Minimum: 24 litres.
- Base Flow Maximum: 26 litres.
- Minimum Daily Consumption: 0.465 m<sup>3</sup>.
- Average Daily Consumption: 3.071 m<sup>3</sup>.
- Maximum Daily Consumption: 4.980 m<sup>3</sup>.

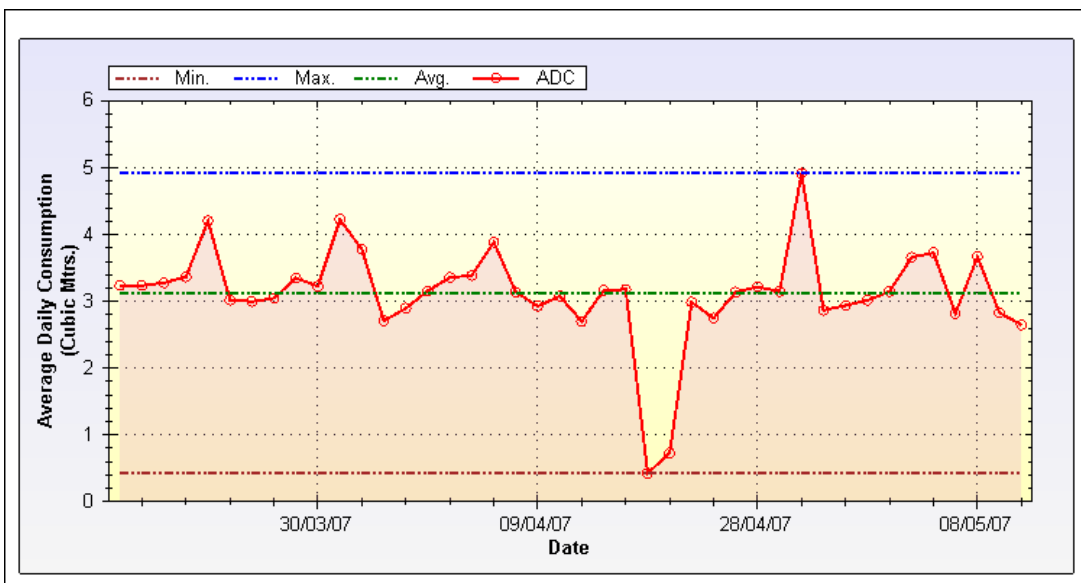


Figure 8.12 Pub 8.ELU

- Difficult to take much from the averaging graphs available, as there are points where no data is recorded.

- Very large consumption for a small public house and a high base flow rate suggest a leak on the underground pipe between the meter and the premises. Meter is sited outside the nearby public toilets rather than outside the pub itself.
- We would expect to save around 270 litres per day from the installation of urinal controls.
- Urinal controls fitted 21/May/2007. Data not analysed since controls fitted.

### 8.10 Pub 4.ELU

- Started reliable monitoring 17/March/2007.
- Base Flow Minimum: 2 litres.
- Base Flow Maximum: 45 litres.
- Minimum Daily Consumption: 0.6m<sup>3</sup>.
- Average Daily Consumption: 2.855m<sup>3</sup>.
- Maximum Daily Consumption: 6.740m<sup>3</sup>.
- A substantial leak was spotted during the initial water audit.
- This was rectified on 31/March/2007 and a noticeable drop is evident on the Daily Consumption graph below.
- However, subsequent monitoring reveals that either a new leak or a recurrence of the initial leak (occurring on 26 or 27/March/2007) is a distinct possibility; again, very evident from the sharp rise in the graph in Figure 8.13.
- As a result of this rise, average daily consumption more than tripled from **1.487m<sup>3</sup>** in the period 3/April/2007 – 25/April/2007 to **4.512m<sup>3</sup>** in the period 26/April/2007 – 9/May/2007
- The base flow rose by a staggering 28 times in this period. The management at the premises were notified as soon as we noticed this leak

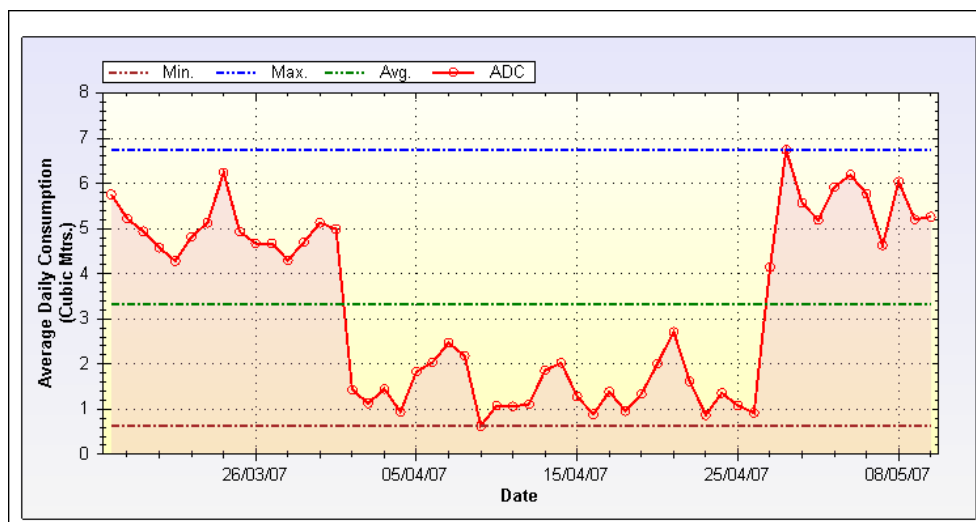


Figure 8.13 Pub 4.ELU

## 9. Conclusions

- Overall conditions for WCs urinals and taps across the hospitality sector were poor, with very few refurbishments having been carried out since 2001. (2001 was the year the maximum flushing volume was reduced to 6 litres, and 6/4 dual flush WCs were widely available on the UK Market)
- Sometimes major redecoration of premises was carried out with no comparable refurbishment of toilet areas.
- The level of water awareness within the hospitality sector was low.

### 9.1 Crawley Council audit results

- Crawley Council visited 24 premises within the hospitality sector in the summer of 2006, gave recommendations for water saving measures and estimated this would result in 1,750m<sup>3</sup> of water saved per year.
- Take up of water efficiency measures was much lower than expected.
- Actual yearly savings will be 453m<sup>3</sup> of water at best, just 18.8m<sup>3</sup> of water per premises per year

### 9.2 ech<sub>2</sub>o audit results

- ech<sub>2</sub>o carried out detailed water audits of 40 further premises within Crawley's hospitality sector and implemented water efficiency measures in suitable premises.
- There are a total of 265 WCs across the premises surveyed. Most flush with 7.5 or 9 litres of water.
- A total of 101 Save-a-flush bags were fitted during the water audits, 39% of all WCs
- There are a total of 127 urinals/urinal spaces across the premises surveyed. 57 urinals were uncontrolled.
- A total of 12 premises (nine pubs, one club and two restaurants) are having free controls fitted under the BREW project. A total of 19 urinal controls have been fitted.
- **Total savings from fitting Save-a-flush bags are 1,146m<sup>3</sup> per year.**
- **Total savings from urinal controls are 2,558 m<sup>3</sup> per year.** (Preliminary data from logging shows that actual savings will be greater as some existing uncontrolled urinals are flushing with higher flush volumes than recommended under the Water Regulations.)
- **Total savings from adjusting flow rates are 1,092m<sup>3</sup> per year.**
- **Total savings from rectifying leaks are 269m<sup>3</sup>.**
- **Total water savings from ech<sub>2</sub>o's work under the BREW project across 43 premises are 5,065m<sup>3</sup> per year.**

- Average saving is 118m<sup>3</sup> of water per premises per year
- 5,065m<sup>3</sup> of water saved is 6,078 kWh of energy saved, resulting in 2,735 kg of CO<sub>2</sub> not emitted

### 9.3 Management or financial barriers

- SEEDA were keen to understand if either management or financial barriers were an issue in implementing water saving measures.
- Some pubs and restaurants in the Crawley area are part of larger chains. This can impact negatively on implementation of installing water saving measures, especially in local projects. However, if a chain decides that water saving is a serious strategy to address, then large savings will be made across all their premises throughout the UK.
- We encountered management barriers with most of the chain pubs and restaurants. Some chain premises allowed their staff to make decisions at an individual site level but most did not. The performance of head offices in making decisions varied widely. Permission for fitting Save-a-flush bags or data loggers could not be requested given the short time scale of the project.
- As we were offering urinal controls and Save-a-flush bags supplied and fitted for free, financial barriers were not an issue during this project. However, it was clear from discussion with publicans or managers, both during the ech<sub>2</sub>o audit and the telephone survey that financial considerations were very important. In particular there was a huge amount of scepticism about how much water (and therefore money) could actually be saved by fitting water efficient devices.

### 9.4 Further water saving opportunities within Crawley

- It is clear that with further funding large amounts of water could be saved by installing Save-a-flush bags in the sites identified by Crawley Council. Particularly large savings could be made at Brannigans (club, 42 WCs), Goffs Park (hotel and restaurant, 62 WCs) and TGI Fridays (restaurant, 15 WCs). This does depend on access to the WCs.
- The data loggers will continue to transmit data for another two years. Further funding should be made available to fit a variety of water efficiency devices and then to monitor which are most effective and save the most water in this sector.

### 9.5 Success of the project

- Our core aims were:
  - ~ to undertake a detailed audit of the 40 premises not already visited to ascertain/understand where and how water is used in the hospitality sector
  - ~ to fit urinal controls in 20 premises, therefore actually saving water
  - ~ to fit data loggers to ten premises to get a more detailed understanding of where the water was being used.
- We undertook detailed audits of 37 premises, and partial audits of three premises.

- We estimated that 20 premises would not have urinal controls. This was an underestimation and not all premises wanted controls fitted. We fitted 19 controls in 12 premises. A further two controls are likely to be fitted in June.
- We fitted 10 data loggers.
- There were two other outcomes. These were:
  - ~ to raise the profile of saving water in Crawley by publicising what we were doing
  - ~ to enable other local councils to know what worked and what didn't work.
- These aims were completed successfully and will continue after the end of the project.

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<sup>1</sup> The original remit was for 40 premises. As urinal controls were fitted in three extra premises outside of the original 40 premises, but identified during the project, savings from these sites have been added to the overall data. (Page 5)

<sup>2</sup> It was unclear how the council had arrived at these figures and requests for information were not answered. (Page 9)

<sup>3</sup> Calculated at £1.24/m<sup>3</sup>. 2006 prices for water supply from Southern Water and sewage treatment from Thames Water. (Page 10)

<sup>4</sup> Feedback from one publican who owned two pubs in the Crawley area and had a council survey in one and an ech<sub>2</sub>o survey in the other was that the survey carried out by ech<sub>2</sub>o was far more useful than the council one because we "got on the job without bothering him" and "fitted the Save-a-flush bags which I had not had time to fit in my other pub." (Page 14)

<sup>5</sup> We estimated 50m<sup>3</sup> of water saved per year in each of the pubs that had fitted Save-a-flush bags. We estimated 120m<sup>3</sup> per premises for urinal flushing a year. This was based on four urinals per premises. (Page 15)

<sup>6</sup> Three sites did not benefit from a full survey: Pub 19.E did not want us to arrange a second visiting time after we were unable to make the first. Pub 21.E and Takeaway 3.E did not want us to visit. We sent the latter two a water audit working on the information they gave us over the phone. Restaurant 3.Z is a restaurant originally visited by Crawley Council. During the telephone survey the restaurant was identified as one that would benefit from urinal controls. As we had to visit to check for suitability, we then carried out a detailed survey and this restaurant is included in the data of the 40 sites visited. (Page 17)

<sup>7</sup> No figure shown indicates that data was unforthcoming, either by phone or by site survey. (Page 22)

<sup>8</sup> No figure shown indicates that data was unforthcoming, either by phone or by site survey. (Page 23)

<sup>9</sup> One pub did not want us to fit the signs. We fitted the Save-a-flush bags none the less. (Page 27)

<sup>10</sup> Pub 2.E had fitted eight Save-a-flush bags following council recommendations from an undocumented visit. (Page 28)

<sup>11</sup> We are counting the savings from these premises as coming from the BREW funded surveys. Urinal controls would not have been fitted in these premises if a) the funding had not been available (all three cases) and b) if the proprietors had not meet ech<sub>2</sub>o during the survey of subsequent premises and had identified their own premises as being without urinal controls (two of the three cases). (Page 29)

<sup>12</sup> The original remit was for 40 premises. As urinal controls were fitted in three extra premises outside of the original 40 premises, but identified during the project, savings from these sites have been added to the overall data. (Page 35)

## Appendix A

**Owner  
Address**

**Name of premises Pub  
Visited: 9<sup>th</sup> Jan 2007**

Feb 19<sup>th</sup> 2007

Dear xxxxx,

Thank you for allowing us to visit your premises to carry out a water audit as part of the *Crawley Saving Water* project. As you have been informed, such audits ascertain where and how water is used, subsequently allowing us to pinpoint potential opportunities to modify existing water consuming facilities and appliances, or implement new measures to improve water efficiency.

By agreeing to be part of this project your premises is most likely to consume less water. This should benefit your business through a reduction in water bills, as well as the wider Crawley area, which has seen water resources increasingly stretched in recent years.

Following the visit of myself and Cath Hassell, this report has been compiled to provide an analysis of water use in your property: It details water saving measures performed during our audit, suggests any further improvements you could make (including any funded under this programme), and indicates how much water and money could be saved from these measures.

=====

### General Overview

Your water consumption last year was 600 m<sup>3</sup> and bills were £724.

### WCs

Your WC's have a maximum flush volume of 9 litres, meaning they were most likely fitted before 1991, when the limit for new installations was reduced to 7.5 litres (It was subsequently further reduced to a maximum of 6 litres under the Water Supply (Water Fittings) Regulations 1999). Your disabled WC has a maximum flush volume of 7.5 litres.

### Actions Taken During Audit

As was explained during the audit, most toilets are capable of flushing quite ably with less water. With your agreement we fitted 'water-savers' to the customer WC's in your premises. This simple measure means that 1 litre of water is saved with every flush.

Though you were unsure of average customer numbers, indicative savings from this measure can be made if we assume that these WC's are used just 30 times per day (to account for the differential use of men and women and the duration of peoples' visits). From this calculation, weekly savings are 210 litres of water and yearly savings are 10.94m<sup>3</sup> (This is a saving of about 11% on previous consumption of water for WC flushing).

### **Urinals**

Urinals fitted with controls only flush when the premises are in use. As your premises are open 7 days a week from 12p.m to 11p.m, there is a shut down period of around 13 hours every day. With a trough urinal (equivalent to 2 bowl urinals) flushing at an average of 15 litres per hour (the maximum allowable under the Water Supply [Water Fittings] Regulations 1999), the amount of water it can be estimated that urinal controls would save is around 194 litres per day, 1,361 litres per week and 70.74m<sup>3</sup> a year (equating to a saving of around 54% on current, uncontrolled use). We have earmarked your pub for the potential funding to install urinal controls; you may be contacted separately regarding this.

### **Taps at Wash-Hand Basins**

The xxx xxx has manually controlled taps. Whilst hot taps in both the male and female toilets have flow rates within sensible limits, cold taps can be excessive, using between 9 and 15 litres of water per minute.

A flow rate of 4 litres per minute in washbasins in a commercial setting is adequate.

### **Actions Taken During Audit**

No work could be undertaken during our visit, as there were no isolating valves to adjust on the taps with high flow rates.

### **Further Water Saving Opportunities for Wash-Hand Basins**

Although access to plumbing works was limited, it would be worth considering replacing existing taps with flow regulated ones in any refurbishment. Unfortunately there is no funding for this under the present scheme, but you could certainly save water and money by pursuing this option. Flow Regulators provide constant and maximum flow rates irrespective of changes in demand (for example, all the basins in a toilet being used simultaneously) or water pressure fluctuations. They can save up to 50% of the water used by conventional taps and prevent 'splash back' from basins onto customers.

Percussion taps could also be fitted throughout, preventing customers unwittingly leaving taps running.

### **Sinks in Catering and Bar Areas**

Though your kitchen is not used commercially, high flow rates up to 10 litres per minute were measured from the manually operated cold taps in these areas. Whilst there were no adjustments that could be made during our visit, we do recommend you consider measures raised in the section above in any refurbishment projects. A flow rate of 6 litres per minute is adequate in a commercial kitchen.

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### **How Much Water and Money Could You Save?**

Around 50% of water from taps could be saved if flow regulators are installed.

Around 11% (10.94m<sup>3</sup>) of the water used annually for customer W.C flushing will be saved because of the water savers we fitted.

Around 50% (98.25m<sup>3</sup>) of the water used to currently flush urinals could be saved as a result of the urinal controls we have suggested.

You informed us that you were billed by Southern Water for your mains water and Thames Water for your waste water; this equates to a cost of £1.24p per m<sup>3</sup> at 2006 prices

*This means that by taking the water saving measures outlined above, your business could save approximately £135.40p per year.*  
(109.19m<sup>3</sup> saved from WC water savers and urinal controls multiplied by £1.24p per m<sup>3</sup>; this is calculated without the potential savings from flow regulated taps)

Once again we thank you for your time, enthusiasm and cooperation. We hope this report has proved interesting and useful to you; please do not hesitate to contact us if there is any further advice or service we might provide for you in the future.

Kindest Regards,

Ben Coombes.

**This audit was carried out as part of the Crawley Saving Water project. The project was funded by SEEDA and run by ech2o on behalf of Crawley Council**