ESSEX & SUFFOLK WATER

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Essex & Suffolk Water

H_2eco Phase III – Pilot Study

September 2009

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Project Title	**H_2eco Phase III – Pilot Study**
Report Title	**Final Report**
Revision	**Version 2**
Status	**Final**
Control Date	**September 2009**

Record of Issue

Issue	Status	Author	Date	Check	Date	Authorised	Date
1	Draft	JT	June 09	RH	June 09	RH	Jul 09
2	Final	JT	Sept 09	RH	Sept 09	RH	Sept 09

Distribution

Organisation	Contact	Copies
Essex and Suffolk Water	Tom Andrewartha	1 hard copy 1 x Electronic copy on CD ROM
Mouchel	Jenny Taylor	1 hard copy 1 x Electronic copy on CD ROM

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Table of Contents

Executive Summary ..... **vi**

1 Introduction **1**
1.1 The Area and its Composition 2
1.2 Aims and Objectives 4

2 Programme Approach **6**
2.1 Project Development in Phase 3 6
2.2 Customer Engagement 7
2.3 The Self Audit Process 8
2.4 Products and Services Offered 10
2.5 Prize Draw 15
2.6 Sustainability 15
2.7 Publicity 15
2.8 Customer Contact 16
2.9 Collection of Customer Information 17
2.10 Delivery Techniques 21
2.11 Collecting Meter Reading Data 23
2.12 Database 23
2.13 Project Management 30
2.14 Staff Training 31

3 Results **33**
3.1 Number of Customers Contacted and Audits Completed 33
3.2 Patterns in Which Customers Participated 38
3.3 Number of Products Supplied and Fitted 44
3.4 Patterns in Suitability of Products 47
3.5 Products Not Fitted 47
3.6 Customer Satisfaction 48

4 Water Savings **50**
4.1 Calculated Savings from Each Product Supplied 50

5 Reporting **53**
5.1 Weekly Reports and Meetings 53

6 Project Costs **54**
6.1 Cost per Property 54
6.2 Overall Costs 54

7 Evaluation of the Programme **58**
7.1 Cost/Benefits of Individual Audit Products 58
7.2 Evaluation of Which Products should be Included in Future Projects 59
7.3 Demonstration of Success of Programme Design Method 60
7.4 Recommendations 61
7.5 Innovation 62

DRAFT

8 Conclusions 64

9 Appendices 67

9.1 Appendix A: Introductory Letter 68
9.2 Appendix B: Workbook 69
9.3 Appendix C: Audit Pack Contents 75
9.4 Appendix D: Reminder Letter 79
9.5 Appendix E: Water Savers Report 80
9.6 Appendix F: Supporting Letter for Water Savers Report 81
9.7 Appendix G: Completed Audit Sheet 82
9.8 Appendix H: Weekly Report 83
9.9 Appendix I: Invoice Report 84
9.10 Appendix J: Assumptions 85
9.11 Appendix K: Customer Satisfaction Survey 86
9.12 Appendix L: Unit Costs 87

DRAFT

List of Tables

Table 1: Key Project Dates 1

Table 2: Products Offered 11

Table 3: Details of Audit Questions 18

Table 4: Additional Call Results 34

Table 5: Summary of Customer Contact 35

Table 6: Distribution of Applications Received, Appointments Booked and Audits Completed 36

Table 7: Time from Customer Contact to Appointment 37

Table 8: Summary of Customer Responses 38

Table 9: Dishwasher Usage 40

Table 10: Dishwasher Age 41

Table 11: Washing Machine Usage 42

Table 12: Washing Machine Age 43

Table 13: Quantities of Products Suggested/Fitted 44

Table 14: Quantities of Products Fitted 45

Table 15: Quantity of Different Types of Product Installed 46

Table 16: Product Costs Against Quantities Fitted 46

Table 17: Success Rate for the Installation of Products 47

Table 18: Responses from Customer Satisfaction Survey 48

Table 19: Water Savings 50

Table 20: Overall Project Costs 54

Table 21: Breakdown of Project Management and Key Workstage Costs 55

Table 22: Meter Reading Costs 55

Table 23: Initial Estimates and Actual Times Required for Fitting Plumbing Products 56

Table 24: Cost Per Product and Number of Each Product Fitted 56

Table 25: Other Costs 57

Table 26: Cost/Benefit of Products 58

Table 27: Assessment of Individual Products 60

Table 28: Advantages and Disadvantages of PDA use. 63

Table 29: Key Water Savings Data 65

DRAFT

List of Figures

Figure 1: Location of Chelmsford, Essex 2

Figure 2: Boundary for H_2eco Phase III Project 3

Figure 3: Initial Log In Screen 24

Figure 4: Customer Stages 25

Figure 5: Customer Liaisons 26

Figure 6: Workbook Entry Screen 27

Figure 7: Appointment Booking 28

Figure 8: Plumber Audit Sheet 29

Figure 9: Customers Initial Response to Invitation and Appointment Scheduling 37

DRAFT

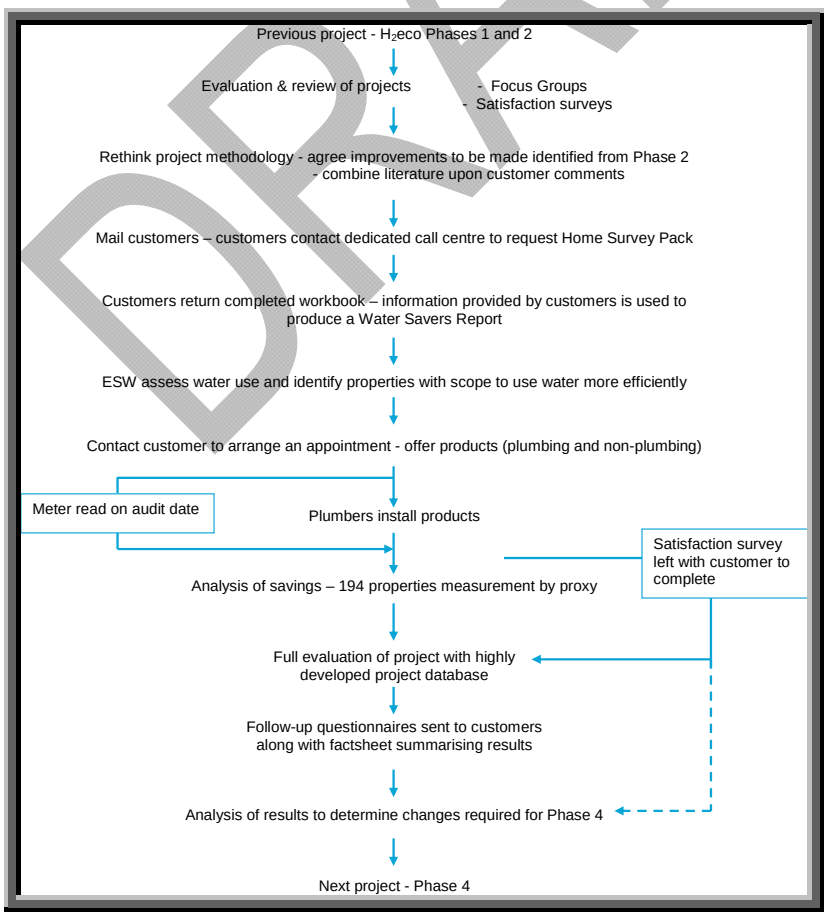
Executive Summary

H_2eco are a series of water efficiency studies conducted by Essex & Suffolk Water (ESW) focusing on the installation of water efficient devices within domestic properties. Phase 3 of H_2eco is the third study in this series. It is a continuation of ESW's very successful long term water efficiency home audits programme based within Chelmsford, Essex. ESW joined forces once again with Mouchel to deliver the project which was to contribute to the Government's target to reduce water use across the country from around 150 litres per person per day to 120 litres per person per day by 2030 (Defra – Water Strategy, Future Water 2008).

In keeping with the previous Phases ESW endeavored to improve domestic water efficiency by offering the latest water saving products and raising their customer's awareness of the importance of reducing water wastage. Phase 3 drew on a vast resource of experience from the previous two Phases of H_2eco and past water efficiency projects to make innovative developments to the way that ESW and Mouchel deliver water efficiency projects.

The flow diagram below summarises the stages of the project.

Project Stages



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The following table provides the key results from the H_2eco Phase 3 project providing results of customer contact, audits that were completed and the relevant split between metered and non-metered customers. Also shown is a summary of quantities of each product fitted and the water saving of the product, averaged over all 194 properties that completed an audit.

Key Results

Key Result		
Total Customers Invited to Participate	2492	
Applications Received	252 (10.11% of those invited)	
Metered vs. Unmetered	(Of those that had a completed audit) 161 were Metered (82.9%) 33 were Unmetered (17.1%)	
Audits Completed	194 (76.7% of Applications Received) (7.78% of those invited)	
Product	**Quantity Fitted**	**Average Water Saving (L/prop/day)**
ecoBETA	51	39.52
Aerated Shower Head	34	29.59
Save-a-Flush	111	12.03
Tap Insert	71	16.42
Miracle Tap Adaptor	97	10.34
Tap Re-washering	14	5.60
Bath Measure	73	5.03
Shower Timer	194	2.45
Water Butt (standard)	104	1.97
Water Butt (mini)	60	1.04
Hose Gun	87	1.51
Crystals	59	0.054
Children Detective kit	61	Undetermined
Shower Flow Bag	630*	Undetermined
Savings		**33.08 l/prop/day****

* One bag sent with every pack ** Figure derived from an average of total saving per property per day from all participating properties.

The saving achieved for the third phase of the H_2eco study of 33.08 l/prop/day was a good average saving in comparison to previous water efficiency studies.

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1 Introduction

Following on from H_2eco Phase 2, ESW and Mouchel employed innovative and progressive techniques in the Phase 3 pilot study of H_2eco to further develop the existing structure. Although excellent results had already been experienced, ESW aimed to improve on these further. From H_2eco Phase 1 (Dec 07 – May 08) and Phase 2 (May 08 – Oct 08), some aspects of the project were identified where developments could be made. The main driver for this was to increase the accuracy and value of the information supplied by the customer.

Phase 3 continued to focus on the 'recruitment' of customers. The style of the 'self audit' process was retained and refined and the workbook style application form was redesigned. The thirteen products and services made available to households taking part were retained from Phase 2. From previous water efficiency projects ESW and Mouchel have refined the products offered to use those offering the greatest water savings balanced against cost, efficiency, ease of installation and lifespan. The project operated between January and April 2009 with a relatively short period of audits held over three weeks. Key dates in the project can be seen in Table 1.

Table 1: Key Project Dates

Activity	Date
Initial Introductory Letter to Customer	29 January 2009
Reminder Letter Sent to Customer	13 February 2009
Start of Plumbing Audits	2 March 2009
Deadline for Return of Workbook	16 March 2009
End of Plumbing Audits	27 March 2009
Calculation of Water Savings	3 April 2009
Submission of Final Report	22 September 2009

The number of properties invited (2,492) to take part was around 35% of the previous two Phases. By operating the project as a pilot study over a smaller group, all aspects of the project could be closely analysed for potential developments and improvements in preparation for the next full size study.

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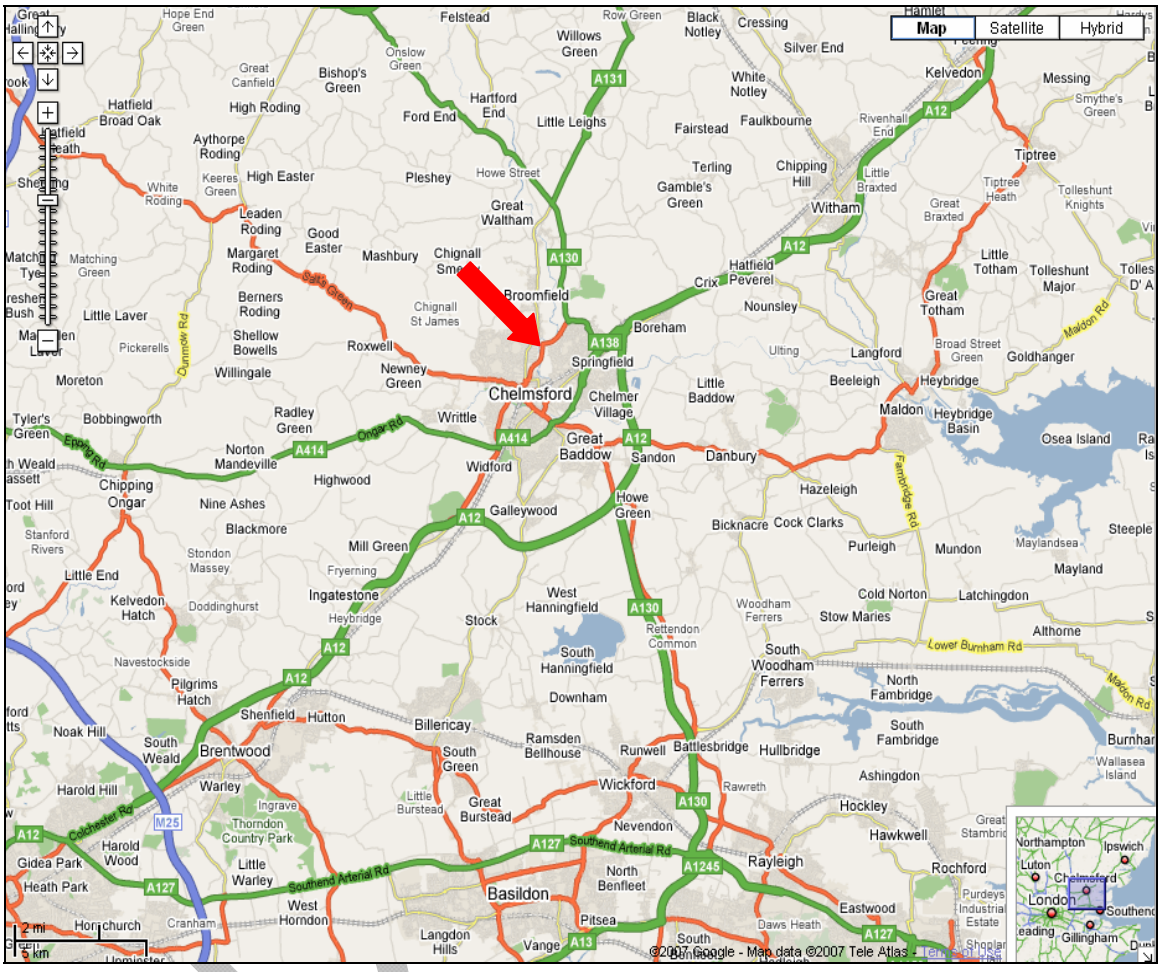
1.1 The Area and its Composition

Figure 2 shows the geographical location for the study area for H_2eco Phase 3, based in Chelmsford, Essex.

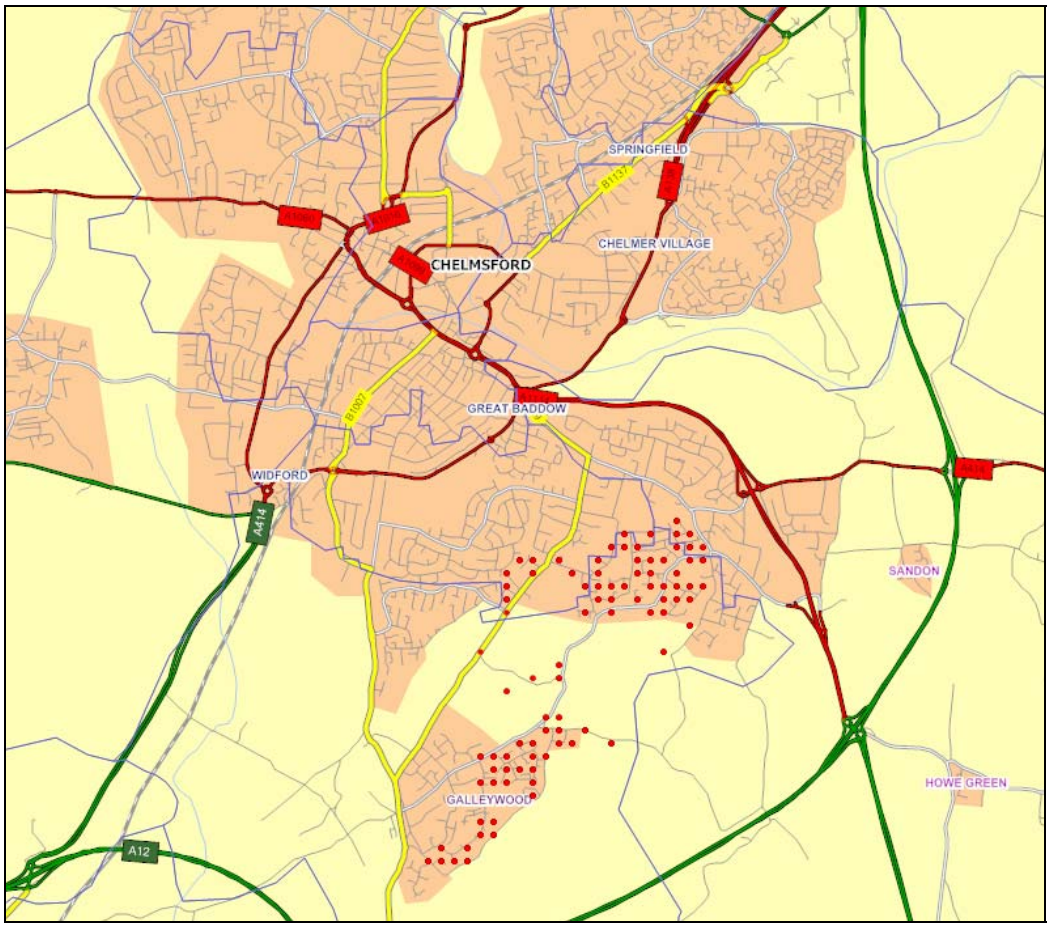
Figure 1: Location of Chelmsford, Essex



The study area for H_2eco Phase 3 pilot was based in two Demand Management Areas in the Southern part of Chelmsford, Great Baddow and Galleywood. This area was chosen as the majority of Chelmsford had been covered by previous phases of H_2eco. 2,492 properties within these areas were sent the Introductory Letter offering them the chance to participate.

Figure 2 shows a more detailed map of the study area within Chelmsford. The Great Baddow and Galleywood areas are marked by the red dotted area.

Figure 2: Boundary for H_2eco Phase III Project



1.2 Aims and Objectives

The main aim of the H_2eco Phases has been to engage the customer into water efficiency through following a self audit process leading to the supply or fitting of various water efficient products. The purpose of the Phase 3 Pilot study was to provide the opportunity to learn from the approach adopted in Phase 3 and contribute towards a structured plan for a fourth phase of ESW's water efficiency audits

At the beginning of the first Phase of H_2eco ESW presented a number of objectives and requirements, these were carried forward to the second and third phases of the H_2eco studies.

- To maximise water savings.
- To ensure that all the requested data is captured.
- To be able to demonstrate robustness in the results.
- To collect data to enable water savings to be quantified and all aspects of the project to be fully evaluated for contribution to water saving, customer satisfaction, economics, reliability/performance of products, plumbing issues and contractor performance.
- To engage customers and ensure satisfaction (within reason) to encourage continued water efficiency.
- To demonstrate innovation and cost effectiveness.
- To maintain ESW's position as the leading water company in water efficiency.
- Identify/improve the methodology to be applied to Phase 3.

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The purpose of all of the H_2eco projects continuing into Phase 3 has been to encourage customers to think about the water they use and how they could reduce the amount they waste. The project was designed to collect information on water consumption and usage patterns through a cross section of residential consumers.

Thirteen products and services were available to customers participating. The products that best suited each household's individual circumstances were selected by Mouchel's qualified plumbers and the customer at the time of the audit. All work to install the products (where required) was completed by the plumber free of charge to the customer.

Information on toilets, taps, showers baths, washing machines, dishwashers, the garden, and car washing was collected by the customer prior to their audit alongside demographic information on each household.

The data collected was to be used to:

- Suggest potentially suitable products and services for the customer's home via a 'Water Savers Report' (a personalised report issued to the customer detailing water use and potential water savings prior to the installation of products. Explained further in Section 2.4.1).
- Determine calculated volumes of water saved as a result of installing the products.
- Identify which types of water saving product were most suitable for installation in domestic properties.
- Establish the overall cost of the products and services in relation to the volumes of water they were able to save.

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2 Programme Approach

Developing the project methodology was a key focus of Mouchel and ESW. For the Phase 3 study the audit process followed a sequence of stages, these are explained in the following chapter.

The significant events from these stages are detailed below:

- An Introductory Letter is posted to customers.
- Customer requests a 'Home Survey Pack'.
- The 'Pack' is posted to the customer.
- A completed Workbook is returned to Mouchel.
- The data from the Workbook is entered onto the project database.
- The 'Water Savers Report' is produced and sent to the customer with an accompanying letter.
- The customer is contacted to arrange an appointment for products to be fitted.
- A confirmation letter of the appointment is posted to the customer.
- An Audit Sheet detailing products and customers details is produced and emailed to the Plumber.
- The Plumber visits the customer's property to fit suitable water efficient products.
- The Plumber returns the Audit Sheet to Mouchel for the data to be entered onto the database.
- Water savings are calculated.

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2.1 Project Development in Phase 3

From experiences gained from the previous phases of H_2eco and past water efficiency projects, customer engagement and communication are essential to maximising customer response. At the close of Phase 2, a feedback session was held with site staff where any issues that they had identified could be raised and recorded to assist with the development of the Phase 3 study. Administrative and operational issues from Mouchel were also addressed and changes suggested for the next phase.

2.2 Customer Engagement

Through results from previous water efficiency studies it had been found that not involving the customer in the audit process had detracted from the customer experience and made them less likely to encourage neighbours and family members to take part. Changes were identified that would improve the audit process, maintaining the customer involvement. There was a possibility that customers could be less likely to make long term behavioural changes themselves if not involved in the audit process. Utilising the 'self audit' process enhanced the customers understanding of the aims of the project and gave them greater awareness of their water use.

2.2.1 The Introductory Letter

On 29th January 2009, 2,492 homes within the Great Baddow and Galleywood areas of Chelmsford were sent an Introductory Letter inviting them to take part in the third phase of the H_2eco study. The properties were within the postcode areas of CM2 (7HH – 7SU, 8DE – 8YY and 9NB – 9UF). See Figure 2, (Section 1.1).

The letter gave key pieces of information about the project and invited the customers to contact the project hotline to request a 'Home Survey Pack'. ESW and Mouchel estimated that approximately 1,000 applications to receive the 'Home Survey Pack' would be received and approximately 500 completed workbooks would be returned. To ensure a greater level of customer uptake, a change was made to the introductory letter. Instead of sending a pack to everyone in the project area, the letter asked if customers were interested in finding out more about H_2eco, taking part in the project and saving water, they could contact the project 'hotline' to request that a 'Home Survey Pack' be sent to them. By only sending packs to customers that wanted them, the chances for completed workbooks being returned were increased. This approach was used to reduce waste and the quantity of pack contents that may end up in landfill, thereby enhancing the environmental credentials of the project.

2.2.2 The Home Survey Pack

The 'Home Survey Pack' (Appendix C) contained all of the materials required by the customer to complete a 'Self Audit' of water use within their home.

The 'Home Survey Pack' contained:

- The H_2eco Phase 3 workbook
- Prepaid reply envelope
- A leaflet explaining the 'Red Letter Days' prize draw
- Shower Flow Bag
- Dripping Tap Gauge
- Tape Measure
- Pen
- ESW Tea Towel

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A H_2eco branded pen was included so that the customer had something straight away to fill out the booklet. The Shower Flow Bag enabled the customer to measure the flow rate (litres per minute) of all of their showers. The Dripping Tap Gauge measured the flow rate (litres per day) for dripping taps. The tape measure was included to enable customers to measure their toilet cistern dimensions and average water depth to which they fill their baths. The tape measure was made from paper so it could be recycled. An ESW tea towel was included in the pack as a gift with information about saving water.

Past phases had included the 'pack' with the first mail shot to customers. In these phases the items within the pack were included to gain customers interest and encourage them to take part. After Phase 2 it was apparent that only sending packs to customers that had requested them would be a more efficient method for this early stage of the project. A saving in resources and costs would be achieved by reducing the number of packs not returned.

2.3 The Self Audit Process

The original idea for the workbook style form of questionnaire was developed in late 2007 in Phase 1 of H_2eco. Through the following two Phases the design has evolved, predominantly from information gathered in the feedback sessions and experiences throughout the projects.

The workbook was designed to guide the customer through a series of questions regarding water use within their home. These were split into sections, focusing on toilets, taps, baths & showers, the kitchen and outdoor areas, (Appendix B). Included in each section was information to prompt the customer should they require assistance to answer a question.

2.3.1 Redesign of the Workbook

For the Phase 3 study, the questions included in the workbook were altered so that their main purpose was to gather qualitative data on the customer's home (Appendix B). This data was then utilised to select products which may be suitable for the customer's home. Due to erroneous data provided by some customers on the previous Phases it was felt that more accurate results and useful information may be attained by the plumber during the audit. By changing this process, the plumber could take the time to explain to the customer each of the products and potentially be able to fit products that the customer may have thought they were unable to have.

In Phase 2 there was some evidence from analysis of the completed workbooks that opportunities for installation of products were being missed. The Phase 2 style of workbook outlined all of the available water saving products and incorporated questions enabling customers to order specific products.

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A trend was observed that some customers were either ignoring sections of the workbook or answering all the questions but then not ordering the product. The most likely reasons for this appeared to be either human error (the question had been missed) or the customer chose not to order a particular product. Despite including explanations of each of the products there was some evidence that some of the more technical products such as the ecoBETA may have been avoided by customers through a lack of understanding of the product and how it functioned. The solution to this was to alter the process so that products could be suggested for the customer, rather than the customer ordering them.

Also added to the questions were sections on washing machines and dishwashers. These questions were included to find out how many customers would be likely to change their appliances in the near future. The information gathered was used to find out whether the inclusion of a 'voucher' towards new appliances would encourage customers to replace old appliances. As washing machines and dishwashers can account for a large proportion of a households water use a new section of questions was added regarding this. This section identified which customers own dishwashers and washing machines, they're usage habits, the age of the machines and plans for replacement.

To further assist customers with understanding questions, diagrams, examples and sections of additional explanations were also included at key stages within the workbook.

Using the items sent to the customer within the 'Home Survey Pack' the customer was able to move around their home collecting the information required to complete the workbook. The primary purpose of the workbook was to collect accurate and useful data to enable Mouchel to produce a suggested list of suitable products within the 'Water Savers Report'. The accuracy of the data collected by the customer was also key to ESW's analysis of water use habits by their customers.

2.3.2 The Workbook Structure

The first section of the workbook requested information of the inhabitants of the household, including their ages. In this section of the Workbook the customer could opt to receive their Water Savers Report via email or post. A project email address (ESWater.H2Eco@mouchel.com) was set up to enable reports to be emailed to customers and to reduce the quantity of paper used. By providing the email option it also demonstrated to customers that ESW took the issue of waste and recycling seriously.

In the 'General' section of the workbook questions were asked regarding taps within the home. The Dripping Tap Gauge could be used here to measure flow rates of dripping taps. To establish the suitability of toilets for the ecoBETA or Save-a-Flush an extensive section on 'Toilets' covered toilet location, cistern dimensions, flush type and position and age. To improve the quality of data received back, diagrams were included and

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also a completed example to show the customer what sort of information was required. The tape measure provided in the survey pack made it easy for customers to collect this information.

From Phase 2 there were some comments fed back that the shower section of questions was a little complicated for customers to follow. In response to this the questions within this section were simplified but still collected the essential information required to assess potential suitability. The shower flow bag provided in the survey pack enabled the customer to collect a flow rate for their shower. To increase accuracy of data, the customer was asked to collect three flow measurements and then calculate an average, the instructions for which were printed on the bag.

Using the tape measure provided for measuring the toilet cistern, the customer was also asked to measure the depth of water that they would usually fill their bath to. This section mainly focused on the occurrences of recycling/re-use of the bath water. The information collected was used in the Water Savers Report to calculate the customer's total water use using width and length measurements of the bath.

The final section of the workbook collected information on the garden and water habits and also vehicle washing. Once the workbook was completed the customer sent it directly to Mouchel for entry into the project database.

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2.4 Products and Services Offered

Once the customer had returned their completed workbook, the data provided was used by the database to suggest water saving devices that may be suitable for the customer's home. A 'Water Savers Report' was designed, to be sent to the customer showing the products.

2.4.1 The 'Water Savers Report'

The 'Water Savers Report' (Appendix E) was designed specifically for H_2eco Phase 3 to be sent out to the customer after they had returned their completed workbook. The report was designed as a new innovation to the H_2eco series of audits. Using the information provided, the report produced a personalised saving for each customer with additional predictions for metered customers of financial savings. The report comprised two pages that showed the products that may be suitable for the customer to receive, with an explanation about the product and the potential water savings from that particular product. The answers provided by the customer determined which water saving products would be suggested by the project database (Section 2.12).

The report showed the products that may be suitable for the customer to receive, with an explanation about the product and the potential water savings from that particular product. Information on the customers previous years water use was included along

with a detailed chart to show their level of water use. Once the report had been sent out, the customer was informed that they would be contacted in the next few days to arrange an appointment for a Mouchel plumber to call and go though the items that may be suitable. Customers were given the option of either having their report posted or emailed to them.

The inclusion of the report was a major development from Phase 2 and one of its main purposes was to reduce occurrences where products were unsuitable for a property and could not be fitted. The report aimed to further encourage customer engagement and understanding of the effects of the products installed in their homes. The report replaced the process of customers ordering products and attempted to reduce occurrences of products not being fitted. Where products could not be fitted there was a possibility that this could detract from the customer's experience of the project and alter their opinion of saving water. It was important that this was avoided as it was counter productive to the objectives of the project.

2.4.2 Products

Table 3 shows the products that were available to the customer. All items were either termed plumbing or non plumbing dependent on the type of installation required. If a plumber was required to fit the product it was a 'plumbing' item and 'non-plumbing' if a plumber was not required.

Table 2: Products Offered

Area	Product	Limit per property	Plumber fit
Children	Detective Kit	No limit	N
Garden	Crystals	3 packets per property	N
	Water Butt	1 per property	N
	Hose Gun	1 per property	N
Toilets	ecoBETA	1 per toilet	Y
	Save-a-Flush	1 per toilet	Y
Taps	Kitchen Tap Insert	No limit	Y
	Tap Inserts	No limit	Y
	Tap Re-washering	No limit	Y
Shower & Bath	Aerated Showerhead	No limit	Y
	Bath Measure	1 per property	N
	Shower Timer	1 per property	N
	Shower Flow Bag	1 per property	N

Further information on the products available is provided below.

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Children's Detective Kit

The children's detective kit contained an origami game, an interactive CD-ROM, a pen, magnet, beaker, flannel, colouring pencils and a water cycle colouring sheet. There was also a leaflet on how to save water around the home and in the garden. The aim of the pack was to encourage children to get involved in saving water around the home. The kit was presented to the customer in a paper bag, resulting from customer comments and for environmental credentials of the project. When the plumber delivered the kit the householder was shown the contents and asked if they had any questions. There was also the chance for the children to win £30 WH Smith vouchers. To be entered into the competition the child had to complete and return a questionnaire on their water use and draw a poster about 'what water efficiency in the home means to you'.

Water Crystals

The water crystals are used by mixing with soil or potting compost in pots or hanging baskets. They work by absorbing water and then slowly releasing as the plants require it. As less water drains through the plant pot, less frequent watering should be required. The water crystals were pre packaged into sachets. Each sachet was sufficient for one plant pot or hanging basket. There were instructions for use on the pack and this was highlighted to the customer when the products were delivered. Three sachets of water crystals were supplied to each suitable household.

Water Butt

Two sizes of water butt were made available. Either a 190 litre water butt or a space saving 100 litre water butt was delivered with stand, a child-safe lid and either a down pipe diverter or linking kit to join to an existing water butt. Due to the size of the product, the water butt kit was not delivered by the plumbers. If a customer had ordered a water butt, a plumber was required to undertake an inspection to determine if the water butt could actually be fitted to a down pipe. This aimed to minimise water butts being ordered and not used as they could not be fitted and possibly used or resold elsewhere. The plumber checked the suitability of the property at the time of the audit. The size of water butt was decided by the customer with advice from the plumber. Once selected, an email was sent to ESW to place an order with the supply company. The water butts were delivered by Water Group Promotions PLC via Parcel Force to the customer approximately 1 - 2 weeks later for installation by the customer. Mouchel and ESW were able to monitor delivery of the water butts online and also log any issues that may have arisen.

Hose Gun

The trigger hose gun is an attachment that fits onto the end of the hose and allows the flow of water to be stopped (via a gripped lever built into the handle) instantly when moving around the garden or washing the car. The hose gun has five different settings changed by twisting the end of the spray head offering alternative spray patterns and a catch to keep the lever depressed when continuous flow was required. The hose gun was handed to the customer along with any other products that they ordered.

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ecoBETA

The ecoBETA is a retrofit plumbing product used to convert standard toilets into dual flush toilets. The product is WRAS (Water Regulations Advisory Scheme) approved and works by introducing air and interrupting the siphon effect when the handle is pressed and released. The ecoBETA clips to the side of the siphon and a small pipe, attached to the ecoBETA is fitted to a hole drilled into the top of the siphon. If the toilet is flushed and the handle held down, the full volume of water in the cistern is delivered and the ecoBETA is bypassed, if flushed and released quickly, a reduced the volume of water is delivered. The actual volume delivered during the reduced flush is determined by the height on the siphon that the product is positioned with respect to the full water level i.e. the higher the product the smaller the reduced flush delivery volume. There were some limitations to the type of cistern and siphon that the ecoBETA could be fitted to. The cistern needed to be low level, (not the older style overhead cistern), the flush handle had to be positioned on the front of the cistern but could be on either the left or right (flush handles positioned on the side or push button flushes were not compatible). The cistern also needed to be of a standard depth (front to back), not mini, to allow the ecoBETA enough room to function without the ball valve arm becoming obstructed. In a few cases the siphon was old and brittle and would not have withstood the hole being drilled into the top without cracking. In these cases, the plumber advised the customer of the reason why the ecoBETA could not be fitted.

Save-a-flush

The Save-a-flush bag displaces water inside a toilet cistern. The bag swells to a one litre capacity, which reduces each subsequent flush by one litre. The Save-a-flush was not suitable for toilets with a flush volume of less than 7 litres. Although the Save-a-flush did not require any plumbing to fit the product it was decided to include it in the items fitted by the plumber so savings could be accurately measured from it. For best savings the bag was positioned on its end between the siphon and the outside wall of the cistern to ensure as much water in the cistern was displaced as possible.

Miracle Tap Adaptor

The kitchen tap insert used was the multi directional aerator attachment called the Miracle Tap Adaptor. The adaptors were installed by plumbers and could be fitted to a combined hot and cold outlet in either the kitchen or utility room. The customer could alter the flow from the adaptor between aerated or spray by twisting the end of the adaptor. The aerator kit contained several adaptor rings which allowed the aerator to be fitted to most taps. The flow rate in litres per minute was recorded before and after fitting to allow calculations to be made on the water saving capability of the product.

Tap Inserts

A tap insert used was manufactured by Tapmagic and reduced the flow of water through the tap. The insert worked by restricting the flow to a fine spray for hand washing but could be bypassed when the tap was turned on fully. The insert designed to replace the original tap insert utilised a diaphragm type valve which restricted the rate under low flow

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to a spray around the outside edge of the insert and a secondary stream in the centre when the tap was turned on full. The flow rate in litres per minute was recorded before and after fitting to allow calculations to be made on the water saving capability of the product. The details of the type and size of product installed were recorded.

Tap Re-washering

A tap re-washering service was offered to repair leaking taps. This was undertaken by a qualified plumber. The service involved refitting washers and repairing the washer seat (reseating) if required. Replacement of the tap glands for ceramic disc style taps and washer style glands was an addition introduced during feedback during Phase 2. The service was restricted to taps where the work could be completed without causing damage to the basin. Customers could also have dripping outside taps repaired.

Aerated Showerhead

The aerated showerhead, supplied by AL Challis Limited was the Aquiv8 412 model, designed to inject air into the flow. This gives the feeling of a similar or more powerful flow, but uses less water. The showerhead reduced the flow rate to 8litres/min. There was a minimum pressure requirement of 1 bar and a maximum pressure of 12 bar. The showerheads were not suitable for electric showers or if the flow was already below 8 litres/min. Aerated showerheads were fitted by a qualified plumber who checked the suitability of the shower. The existing showerhead was removed and given to the customer. The flow rate in litres per minute was recorded before and after fitting to allow calculations to be made on the water saving capability of the product.

Bath Measure

The bath measure did not require a plumber to fit the product and it was delivered with other products and services that the customer had ordered. The product was a visual indicator that attached to the inside of the bath. Its main purpose was as an educational tool to show how much water the customer could save. By seeing the amount of water used in each bath this would encourage customers to reduce the level of the bath and therefore the amount of water used in each bath. The measure was marked with lines at 2.5cm intervals. By reducing the level by 1 interval 15 litres of water could be saved.

Shower Timer

The shower timer was given to customers at the time of their audit and was designed as a visual reminder to the customer to reduce the amount of time spent in the shower. The timer was digital and in the shape of a yellow duck.

Shower Flow Bag

The shower flow bag was provided as a tool to allow the customer to calculate the flow rate of their shower. The bag had instructions printed on it and was sent out with the original mailing so that customers could gauge the suitability of their shower for the aerated showerhead.

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2.5 Prize Draw

To encourage customer's interest in the project, a prize draw in conjunction with Red Letter Days gave one customer the chance to win a £200 voucher to participate in a Red Letter Day 'experience' (Appendix C). In order to be entered in to the draw, the customer was required to actively participate in all aspects/stages of the project and within reason have all suggested products fitted. The prize draw gave added incentive to the customer to take part and to complete and return the satisfaction survey back to ESW. The winner of the prize draw was selected at random.

2.6 Sustainability

Changes were made to the materials used to produce the H_2eco workbook, the customer satisfaction survey and pack handed to the customer at the end of their audit. Various factors have been taken into consideration and changes have been implemented to reduce the environmental impact of Water Efficiency projects. Recycled paper and card were used and vegetable based inks in the printing process. The tape measure included in the 'Home Survey Pack' was made from paper and included instructions to recycle the tape measure if it was no longer wanted. The pen was manufactured from recycled CD cases. The bag used for the Children's Pack was changed in Phase 2 from a plastic bag to a paper one.

Another area that was examined was the manner in which applications arrived at Mouchel's offices. In previous projects these were posted back to ESW to be logged as received and then posted to Mouchel's offices. To streamline this process and speed up the receipt of the workbook by Mouchel a PO Box and Business Reply Service were set up. The prepaid envelope in the 'Home Survey Pack' was printed with a PO Box address for Mouchel to enable workbooks to be returned directly to Mouchel.

2.7 Publicity

Awareness of Phase 3 of H_2eco would have been increased in the study area from the previous publicity of Phases 1 and 2.

DRAFT

2.8 Customer Contact

All correspondence and telephone contact with the customers in the study was handled completely by Mouchel's project administration staff.

The initial function of the project hotline was to receive calls from customers requesting the 'Home Survey Pack'. Once the completed workbook was returned by the customer to Mouchel, the information provided was recorded and quality checked into the project database.

Although the majority of workbooks were completed by the customer and posted to Mouchel (252), there was the option for customers to complete the questions over the phone with the assistance of one of the administration staff if they wished. One customer who applied close to the closing date chose to do this.

The hotline was staffed between 08:30 and 18:00 Monday to Friday. Some shifts continued until 20:00 to catch customers that returned from work at later times. Despite these additional shifts there were still 18 customers that could not be contacted.

The database used for the H_2eco Phase 3 study was a result of many improvements and developments from previous water efficiency projects. The structure of the database was based on previous ESW project databases with improvements aligned to new literature sent out to the customer.

The database served three main purposes:

1. Recording customer contact.
2. Provision of project management information.
3. Reporting.
4. Generating the Water Savers Report

Through the course of the project, additions and improvements were continually made, one of the most significant being the automation of the production and emailing of the Plumbers audit sheets, meaning that the work for the following day could be generated and emailed to the field staff in a fraction of the time previously taken to complete this task. A comprehensive description and explanations of the functionality of the database can be seen in Section 2.12.

Once the data from the workbook had been entered and quality checked the customer could then be sent their 'Water Savers Report'. A covering letter was produced for each customer and a customer specific report. These were either posted or emailed

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depending on whether the customer had selected letter or email for their method of contact. The letter accompanying the report informed the customer that they would be contacted to arrange for the plumber to visit them and complete their audit at a time that was convenient for them.

To reduce the likelihood of cancellations customers were offered the choice of a morning or afternoon appointment time. Under the ESW Customer Charter the customer could also request a two hour window for their appointment (27 customers). Morning appointments were between 08:00 - 13:00 and afternoons were between 13:00 – 17:00. The majority of audits were completed between Monday and Friday within these times, there were a few occasions where an evening appointment was requested (11 customers). On occasions more specific times were requested than the two hours and although these specific times were not guaranteed, plumbers did attempt to accommodate these requests where possible. Under ESW's Customer Charter, if a plumber arrived for an AM appointment after 13:00hrs or a PM appointment after 17:00hrs or after the two hour window it was recorded as a plumber missed appointment. This meant that ESW were obliged to send a cheque for £30 to the customer for the inconvenience, this cost was then passed on to Mouchel. There was one occurrence of this (Section 3.1.1).

Despite the flexibility of appointments there were still five occurrences where the customer either missed their appointment or cancelled their order on the doorstep.

2.8.1 Additional Customer Contact

Initial interest from customers was lower than the target of 1000 applications requested by ESW. By 11th February 2009 there had only been 109 requests for Home Survey Packs. At this point it was decided that a Reminder Letter (Appendix D), encouraging customers to take part and informing customers of the project deadlines should be sent. The Reminder Letter was sent to 2,383 customers on 13th February 2009.

By 16th February 2009, Mouchel reported to ESW that requests for packs were still below the original figure expected (115). At this point the decision was made to employ two additional members of staff to contact customers to ask if they would be interested in receiving the survey pack. The two additional staff worked between 16:00 and 20:00 between Monday – Friday.

2.9 Collection of Customer Information

All of the data contained in the workbooks was recorded into the database by the project administrative staff. Checks for consistency and input errors were made as the workbooks were checked for a second time by another member of the administrative staff or the project manager. In addition to the quality review, possible errors were

DRAFT

reduced further as the data entry screen replicated exactly the order of questions and look of the workbook to make data entry as intuitive as possible.

Table 5 presents the questions that were included in the workbook.

Table 3: Details of Audit Questions

Question in Audit Workbook		Possible Response	Use of Information
Q1.	How many people in each age group live in your home?	Under 16 yrs 16 - 60 yrs Over 60 yrs	Used to investigate the effects on water consumption from educating children about water wise activities and including them in efforts to conserve water. To determine how many children's packs may be suitable for their home. Used to determine ages of adults in the household and potential water usage
Q2.	How many kitchen/utility sinks do you have? Of these sinks, how many have: separate hot and cold taps? combined hot and cold taps?	Open question Open question Open question	Used to determine the suitability of the product suggested (Miracle Tap Adaptor) Used to determine the suitability of the product suggested (Miracle Tap Adaptor) Used to determine the suitability of the product suggested (Miracle Tap Adaptor)
Q3.	How many wash basins do you have? Of these wash basins, how many have separate hot and cold taps? combined hot and cold taps?	Open question Open question	Used to determine the suitability of the products Suggested (Tap Inserts) Used to determine the suitability of the products suggested (Tap Inserts) Used to determine the suitability of the

DRAFT

Question in Audit Workbook		Possible Response	Use of Information
		Open question	products suggested (Tap Inserts)
Q4.	Do you have any dripping taps in the kitchen and elsewhere in the house	Yes/No	Used to determine how many dripping taps need repairing (Dripping Taps)
Q5.	If yes, how many dripping taps do you have?	Open question	Used to determine how many dripping taps need repairing (Dripping Taps)
Q6.	If you have dripping tap(s) please measure the flow rate by following the instructions below:	Open question	Used to determine how many dripping taps need repairing (Dripping Taps)
Q7.	Will you have your dripping tap(s) repaired?	Yes/No	Used to determine the suitability of the products suggested (Dripping Taps)
Q8.	How many toilets are there in your home?	Open question	The toilet flush products were limited to one item per toilet. Also used in calculating consumption
Q9.	Using the diagrams below please fill in the following information for each toilet in your house:	Toilet Type and Cistern Measurements	Used to determine the suitability of the products suggested (ecoBETA and Save-a-flush)
Q10.	Does anyone in your home leave the tap running whilst cleaning their teeth?	Yes/No	Used to estimate water usage
Q11.	How many showers do you have in your home?	Open question	Used to determine the suitability of the products suggested (showerhead)
Q12.	Please measure the flow rate of each shower and confirm the type of shower.	Open question	Used to determine the suitability of the products suggested (showerhead)
Q13.	Please indicate the amount of time each member of the household spends showering and the number of showers per week.	Open question	Used to estimate water usage on Water Savers Report (showerhead)

DRAFT

Question in Audit Workbook		Possible Response	Use of Information
Q14	Does your property have one or more baths?	Yes/No	Used to determine the suitability of the products suggested (Bath Measure)
Q15	If yes, how many times is the bath used in one week?	Open question	Used to estimate water usage on Water Savers Report (Bath Measure)
Q16	How many times is the bath water reused in a week (e.g. Children	Open question	Used to estimate water usage on Water Savers Report (Bath Measure)
Q17	Using the tape measure provided please measure the depth you fill the bath to (before getting in).	Open question	Used to estimate water usage on Water Savers Report (Bath Measure)
Q18.	Do you own a dishwasher?	Yes/No	Used to estimate water usage.
Q19.	If yes, how many times do you use the dishwasher per week?	Open question	Used to estimate water usage.
Q20.	Do you use the economy/half load setting on your dishwasher?	Yes/No	Used to estimate water usage.
Q21.	How old is your dishwasher?	Open question	Used to gather data for Phase 4.
Q22.	Are you planning to replace your dishwasher in the next year?	Yes/No	Used to gather data for Phase 4.
Q23.	Do you own a washing machine?	Yes/No	Used to estimate water usage.
Q24.	If yes, how many times do you use the washing machine per week?	Open question	Used to estimate water usage.
Q25.	Do you use the economy/half load setting?	Yes/No	Used to estimate water usage.
Q26.	How old is your washing machine?	Open question	Used to gather data for Phase 4.
Q27.	Are you planning to replace your washing machine in the next year?	Yes/No	Used to gather data for Phase 4.
Q28.	Do you have a garden?	Yes/No	Used to determine the suitability of the

DRAFT

Question in Audit Workbook		Possible Response	Use of Information
			products suggested (water butt)
Q29.	If yes, what method do you use to water your garden?	Open question	Used to determine the suitability of the products suggested (water butt)
Q30.	Do you have any hanging baskets and/or pots plants?	Yes/No	Used to determine the suitability of the products suggested (water saving crystals)
Q31.	Do you use a hose to wash your car?	Yes/No	Used to determine the suitability of the products suggested (hose gun)

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2.10 Delivery Techniques

Once an appointment had been booked for a customer, the database generated an audit sheet specific to that customer (Appendix G). The audit sheet contained information on the products that had been suggested for that property divided into the areas of the home in which they would be fitted. Included on the sheet were customer details, (name, address, phone number, etc) specific information relating to the appointment time and the customer (if required). If a property was metered, details of the meter serial number, the previous reading collected by ESW and the location of the meter were included on the sheet. A reading was taken at the time of the audit and recorded by the plumber.

From previous water efficiency projects, email has shown to be the most efficient means of distributing work to the plumber and this was retained for H_2eco Phase 3 study. Appointments that were booked into the database could be viewed within a table format. This table contained the specific details of the time requests from the customer and allowed project staff to redistribute work between the plumbers to enable them to accommodate as many customers' requests as possible. Once this process had been completed the audit sheets could then be sent to the plumber. These were emailed to each plumber the night before the arranged appointment slot, or in the case of work scheduled for a Monday they were sent on the Friday afternoon. The audit sheets were attached in a PDF format so that they could not be altered.

To enable the customer to receive a copy of their audit sheet two copies of the sheet were printed. When the information was completed on the sheet, carbon paper was

inserted between the two sheets so that the top copy could be presented to the customer and the copy faxed or emailed back to Mouchel.

To keep mileage and driving time to a minimum each plumber checked the locations of their appointments and put them in to a logical order in which to attend them. This was relative to the allocated AM and PM time slots.

When the plumber arrived at the customer's home they explained an overview of the audit to give the customer a better understanding of the motivation behind it. They also ensured that all details on the audit sheets were correct and made corrections if required. At each property the plumber was expected to record:

- Details of which products had been installed or the service provided.
- If the product installed or service provided has changed from the original request and details of why.
- Any comments on fitting issues.
- The length of time it took to install each product and the total time spent at the property.
- Before and after flow measurements from taps and showers.
- Any comments from the customer.
- A signature from the customer to confirm that had received everything they had ordered or agreeing the reason as to why a product could not be installed.
- A meter reading, at metered properties.

DRAFT

At the end of the day the completed audit sheets were returned to Mouchel by the Plumber. The completed sheets were received by a computer based fax machine which stored each page as an image. This enabled the audit sheets to be easily filed and backed up on Mouchel's server.

The following morning, checks were made to ensure that all of the audit sheets had been received. The data was then input into the database checking the data as part of the process. A second check of the data input was completed for quality control.

2.11 Collecting Meter Reading Data

For Phase 3 an audit meter reading was collected at the time of the audit. This was to be used in conjunction with routine six monthly billing meter readings collected by ESW billing staff. This data was provided to ESW.

Due to the short duration of the project the audit meter reading was the only reading collected. There wasn't time available to collect the usual 22 days in advance of audit, 22 days after audit meter reading and logger data. Logger data was not collected as a minimum of 22 days was required in advance of the audit for a viable data set to be obtained. Because of this, collection of a pre-audit meter reading was not required. A final meter reading (22 days after the audit) was not collected as there would have been no 'pre-audit' logger or meter reading data to compare it to.

2.12 Database

The bespoke project database developed by Mouchel for Phase 1 of H_2eco utilised Microsoft Access 2003 to store and process all of the data collected throughout the duration of the Phase 1 project. The structure of this database was developed for Phase 2 and then further developed to be utilised for Phase 3. Its main functions were to

- record customers applications and progression
- track customer calls
- produce the Water Savers Report
- record appointment times and dates
- collate lists of customers requiring telephone calls to book appointments
- generate audit sheets to enable plumbing staff to accurately collect the data required
- automate conversion of audit sheets to PDF documents and attaching to emails
- record letters sent to the customer
- monitor plumber availability
- produce invoice, stock and progress reports
- storage of audit data and generation of calculated savings

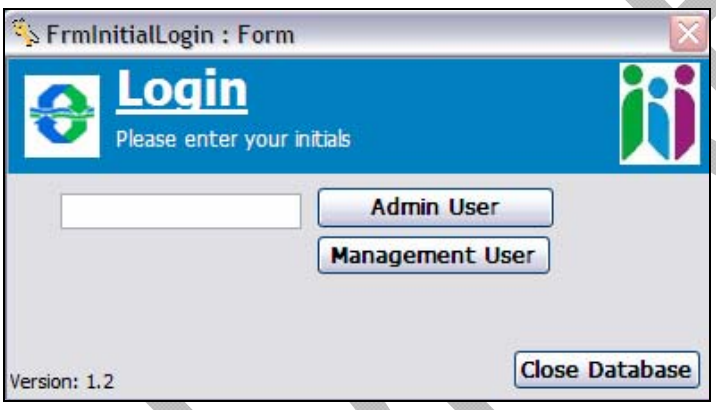
DRAFT

ESW provided Mouchel with the 2,492 customer's names and addresses within the study area which were used to populate the database. Once a customer's application had been received into the customer contact centre, the details of their application were entered into the database and progressed through the relevant stages.

2.12.1 User Login

To make the database auditable and record users additions, amendments or deletions all management and administrative staff were required to log into the database using their initials (Figure 3). By each member of staff logging into the database a record could be kept of who had performed each task. Access to the management section of the database was restricted by a password and allowed completion of tasks such as changing plumber availability, running weekly/stock/invoice reports, tracking user's progress and automation of job sheets. With the two sections of the database separated, access to the different areas could be regulated accordingly.

Figure 3: Initial Log In Screen



As each customer's application progressed through the stages of the project, dates were allocated to each of the stages. For example: Once a customer's workbook had been entered on to the database and the checked for errors, a 'pack inputted' date was assigned to the property reference number. The stages, (Figure 4), enabled contact centre staff to track the progress of each application.

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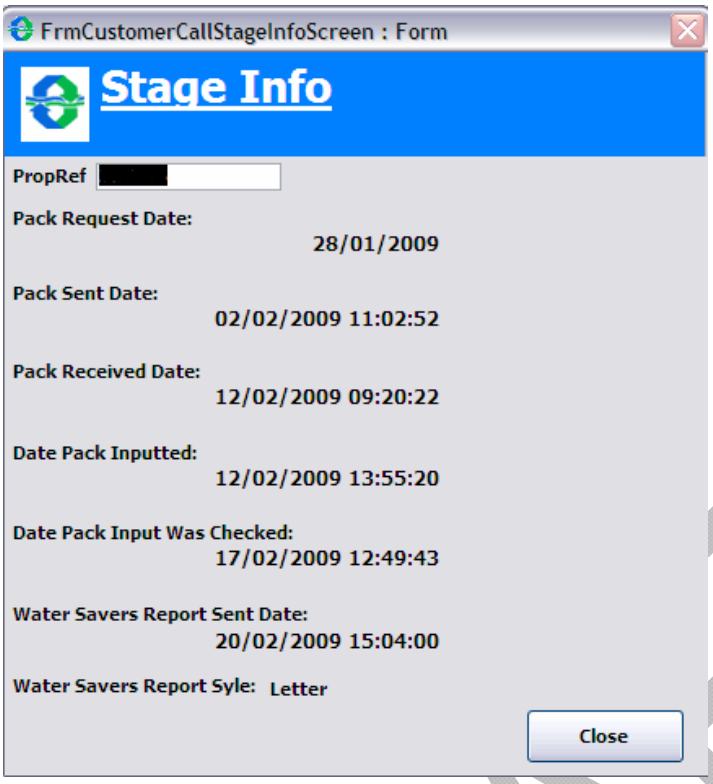
Figure 4: Customer Stages



2.12.2 Customer Search/Liaison

Within this screen an overview of all of the customers and what stage the customer had achieved could be viewed. All records of any contact with the customer could also be logged on this screen. The customer details provided by ESW were available to customer contact centre staff using the Customer Liaison Screen of the database. The screen allowed users to search for a customer or group of customers by property reference number, name, address, current project stage and postcode. Figure 5 shows the Customer Liaisons screen.

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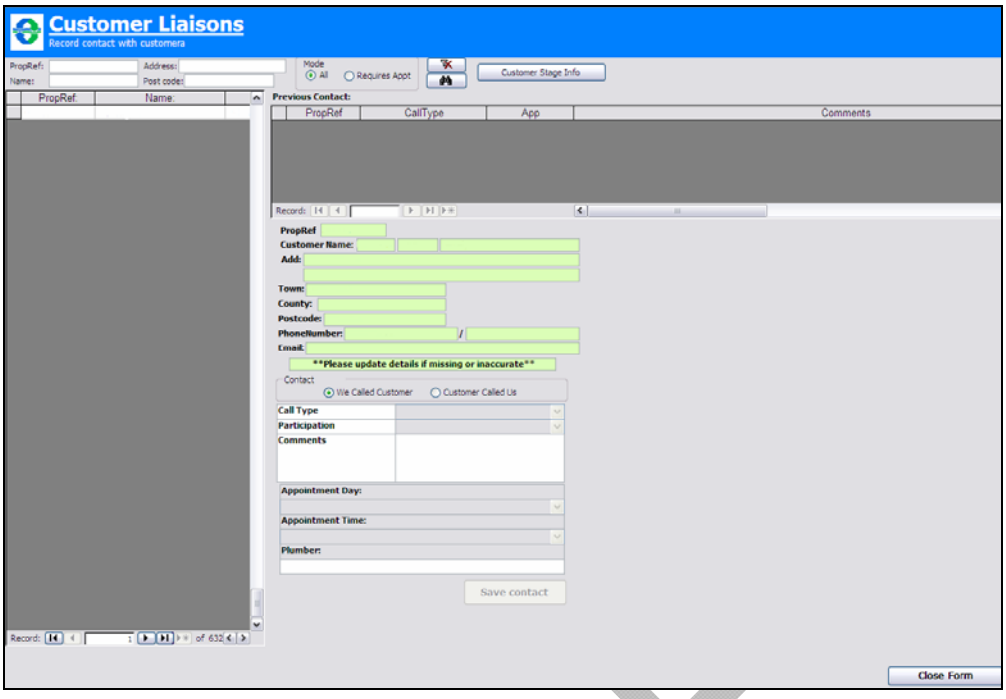
Figure 5: Customer Liaisons



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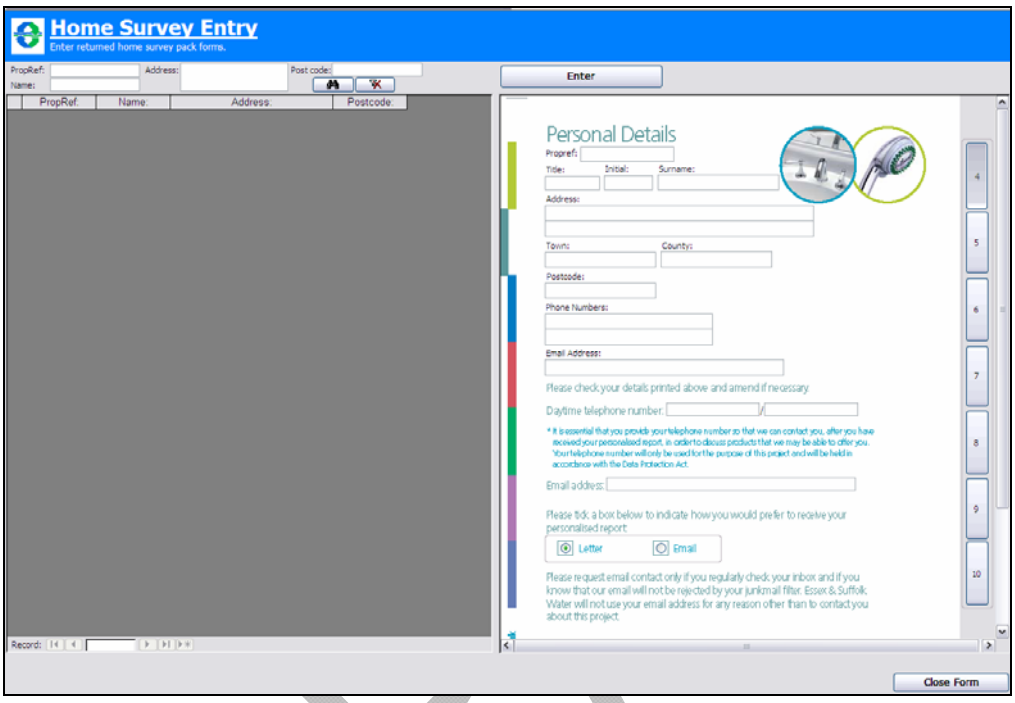
2.12.3 Customer Workbook Received/Entry

Figure 6, the Workbook entry screen held all of the data contained in the workbook. The pages mirrored the pages in the workbook to make data entry as intuitive as possible. Those inputting data could tab between fields to speed up the data entry. Pages were numbered at the side of the screen to correspond with the pages of the Workbook.

Figure 6: Workbook Entry Screen



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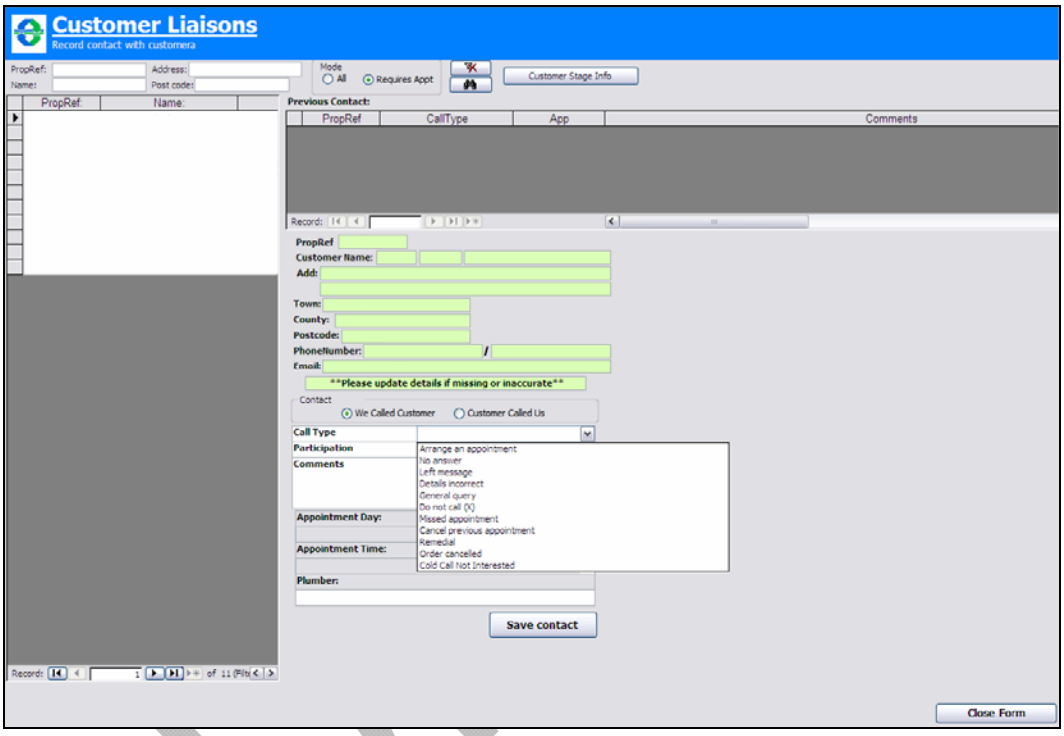
2.12.4 Customer Contacts

Once a customer had been called (or had phoned in) the project staff were able to log the appropriate type of call and make notes as required. For calls where the customer required an appointment, project staff were then presented with a list of dates (and AM and PM slots) selected depending on their previous meter reading date. These dates were automatically generated by the database depending on the availability of plumbers and appointments already booked. Any additional appointment details could also be entered at the time of booking the appointment.

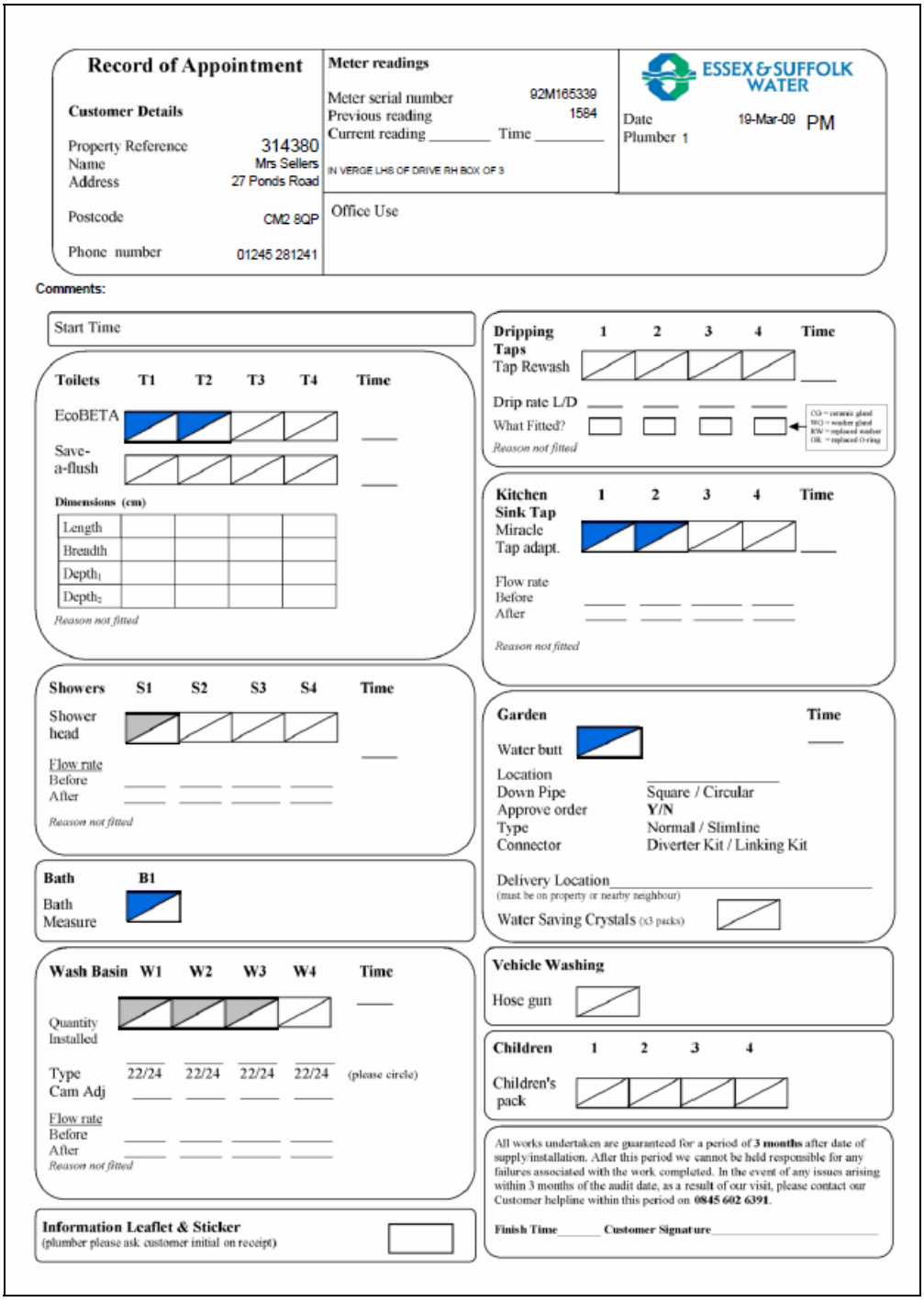
Figure 7: Appointment Booking



2.12.5 Audit Entry

The products suggested for the customer, were emailed to the plumber in an automatically generated audit sheet. Figure 8 shows the format of the Audit Sheet showing an example of products which may be suggested. The highlighted sections denote products that the Plumber may be able to install.

Figure 8: Plumber Audit Sheet



Plumbers faxed back the completed audit sheets at the end of each day to a Mouchel computer based fax machine. Faxes received were converted to an image and saved to the server. Data from the audit sheets were then entered into the audit entry section of the database (see Figure 8). The form was designed to replicate the job sheet sent to the plumber, for ease of inputting, also designed to minimise any errors.

2.13 Project Management

Through a varied experience gained from previous water efficiency projects Mouchel and ESW have developed on the very effective processes for project management in the third Phase of H_2eco. From the initial planning stages of the project Mouchel worked in partnership with ESW to establish Progress Meetings, Weekly Reporting and Service Level Agreements to closely monitor the progress of the project. Mouchel's style of project management has developed through experience gained from a long and successful history of water efficiency projects with many clients in the water industry.

At the close of Phase 2 a feedback session was held with the majority of project staff attending. The information and learning points highlighted at this meeting were taken forward into the planning for Phase 3. An initial 'start-up' meeting was held in advance of any customer contact. The Phase 3 pilot study ran over a very short time scale. The weekly report that had developed into a useful tool for monitoring the progress of the project took the place of progress meetings. The small number of meetings also meant that due to a large reduction in mileage accumulated by driving between offices, a contribution towards reducing the projects carbon footprint was made.

The Weekly Report (Appendix H) played a major role in observing the progress of applications, customer contact, audits and stock. Through the weekly report Mouchel were able to provide ESW with accurate updates on stock, both products ordered and products fitted. ESW were able to assess quantities of stock required each week for the plumbers to complete their audits.

Each week, number of stock ordered, stock fitted and stock remaining was recorded, enabling efficient management of stock for the project. Just one plumber was responsible for recording stock and distributing stock to other plumbers following collection from the ESW stores at Dukes Park. Plumbers were also required to complete weekly stock takes of their vehicles and submit to Mouchel.

Also covered in the weekly report was the unique Service Level Agreement between Mouchel and ESW. This assessed many daily activities within the project and covered days between:

- Receipt of the customers' application and confirmation to the customer of receipt.

DRAFT

- Quality control of applications and contact with customers to book an appointment.

- Receipt of the plumbers' audit sheet and its' recording on to the project database.

By keeping the above to five working days, it was ensured that customer focus on the project would be maintained to minimise numbers withdrawing from the project.

The bespoke database created for the project also played a major part in the successful project management of H_2eco Phase 3 pilot study. On a daily basis the database was used to:

- Produce plumber audit sheets and distribute work to the plumbers on site.

- Store customer specific data relating to each property.

- Record all contact with customers.

- Produce monthly invoice reports.

- Provide data used in the weekly reports.

- Record plumbing staff availability and allocate appointments accordingly.

- Perform checks on completeness of data within the database to minimise errors.

DRAFT

2.14 Staff Training

In this current Phase of H_2eco, two plumbing staff were employed by Mouchel to complete the 'site' element of the work. Both had completed plumbing work at customer's homes in the previous phases of H_2eco and so were relatively familiar with the focus and objectives of the project. They were qualified to NVQ level 2, plumbing tradesmen and trained and registered under the National Water Hygiene Card Scheme or held existing Blue Cards issued by ESW.

Before the project commenced all project staff attended a training day delivered by ESW and Mouchel. The training included ESW's corporate messages and their expectations of customer service. Also covered was guidance on collection of the data and information on why the data was required. Examples of how it should be recorded were provided, giving the plumber a better understanding of what they were collecting and the reasons behind it.

Project related aspects of Health and Safety were covered and task specific Risk Assessments were created and presented at the training day. Both plumbers were given a detailed 'project briefing' booklet containing background information on the project, guidance for completion of the audit sheets, details on each of the products and task specific Risk Assessments.

Each of the products were discussed and advice and tips on installation and potential issues that may arise were covered. The training ensured that plumbing staff understood the objectives of the project and the data that they were recording and helped to provide background knowledge to answer any general questions that the householder might have regarding the products and their water use.

Some of this information was drawn from a feedback session held by ESW and Mouchel with the field staff and plumbers from Phase 2 which provided useful information and suggestions for improvements for the Phase 3 Pilot Study. In addition to this project staff were available throughout the audits to answer any additional queries that may have arisen.

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3 Results

3.1 Number of Customers Contacted and Audits Completed

In total, 630 water efficiency packs were sent to customers inviting them to take part in the third Phase of H_2eco. This resulted in,

- 252 completed applications retuned to Mouchel.
- 194 (76.7% of applications received) properties completing an audit.

By 13th February, 90 applications (workbooks) had been received. From similar experiences in Phase 2, customers appear to need prompting to take part and to return the workbook once they have received it. Through a combination of the Reminder Letter and from additional telephone calls to customers the total number of applications rose to 252.

The following section provides the results from the additional calls.

Over eight days, from additional calls to customers,

- 434 requests for packs were added to the total from telephone calls to customers.
- 1,724 telephone calls were made.
- 125 packs were returned and resulted in 88 audits.

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Table 4 shows in detail the results from the additional customer telephone calls.

Table 4: Additional Call Results

Date		Calls Made	Requested Pack	Not Interested	Left Message	No Answer	No Number or Not Recognised	Packs Returned	Packs Returned and Had an Audit
Week 1	16/02/09	107	38	35	13	4	55	15	11
	17/02/09	252	56	63	18	24	147	16	10
	18/02/09	247	64	97	26	94	30	22	15
	19/02/09	233	70	104	3	92	34	18	12
	20/02/09	212	57	97	1	82	32	18	13
Week 2	23/02/09	273	68	110	14	118	29	18	15
	24/02/09	189	39	60	46	64	19	9	8
	25/02/09	211	42	46	68	74	22	9	4
Totals		**1724**	**434**	**612**	**189**	**552**	**368**	**125**	**88**

The original estimate for the number of completed workbooks returned from the packs sent was 500. The actual figure for this was nearer half at 252. Additional telephone calls were made to encourage customers to return the completed workbooks and in total 504 telephone calls were made.

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3.1.1 Cancelled Orders

There were 40 (15.89% of applications received) customers that cancelled their order, the most common reasons for this were:

- It wasn't convenient for a plumber to visit due to a family reason.
- The kitchen and or bathroom were being replaced.
- The customer could not make any of the available appointment slots.

The remaining 12 (4.7% of applications received) customers could not be contacted or declined to arrange an appointment.

Table 5 shows a summary of customer contact for the whole study.

Table 5: Summary of Customer Contact

Contact Type	Total Number	As a Percentage of Total Study Area (2492 Customers)
Total Applications Received	252 (total) (Post) (Over Phone)	10.11% 99% 1%
Reminder Letters Sent	2,383	96 %
Appointment Confirmation Letters Sent	87	3.49 % (44% of appointments booked)
Total Phone Calls Made	4383 (total) 2158 (to send out pack) 504 (to ask customers to return their pack)	 86.6% 20.2%
Audits Completed	194	7.78 %

Of the 194 customers that received a Water Savers Report and had an audit completed, all were given the choice of receiving the report either by letter or by email. 151 customers chose to receive the report by letter and 43 customers received the report by email.

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Table 6 shows a summary of the distribution of applications, appointments and audits over the duration of the Phase 3 study including averages per day.

Table 6: Distribution of Applications Received, Appointments Booked and Audits Completed

Number		Feb 2009	Mar 2009	Total
Applications received	Avg. per day*	4.65	7.23	**6**
	Metered	77	12	**205**
	Unmetered	16	31	**47**
	Total	**93**	**159**	**252**
Appointments booked	Avg. per day	0	9	**4.71**
	Metered	0	164	**164**
	Unmetered	0	34	**34**
	Total	**0**	**198**	**198**
Audits completed	Avg. per day**	0	8.82	**8.82**
	Metered	0	161	**161**
	Unmetered	0	33	**33**
	Total	0	194	**194**

** Average per day refers to each project working day*
*** Average appointments completed by all plumbers*

By 13th February, 90 applications (workbooks) had been received. From similar experiences in Phase 2, customers appear to need prompting to take part and to return the workbook once they have received it. At this point the Reminder Letter was sent to renew interest in the project (Appendix D). This could possibly be put down to factors such as busy work/family life causing people to forget but could also be due to the customer not placing enough importance on saving water.

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Figure 9 shows a comparison of applications received and the distribution of appointments booked over the period of field work. As the appointments were available between 2nd – 27th March there was only a three week time period where appointments were available.

Figure 9: Customers Initial Response to Invitation and Appointment Scheduling

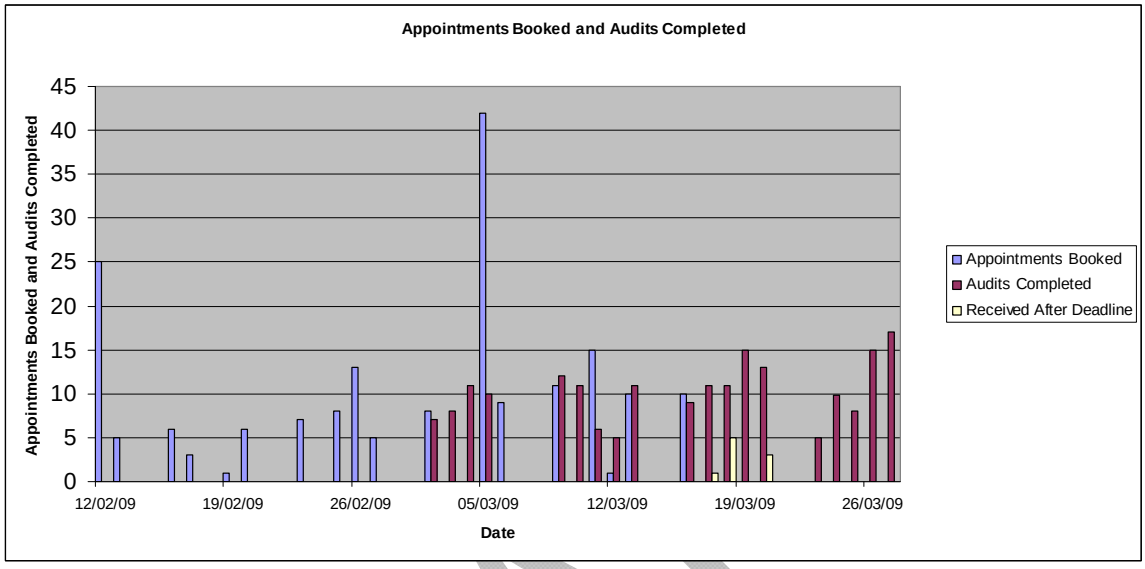

Table 7 shows the time period between the customer phoning to arrange an appointment and the appointment date. The most common was between 4 and 7 days in advance of the appointment.

Table 7: Time from Customer Contact to Appointment

Time in Advance	% of Appointments
0 days	0.52
1 day	12.89
2 days	10.82
3 days	7.73
4 days	16.49
5 days	17.53
6 days	15.46
7days	11.34
Up to 1 week	92.78
More than 1 week	7.22

3.1.2 Missed Appointments

During the day of the customers' appointment they were given two opportunities to be at home for the appointment within the allocated time slot. All customers were offer an AM (08:00 – 13:00) or PM (13:00 – 17:00) appointment slot. Customers could also request

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a two hour appointment slot under ESW Customer Charter. If no one was at the property at the first visit the plumber or technician noted the time that he had called on a pre-printed compliments slip which asked the customer to call the customer contact centre to arrange another appointment. If upon return at a later time there was still no one present at the property the time of the second visit and the details of their appointment were noted down and the compliments slip left at the property.

There was one occasion where the plumber missed an appointment made with the customer. Under ESW Customer Charter the customer received £30 compensation and a re-arranged appointment was made. The reason for this missed appointment was due to a two hour appointment slot being missed from the appointment details. To avoid this reoccurring the issue was discussed with the project administrative staff and instructions on ensuring this information was captured were reinforced.

3.2 Patterns in Which Customers Participated

Table 8 shows a summary of customer responses to the questions in the Workbook

Table 8: Summary of Customer Responses

Category of Question and Demographics	Response	Number Responded	Proportion of Respondents (252)%
Occupancy	1	59	23.3
	2	129	51.0
	3	26	10.3
	4	25	9.9
	5	8	3.2
	6	1	0.4
Households with Children under 16 years	0	209	82.6
	1	19	7.5
	2	19	7.5
	3	4	1.6
	4	2	0.8
Households with Members 16 – 60 years	0	131	51.8
	1	41	16.2
	2	64	25.2
	3	12	4.7
	4	5	2.0
Households with Members Over 60 years	0	98	38.7
	1	72	28.5
	2	82	32.4
	3	1	0.4
Number of Toilets	0	103	40.7

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Category of Question and Demographics	Response	Number Responded	Proportion of Respondents (252)%
	1	92	36.4
	2	49	19.4
	3	7	2.8
	4	2	0.8
	Number per property	0.6	
	Number of toilets suitable for Retro-Fit product	150	59.3
Number of Showers	0	224	88.5
	1	25	9.9
	2	3	1.2
	3	1	0.4
	4	0	0.0
	Number suitable for aerated showerhead	29	11.5
Baths	Have Bath – Yes	103	41.0
	-No	150	59
Dripping Taps (number per property)	0***	239	94
	1	11	4
	2	2	1
	3	1	0
	4	0	0
	5	0	0
	6	0	0
	7	0	0
	8	0	0
Garden	Has Garden – Yes	235	93
	- No	12	5

***Answered no.

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3.2.1 New Data Gathered on Dishwashers and Washing Machines

Customers were asked to provide information on their use of dishwashers and washing machines to add additional data to each households water use (See Table 5).

As another addition to the information on water use habits customers were also asked about leaving taps running whilst cleaning teeth. Of 128 customers who answered no, they did not leave the tap running, 110 were metered and 18 were not. 38 people answered yes that they did leave the tap running, although there was a suggestion that some of these were children. The split between metered and non-metered was 27 metered and 11 not metered, showing that those on a meter were much more likely to switch the tap off.

Dishwashers and washing machines are two major uses of water within the home. Dishwashers can use between 10 – 14 litres per cycle (Waterwise 2007) which, although traditionally perceived as using large amounts of water could be less than a washing up bowl (approximately 10 litres per bowl) .

Of the 194 customers who took part, 107 owned a dishwasher and 87 did not. The split between metered and unmetered within this group was relatively even. 85 households were metered and 22 were not. For the 87 that did not have a meter, 76 were metered and 11 were not.

There didn't appear to be a direct correlation between frequency of use and household size in the very high usage. The two households that recorded a usage of 10 times per week consisted of two and three people and the two households that recorded a usage of 9 times per week only had two people in each.

However, in the lower usage, there was some evidence of the average number of occupants decreasing alongside times used per week.

Table 9 shows a summary of customer's dishwasher usage.

Table 9: Dishwasher Usage

Times Used per Week	No. of Households	Average No. of Occupants
0	10*	2.3
1	14	1.86
2	11	1.64
3	14	2.71
4	21	2.33
5	10	2.6
6	6	2.83
7	14	3
8	3	4
9	2	2
10	2	2.5

*(not used or less than once per week)

There were 87 households that did not own a dishwasher.

When asked about the economy setting on their dishwasher there was approximately a 50% split between, yes I use (57) and no I don't or do not have (50).

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Lastly the age of the unit and plans for replacement were covered. There were three people that said they would be replacing their dishwasher in the next 12 months.

Table 10 shows a summary of dishwasher age.

Table 10: Dishwasher Age

Age	No. of Households
< 1 yr	7
1-2 yrs	17
2-3 yrs	12
3-4 yrs	9
4-5 yrs	10
5-6 yrs	11
6-7 yrs	6
7-8 yrs	4
8-9 yrs	8
9-10 yrs	4
> 10 yrs	19
> 20 yrs	3

Dishwasher age was spread over a number of years but the most common were between 1-3 years and 4-6 years (Table 10).

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Customers were also asked to provide information on their washing machines. Table 11 shows a summary of customer's use of their washing machines over a seven day period.

Table 11: Washing Machine Usage

Times Used per Week	No. of Households
0	2
1	15
2	43
3	42
4	24
5	14
6	14
7	10
8	9
9	1
10	7
>10	5

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The most common usage pattern for washing machines was between two (43) and three (42) times per week.

The highest use was 21 times per week. Of the 12 households using their washing machine greater than 10 times per week, 7 of them had 1 or more children under the age of 16.

Of the 85 households who used their washing machines between 2 – 3 times per week only two had children under 16.

When questioned on economy settings, 130 households said that they did use the setting and 56 either did not have one or they did not use it. 36 of the washing machines were older than 10 years which may mean that they were not manufactured with an economy setting.

Table 12 shows a summary of washing machine age. The most common ages for washing machines was evenly spread between 1-2, 2-3, 3-4 and 4-5 years old.

Table 12: Washing Machine Age

Age	No. of Households
< 1 yr	6
1-2 yrs	22
2-3 yrs	22
3-4 yrs	26
4-5 yrs	23
5-6 yrs	16
6-7 yrs	19
7-8 yrs	9
8-9 yrs	5
9-10 yrs	2
10-11 yrs	16
> 11 yrs	17
> 20 yrs	2
> 35 yrs	1

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3.3 Number of Products Supplied and Fitted

In this section results are shown on products, their installation rates and their suitability when analysing cost and savings achieved.

169 properties received plumbing items, 142 were metered and 27 were not. 25 properties received non-plumbing items, 19 were metered and 6 were not.

Table 13 shows the numbers of products suggested against numbers of products fitted. Also included in this table are numbers of participating properties.

Table 13: Quantities of Products Suggested/Fitted

Area	Product	Total Number of Properties that had a Product Suggested	Number of Products Suggested (total)	Total Number of Properties Where Fitted	Number Supplied/ Fitted
Toilets	Save-a-Flush	24	25	76	111
	ecoBETA	134	194	41	51
Showers	Aerated Showerhead	29	34	30	34
	Shower Timer (given at audit)	194	194	194	194
	Shower Flow Bag (sent with introductory letter)	631	631	631	631
Bath	Bath Measure	103	103	73	73
Taps	Miracle Tap Adaptor	174	205	90	97
	Tap Inserts	250	449	50	71
	Tap Re-washering	14	18	10	14
Garden	Crystals	183	183	59	59
	Water Butt (Standard)	233	233	104	104
	Water Butt (Mini)			60	60
Vehicle Washing	Hose Gun	68	68	87	87
Children	Detective Kit	44	77	31	61

NB Greyed cells denote only 1 item per property

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3.3.1 Patterns in Products Fitted

Table 14 shows the quantity of products that were installed per property.

Table 14: Quantities of Products Fitted

Total Number of Products Installed	Number of Customers	Percentage of Total Audits (%)
0	4	2
1	7	4
2	30	15
3	44	23
4	29	15
5	29	15
6	22	11
7	14	7
8	10	5
9	1	1
10	2	1
11	1	1
12	1	1

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Table 14 shows that customers had a quantity of 3 products installed (23% of audits). 2 to 5 products were the next most common quantity all showing 15% of audits.

The number of products suggested may not necessarily equate to the number of products fitted. Although products were suggested that should have been suitable for installation, there were still cases where products could not be fitted. If an alternative was available the plumber would offer it to the customer. At the time of the audit, customers had the option to change their selection of products (where suitable) so additional products not originally suggested could be offered

Table 15 shows the number of customers and how many products they received.

Table 15: Quantity of Different Types of Product Installed

Number of Different Products Installed	Number of Customers	Percentage of Total Audits (%)
0	4	2.06
1	8	4.12
2	35	18.04
3	51	26.29
4	40	20.62
5	30	15.46
6	16	8.25
7	7	3.61
8	2	1.03
9	1	0.52

The most common quantity of different types of products fitted was 3. There were 51 properties that received 3 types of product and this was 26.29% of the total audits.

Table 16 shows the percentage of customers that were able to successfully have a product installed and the cost to purchase that item. The standard size water butt, save-a-flush bag and Miracle Tap adaptor had the highest success rate of installation.

Table 16: Product Costs Against Quantities Fitted

Product	% Participants that Received the Product	Unit Purchase Cost to ESW
Water Butt	84.54%	See below for costs of both types of water butt
Standard	53.61%	£28.75 + £3.35 delivery
Mini	30.93%	£23.50 + £3.35 delivery
Save-a-flush	57.22%	£0.64
Miracle Tap Adaptor	50.00%	£4.47
Hose Gun	44.85%	£0.49
Bath Measure	37.63%	£2.67
TapMagic	36.60%	£2.75
Children's Detective Pack	31.44%	£5.96
Crystals	30.41%	£0.14
ecoBETA	26.29%	£9.75
Shower Head	17.53%	£17.95
Tap Re-washering	7.22%	-

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3.4 Patterns in Suitability of Products

Products were suggested for the customer's property from the information provided in their workbook. The customer was informed of the suggested products via the Water Savers Report. Table 17 shows a summary of the common reasons for a product being unsuitable. In many cases this was due to incorrect information from the customer.

Table 17: Success Rate for the Installation of Products

Product or Service	Installation Success Rate (%)	Most Common Reason for Not Fitting
Tap Re-washering	56	No leak apparent
Tap Inserts	20	Spouts not circular
ecoBETA	30	The ball valve arm caught on the ecoBETA
Miracle Tap Adaptor	58	Spout did not have a thread
Showerhead	68	Was a pumped shower system
Bath Measure	95	Customer declined
Save-a-flush	67	Customer declined or chose ecoBETA instead
Water Butt	89	No downpipe available
Crystals	31	Customer declined

3.5 Products Not Fitted

The TapMagic tap insert showed the lowest success rate of installation. This was most commonly because the tap outlet was not round or did not have a thread. In most cases of unthreaded taps the spout was too small to accommodate a cam adjuster to allow the insert to be fitted.

In toilets where an ecoBETA was not suitable a Save-a-flush bag was offered instead. The most common reason for the ecoBETA not being fitted was a lack of space between the ball valve arm and cistern wall. In these cases the ecoBETA could not be fitted as there was a danger of the arm catching on the ecoBETA and the water overflowing the cistern.

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3.6 Customer Satisfaction

Once the audit had been completed, an information pack about water efficiency was left with the customer. The pack contained useful information for customers and a satisfaction survey (Appendix K) to complete and return back to ESW. The pack contents included information on:

- Water saving products
- Saving water through showering
- Recycling
- Advice on purchasing water efficient products
- Water saving products for the bathroom
- Water saving advice for the garden
- Essential contact details for ESW departments

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The return of the satisfaction survey was the main condition for the customer's entry into the Red Letter Day prize draw. In total there were 75 surveys returned.

Table 18 shows a summary of the responses to the Customer Satisfaction Survey.

Table 18: Responses from Customer Satisfaction Survey

Question on Satisfaction survey	Percentage that answered yes to the following questions (%)
Did the introductory letter clearly explain what the project was about?	98.7
Were you clear about how the project would operate?	100.0
Did the information book provide you with sufficient information about the products on offer?	94.7
Did you manage to complete the workbook without any problems?	97.3
Were you happy with the telephone service?	98.7
Was the person who made the appointment helpful and courteous?	98.7
Are you happy with the products you have received?	96.0
If applicable, are you happy with the quality of the plumbing service?	98.0
Was the plumber or field technician helpful and courteous?	100.0
Are you happy with the overall level of service you received	98.7

As part of the Satisfaction Survey customers were asked what they found most useful about the project. A selection of the responses is shown here.

- Saving water for everyone's benefit, savings money for us especially as pensioners. Thank you very good service!
- Reading the paper left behind was very enlightening.
- Learning how simple changes i.e. tap and shower head can make useful reduction in water use.
- Being shown how to calculate usage. Kid's packs great help to explain project easily to children. Water butt will make a big difference for us.
- To think about everyday use of water.
- That you have actually tried to reduce water consumption. Thank you.

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4 Water Savings

4.1 Calculated Savings from Each Product Supplied

The calculated savings use property specific data from measurements collected from the audit as well as product specific details from manufacturers and other assumptions. The approach is based on the industry standard and widely accepted "measurement by proxy" technique.

The calculated water saving was determined for each product that was installed at each property. The total saving per property is derived from the sum of the water savings for all products installed. Table 19 shows the water savings achieved and the savings from plumbing and non plumbing devices.

Table 19: Water Savings

Non Plumbing Devices Only*(l/prop/day)	Plumbing Devices (l/prop/day)	All Properties (l/prop/day)	Study Area Properties (Ml/day)
6.42	30.98	33.08	0.00642

* Not including Children's Detective Kit, nor Shower Flow Bag savings as these are undetermined

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4.1.1 Plumbing Products

Plumbing products were installed in 161 properties. Calculated savings have shown that this will result in a saving of 0.00498 Ml/d within the study area, an average of 30.98 l/prop/day.

Within plumbing products the greatest water savings were achieved by the ecoBETA (39.5 l/prop/day) and the aerated showerhead (29.6 l/prop/day).

4.1.2 Non Plumbing Products

There were 21 customers that received only non-plumbing products. Calculated savings have shown that installing non plumbing products was able to save approximately 0.00013 Ml/d within the study area, this equates to an average saving of 6.42 l/prop/day.

Within non-plumbing products the greatest water savings were achieved by the bath measure (5 l/prop/day) and the shower timer (2.5 l/prop/day).

While a detailed description of the assumptions is provided in Appendix J, a summary of the procedure is provided below.

ecoBETA

Internal dimensions of the toilet cistern were collected, also collected was the full water depth and depth when using the reduced flush. These measurements were used to calculate the volume of water in the cistern and how much would be released on a 'full flush' and a 'half flush'. The average of the toilet volume in each household was then multiplied by the occupancy (given by the customer) and an average of 5 flushes per person per day, of these 2 will be a full flush and 3 a half flush. (Source – ESW micro component studies).

Aerated Showerhead

Where a showerhead was fitted, flow rates were taken before and after the installation, enabling the reduction in flow rate to be calculated. This was then multiplied by the number of showers per week (where given by the customer) and the average duration of a shower (as determined by previous ESW water efficiency studies).

Tap Re-washering

It was assumed that tap re-washering was performed on dripping taps. On average a dripping tap loses 13.08 litres per day, the calculated saving from a tap re-washering is 8.39 litres per day (as determined by previous ESW water efficiency studies).

Tap Inserts

Where tap aerators were installed, flow rates were taken before and after the installation. It was assumed that usually a tap is not turned on fully so half the full flow rate was used to calculate the savings in litres per minute. This was then multiplied by the average use of the tap (from the Code for Sustainable Homes Technical Guide, March 2007) per day (5.4 minutes) to give a calculated saving as a result of installing the product.

Water butt

The calculated water saving following the installation of a water butt was based on findings from previous water efficiency projects and industry agreed standards. It was assumed that a water butt is able to save 45 litres per week for 16 weeks of the year when it is being used (as determined by previous ESW water efficiency studies).

Hose Gun

The calculated water saving from a hose gun has been calculated on the assumption that each household uses the hose for 40 minutes, 33 times per year and that the flow rate from the hose is 500 litres per hour and that the hose gun is able to save 5% of this (as determined by previous ESW water efficiency studies).

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Water Crystals

The assumptions used to calculate the calculated water savings as a result of using water crystals were taken from previous ESW water efficiency studies. Water crystals are able to save 20% of 2 litres per day for 16 weeks per year (as determined by previous ESW water efficiency studies).

Miracle Tap Adaptor

Where Miracle Tap Adaptors were installed, flow rates were taken before and after the installation. It was assumed that the when using the tap it is not turned on to full capacity so half the full flow rate was used to calculate the savings in litres per minute. This was then multiplied by the average use of the tap (from the Code for Sustainable Homes Technical Guide, March 2007) per day (5.4 minutes) to give a calculated saving as a result of installing the product.

Children's Detective Kit

The detective kit was a tool to increase awareness of water consumption to children. Whilst some customers may use this information and change their water use, the kit itself was not considered to provide a significant water saving.

Bath Measure

The calculated water savings for the bath measure assume that 41.9% (calculated from actual data from the Water Saving Toolkits Audit) customers that received a bath measure reduced their bath volume by 2.5 cm resulting in a 15.34 litre saving per bath. This was then multiplied by the number of baths taken per week (where given by customer). (as determined by previous ESW water efficiency studies).

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5 Reporting

5.1 Weekly Reports and Meetings

From Phases 1 and 2 Mouchel maintained a weekly schedule of reports on the progress of the project to ESW. The format of the weekly report (Appendix H) was developed in consultation with ESW. The report was considered a useful management tool. From the feedback session held at the end of H_2eco Phase 2 it was agreed between Mouchel and ESW that the format worked well and should not be altered. Regular reports covering applications, stock and Service Level Agreements enabled ESW and Mouchel to effectively manage changes to the project, stock and ensure excellent communication.

Along with the weekly report that was emailed to ESW each week additional project resources were also sent. An updated version of the database was sent to ESW to allow them to analyse the updated data.

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7 Evaluation of the Programme

When the average costs per property are combined with the details of calculated volumes saved (provided in Section 4.1) a cost per volume saved can be calculated for cost benefit analysis.

7.1 Cost/Benefits of Individual Audit Products

A cost benefit analysis has been undertaken of the 13 products and services offered to ESW customers through H_2eco Phase 3. The cost of the product and the cost of installation have been used for the products requiring a plumber. The calculations used to populate Table 26 are based on the mean averages of calculated water savings and use assumptions summarised in Section 4.1 and provided in detail in Appendix J.

Table 26: Cost/Benefit of Products

H_2eco Items	Cost of Item	Cost of Installation/ Delivery	Water Saved L/property/day	Cost per m^3 Saved
ecoBETA**	9.75	18.15	39.52	£0.39
Aerated Shower Head**	17.95	21.18	29.59	£0.72
Save-a-Flush**	0.64	10.59	12.03	£0.51
Tapmagic Tap Insert**	2.75	24.20	16.42	£0.90
Kitchen Tap Adaptor**	4.47	24.20	10.34	£1.52
Bath Measure*	2.67	1.00	5.03	£2.00
Water Butt (standard)**	28.75	3.35	1.97	£8.93
Water Butt (mini)**	23.50	3.35	1.04	£14.15
Hose Gun*	0.49	1.00	1.51	£2.70
Crystals*	0.14	1.00	0.054	£57.84
Tap Re-washering**	-	32.07	5.60	-
Children Detective Kit*	5.96	2.00	undetermined	-

*1 year lifespan. **5 year lifespan

Table 26 provides details of the cost per m^3 of water saved for each of the plumbing products. The savings have been calculated based on a product lifespan of 5 years. The lifespan for the non-plumbing products has been set to 1 year for all except the Save-a-flush and water butt that have an assumed lifespan of 5 years. Although the cost benefit is not as favourable for the non-plumbing products there are still strong reasons for using these products. Each one offers an educational benefit to the customer. They encourage the customer to think about the water they use and make a behavioural change.

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The costs to install the ecoBETA were relatively high but the cost per m^3 saved in comparison with the Save-a-flush is considerably lower. The aerated showerhead has also shown to give a good level of water savings in relation to cost.

The cost/benefit analysis provides a useful tool for comparing products, however there are other factors that require consideration when selecting which products should be used in future.

7.2 Evaluation of Which Products should be Included in Future Projects

Table 27 shows a simplistic quantified comparison between each of the products, on a scale of 1 to 5 (5 being Excellent and 1 being Poor). No weighting has been placed on individual aspects i.e. 'cost of installation' is as important as 'customer take up'.

The additional factors used for the assessment were,

- 'Ease of delivering the item' was based on the time required by the plumber to fit the product as well as comments recorded by the plumber at the time of the audit.
- Where available, 'Cost/benefit' is a rank of the cost per m^3 saved given in Table 26.
- 'Installation Rate' was based on actual number of each product that the plumbers were able to fit.
- Potential sustainable saving took into account if the product aimed to influence the customer's behaviour (e.g. low sustainable saving) or if the product was installed e.g. plumber retro fit products.

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The details given in Table 27 indicate that when all aspects (ease of delivery, cost/benefit, customer take-up and sustainable savings) are considered, the ecoBETA and aerated showerhead are the most appropriate product for use in self audit style water efficiency projects.

Table 27: Assessment of Individual Products

H_2eco Items	Ease of Delivering Item	Cost/ Benefit	Installation Rate	Potential Sustainable Saving	Total Score
ecoBETA	3	5	4	5	17
Aerated Shower Head	3	5	2	5	15
Save-a-Flush	5	2	5	3	15
Kitchen Tap Insert	2	4	3	5	14
Water Butt (standard)	4	2	5	3	14
Tap Inserts	2	4	2	5	13
Water Butt (mini)	4	2	2	3	13
Bath Measure	5	3	3	2	13
Hose Gun	5	1	5	2	13
Crystals	5	1	5	1	12
Tap Re-washering	1	5	1	5	12
Shower Timer	4	2	5	1	12
Detective Kit	4	2	4	1	11

Italics denotes non plumbing products

The shower timer and the children's kit scored lowest but both have educational value which should be taken in to consideration.

7.3 Demonstration of Success of Programme Design Method

As shown in Section 4.1 the installation of products under the H_2eco Phase 3 pilot project was able to save 0.00642 Ml/day. The majority of this saving was as a result of the installation of plumbing products.

From the comments received via the customer feedback forms it can be seen that H_2eco Phase 3 pilot study has been as positively received as Phases 1 and 2. The responses from customers indicated that much had been done to raise awareness of water efficiency within the home and the customers considered the initiative to have been a great success for ESW. Many commented on the fact that they had not realised how much water they consume and generally suggested that they were pleased to have had the opportunity to take part.

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7.4 Recommendations

The main purpose of the third Phase of H_2eco study was to promote water efficiency and to identify areas of the methodology for development for the next full scale H_2eco project. The following points are a summary of the suggested developments.

7.4.1 Mail Out

The tape measures arrived individually coiled and wrapped in small plastic bags. The tape measures were required to be folded flat to avoid them being damaged in the envelope containing the pack contents. Additional time was required to remove the tape measures from the plastic bags and fold them flat.

The tape measures could be supplied without bags which would reduce preparation time of the packs. Removing the plastic also provided a more environmentally friendly approach.

7.4.2 The Home Survey Pack

On previous phases of H_2eco the pack was sent to every customer within the study area. This resulted in wasted materials as customers who were not interested in participating disposed of the pack.

For Phase 3 of the H_2eco study, a letter was sent to each customer within the study area. The letter invited them to request a pack if they would like to participate, instead of sending the pack to all customers. A financial saving from the use of fewer packs would be achieved and minimise the environmental impact of the project.

7.4.3 Workbook

For Question 9 customers were asked to provide 3 bits of information about their toilet cistern. Approximately 25% of respondents did not return all the information requested.

The layout of Question 9 should be reconsidered to make clearer that all 3 requests for information were required from just Question 9. This may include bolder instructions or redesigning the layout of the question in the workbook.

7.4.4 Closing Dates

Some customers commentated during a telephone call they were confused about the deadline for returning the workbook. This was because a deadline was provided for returning the workbook, printed on the workbook. There was also a deadline for returning the satisfaction survey, printed on the red letter day prize, terms and conditions flyer. These dates were different. This was the only possible reason for any confusion with dates.

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These dates could be clarified further in the literature. It should be noted these dates can't be selected as the same date to avoid confusion due to their order in the process of the project.

7.4.5 Red Letter Day Experience

A Red Letter Day experience was offered as a gift to participating customers in the Phase 3 pilot study. The draw did not seem to attract as much attention as originally hoped.

A possible alternative would be to change this to a more practical item such as vouchers for a supermarket?

7.5 Innovation

7.5.1 Online Applications

Some customers participating in Phase 3 asked why they were not able to apply using the internet. For small scale studies this would be impractical due to the cost of setting up. For larger studies this would need to be considered in more detail. It would need to consider the likely uptake of customers printing out the workbook to allow them to walk to appliances in their house and then complete the workbook and finally entering data back into their computer. Although initially a good idea the benefits and disadvantages would need to be carefully considered for a specific project.

7.5.2 PDA's

For future studies a PDA handheld computer could be used. This has been trialled once by Mouchel and would primarily be used to send work straight to the Plumber. The main purposes of the PDA would be to increase accuracy of collecting data, real time access and checking of data, improved monitoring of progress of field staff. The advantages and disadvantages of using PDA's are provided in Table 28.

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Table 28: Advantages and Disadvantages of PDA use.

Advantages	Disadvantages
Reduction in paper use.	Requires a basic level of computer literacy.
Improved Control/Management through real-time communication with Operatives (Job tracking, day to day progress, location etc.).	Speed can vary between areas, devices and users.
Increased data accuracy through enforced fields/workflows. Software can ensure operatives supply "Required" fields and ensure they work in a specified order.	If not maintained correctly, device battery life can be reduced.
Improved health and safety through use of location tracking and communication reports.	
Improved Data Security as no customer sensitive information is retained on device.	
Improved service to customer.	

7.5.3 Data Logging and Meter Readings

The installation of data loggers at metered properties and meter readings should be included in future studies. Meter readings pre-audit, audit and post-audit possibly with logger data enable actual savings to be calculated from the installation of water saving devices at a property. This would allow comparison of water usage at a property with no water efficient devices. Additionally comparisons can also be made of the effectiveness of devices against assumed savings although this should only be taken at a property level at this stage.

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8 Conclusions

The primary drivers of the H_2eco Phase 3 pilot study were the promotion of water efficiency and identification of improvements to the H_2eco methodology. The pilot study aimed to provide useful information and guidance for the fourth phase of H_2eco and future water efficiency studies. The study contributed to maintaining ESW's position as the leading water company in water efficiency.

For the H_2eco Phase 3 methodology, changes were made to the stages of the study to improve efficiencies of time and cost and also improve environmental sustainability. Improvements were made to the design of the workbook questionnaire sent to customers. To maximise the opportunity for water savings, the style of questions were altered to gather more information on the customer's water use within the home.

Greater flexibility was provided to the plumbers to install as many products as possible at the customer's home, dependant on the devices at the property. If alternative or additional products were suitable to devices at the property the products initially suggested could be altered.

A Business Reply Service was established for the study. This removed the need for completed workbooks to be sent from ESW's offices in Chelmsford to Mouchel. A significant reduction was made in the time taken for the customer's completed workbook to reach Mouchel for data entry.

A water saving of 33.08 l/prop/day was achieved from 194 properties. This achieved a saving of 0.00642 M/ld over the study area. A summary of the key water savings is provided in the table below.

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Table 29: Key Water Savings Data

Product	Quantity Fitted	Average Water Saving (L/prop/day)
ecoBETA	51	39.52
Aerated Shower Head	34	29.59
Save-a-Flush	111	12.03
Tap Insert	71	16.42
Miracle Tap Adaptor	97	10.34
Tap Re-washering	14	5.60
Bath Measure	73	5.03
Shower Timer	194	2.45
Water Butt (standard)	104	1.97
Water Butt (mini)	60	1.04
Hose Gun	87	1.51
Crystals	59	0.054
Savings		**33.08 l/prop/day****

* One bag sent with every pack ** Figure derived from an average of total saving per property per day from all participating properties.

Of the water saving products used in the study, the ecoBETA provided the greatest water saving. An average saving of 39.52 l/prop/day was achieved. The aerated shower head achieved the second highest average saving of 29.59 l/prop/day although this was fitted in a lower number of properties as it could not be fitted to power or pumped systems. It.

From the results of the Phase 3 pilot study a good level of savings was achieved from the current selection of products. The changes to the style of the questions included in the workbook questionnaire and plumbers taking time to discuss additional products not previously considered by the customer have provided good results in maximising opportunities for water savings.

Resource and cost savings were achieved between Phase 2 and Phase 3 by not sending the audit pack to all customers in the initial mailing. By considering this with reduced posting of workbooks between offices, this potentially has helped to reduce the carbon footprint of the H_2eco study. It is suggested that the improvements identified in the recommendations section should be carried forward to future phases of water efficiency projects.

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9 Appendices

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9.1 Appendix A: Introductory Letter

ESSEX & SUFFOLK WATER

Hall Street, Chelmsford, Essex CM2 0HH
www.eswater.co.uk

27 January 2009

H_2eco – Help the planet, help your wallet.

We are very pleased to offer you the opportunity to take part in our H_2eco Home Survey project to help you save water and save money. The key to water efficiency is reducing waste and unnecessary usage, rather than restricting your water use. By saving water, you can help the environment, and you can save money too.

At Essex & Suffolk Water we are committed to helping our customers save water. H_2eco is our latest water efficiency project which aims to help you make the most of your water. We are offering Home Survey packs which contain all the materials you require to undertake your own home water survey. The survey pack will show you where and how much water is being used in and around your home.

At no cost to you.

When you have undertaken your Home Survey and returned it to us we will use the information you have provided to produce a personalised Water Savers report, reviewing your water use and showing where water can be saved in your home. Based on your report, we may be able to offer you products that will help to save water in your home and garden. If the products require a plumber to install them, Essex & Suffolk Water will provide a qualified plumber free of charge.

In our last H_2eco project all customers received water efficiency products up to the value of £138 (based on RRP).

Call our hotline on 0845 602 6391 to request your Home Survey pack

If you would like to take up the offer of a H_2eco Home Survey pack or if you would like any further information, please call our hotline on 0845 602 6391. By accepting this offer you may have the chance to enter a free prize draw with a £200 Red Letter Day voucher to be won.

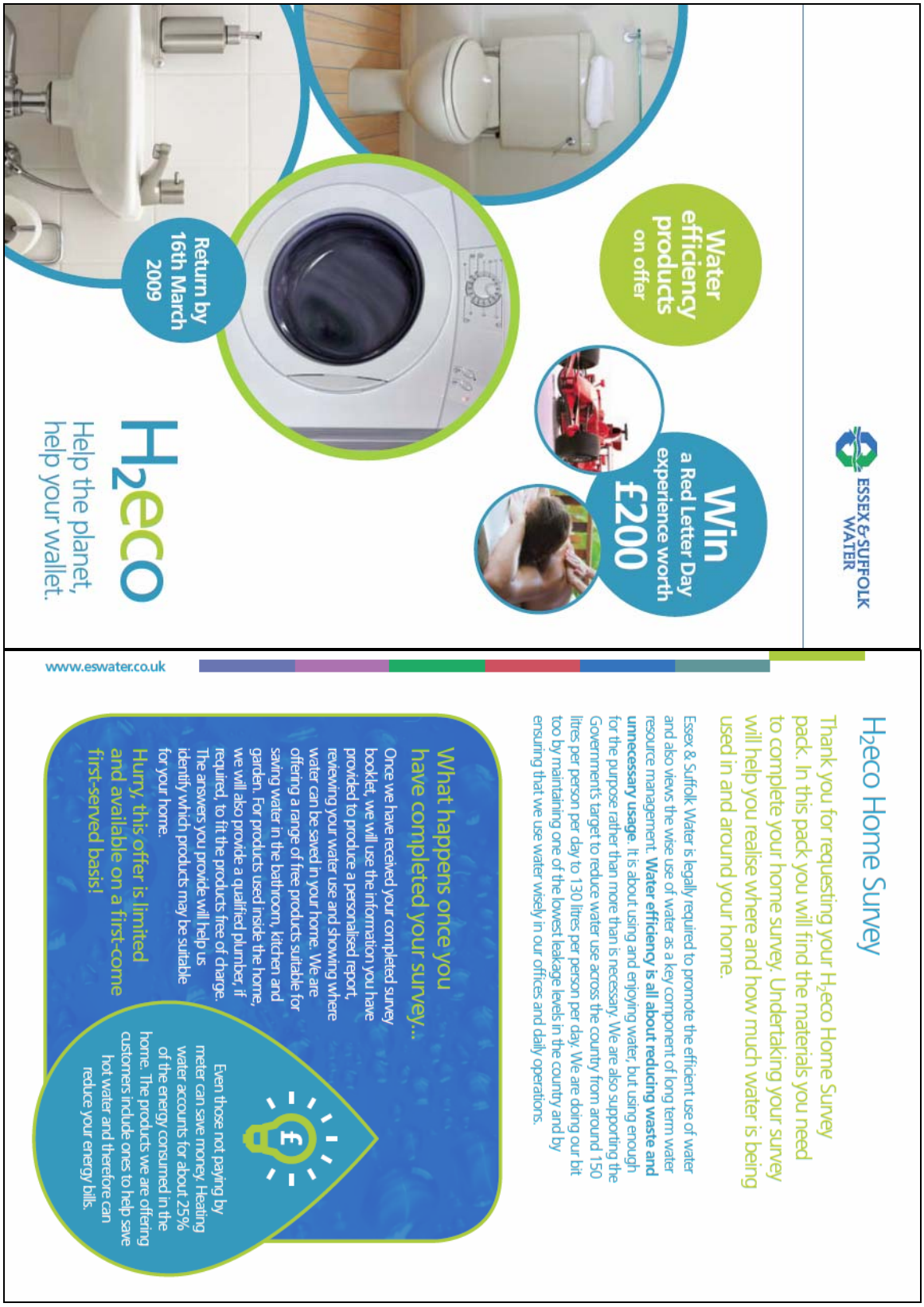
We look forward to hearing from you and working with you to save water.

Yours sincerely

Tom Andrewartha
Project Manager

Essex & Suffolk Water is a trading division
Of Northumbrian Water Limited.
Registered in England & Wales No.2366703
Registered Office: Northumbria House,
Abbey Road, Pity Me, Durham, DH1 5FJ

9.2 Appendix B: Workbook



Prize Draw

Have you ever wondered what it would be like racing around in a rally car or relaxing on a luxury spa day? We are offering the chance for one lucky participant to win a Red Letter Day Experience of their choice to the value of £200. See enclosed leaflet for more information and full terms and conditions.

* Entrance in the draw for the Red Letter Day experience is dependent upon completion and return of the survey booklet and full participation in any follow up water saving activity advised by Essex & Suffolk Water as part of this project.

In our last H_2eco project all customers received water efficiency products. Some lucky customers received products up to the value of £138*

*Based on RRP

One householder who took part in a similar project last year saved enough water to lead to a financial saving of about £60 per year*.

*Based on water and sewerage bill savings for a metered customer if the water saving is maintained for one year.

Completing your H_2eco Home Survey

It is now time to complete your home survey. We have provided you with a pen to complete the survey booklet as you take it around your home. **It is important that you answer all the questions in order to provide us with enough information to produce your personalised report.** Once complete, please return it by 16th March 2009 to Essex & Suffolk Water, PO Box 753, Haywards Heath, RH16 9HS in the pre-paid envelope provided. If you need any help to complete the survey please see the Q & A section at the back of this booklet or telephone **0845 602 6391**.

The confidentiality of any information provided is guaranteed through the Data Protection Act

Please check that you have the following materials in your pack:

- Shower flow bag
- Dripping tap gauge
- Pen
- Tape measure

Tea towel with compliments from Essex & Suffolk Water

If any materials are missing from your pack please ring **0845 602 6391** and we will send the missing materials to you.

H_2eco

Personal Details

Please check your details printed above and amend if necessary.

Daytime telephone number: _____

* It is essential that you provide your telephone number so that we can contact you, after you have received your personalised report, in order to discuss products that we may be able to offer you. Your telephone number will only be used for the purpose of this project and will be held in accordance with the Data Protection Act.

Email address: _____

Please tick a box below to indicate how you would prefer to receive your personalised report:

☐ Letter ☐ Email

Please request email contact only if you regularly check your inbox and if you know that our email will not be rejected by your junkmail filter. Essex & Suffolk Water will not use your email address for any reason other than to contact you about this project.

1. How many people in each age group live in your home?

☐ Under 16yrs ☐ 16-60yrs ☐ Over 60yrs

H_2eco

General

2. How many kitchen/utility sinks do you have? ☐

Of these sinks, how many have:

separate hot and cold taps? ☐☐

combined hot and cold taps? ☐☐

3. How many wash basins do you have? ☐

Of these wash basins, how many have:

separate hot and cold taps? ☐☐

combined hot and cold taps? ☐☐

4. Do you have any dripping taps in the kitchen and elsewhere in the house?

☐ Yes ☐ No (move to question 8)

5. If yes, how many dripping taps do you have? ☐

6. If you have dripping tap(s) please measure the flow rate by following the instructions below:

- Ensure your taps are turned off fully.
- Hold the dripping tap gauge under the tap for 20 seconds.
- Take the readings from the dripping tap flow gauge and write these below along with the length of time the tap has been dripping.

Dripping tap 1:	☐☐ litres per day	☐☐ weeks
Dripping tap 2:	☐☐ litres per day	☐☐ weeks
Dripping tap 3:	☐☐ litres per day	☐☐ weeks

7. Will you have your dripping tap(s) repaired?

☐ Yes ☐ No

5

Helpline 0845 602 6391

www.eswater.co.uk

Bathroom & Toilet

Over half of the water consumed in your household each day is used in the bathroom, so this is a good place to save water!

Toilets

8. How many toilets are there in your home? ☐

9. Using the diagrams below please fill in the following information for each toilet in your house:

- indicate what type of toilet you have by ticking the appropriate box.
- using the tape measure provided measure your toilet cistern(s) and enter the dimensions in the appropriate places (if you have a concealed or high-level cistern this information is not necessary).
- please circle where the handle/button flush is located on your cistern.

Our example

Toilet 1 - Location: *main bathroom*

☑ Single flush (pre Jan 2001*)
☐ Single flush (post Jan 2001*)
☐ Dual flush
☐ Concealed cistern
☐ High level cistern

* Under Water Regulations the maximum flush volume was restricted to 6 litres for toilets installed after 1 January 2001

Toilet 1 - Location: _____

☐ Single flush (pre Jan 2001*)
☐ Single flush (post Jan 2001*)
☐ Dual flush
☐ Concealed cistern
☐ High level cistern

Toilet 2 - Location: _____

____ cm

____ cm

☐ Single flush (pre Jan 2001*)
☐ Single flush (post Jan 2001*)
☐ Dual flush
☐ Concealed cistern
☐ High level cistern

Toilet 3 - Location: _____

____ cm

____ cm

☐ Single flush (pre Jan 2001*)
☐ Single flush (post Jan 2001*)
☐ Dual flush
☐ Concealed cistern
☐ High level cistern

Toilet 4 - Location: _____

____ cm

____ cm

☐ Single flush (pre Jan 2001*)
☐ Single flush (post Jan 2001*)
☐ Dual flush
☐ Concealed cistern
☐ High level cistern

* If you have more than 4 toilets please continue on a separate sheet of paper and enclose it with your survey booklet.

Taps

10. Does anyone in your home leave the tap running whilst cleaning their teeth?

☐ Yes ☐ No If yes, how many? ☐ people

7

Helpline 0845 602 6391

www.eswater.co.uk

Showers

11. How many showers do you have in your home? ☐

12. We have provided you with a flow-bag to help with the next stage. Please measure the flow rate of each shower (instructions can be found on the flow-bag) and indicate the type of shower (mixer, electric, power/pumped and hand-held/attached to bath taps).

Shower 1 ☐ litres/minute Shower type: _____

Shower 2 ☐ litres/minute Shower type: _____

Shower 3 ☐ litres/minute Shower type: _____

13. Please indicate the amount of time each member of the household spends showering and the number of showers per week.

Person 1	☐ minutes	☐ showers per week
Person 2	☐ minutes	☐ showers per week
Person 3	☐ minutes	☐ showers per week
Person 4	☐ minutes	☐ showers per week
Person 5	☐ minutes	☐ showers per week

* If there are more than 5 people living in your household, please continue on a separate sheet of paper and enclose it with your survey booklet.

Baths

14. Does your property have one or more baths? ☐ Yes ☐ No (go to question 18)

15. If yes, how many times is the bath used in one week?

☐ in total for all members of the family.

16. How many times is the bath water reused in a week (e.g. children sharing a bath)? ☐

17. Using the tape measure provided please measure the depth you fill the bath to (before getting in) and show this on the diagram below:

____ cm

H_2eco

Kitchen

Water use in your kitchen can account for a large proportion of your household water consumption, especially if you have a washing machine and/or dishwasher that is used regularly.

18. Do you own a dishwasher? ☐ Yes ☐ No (please go to question 23)
19. If yes, how many times do you use the dishwasher per week? ☐
20. Do you use the economy/half load setting on your dishwasher? ☐ Yes ☐ No
21. How old is your dishwasher? ☐ years
22. Are you planning to replace your dishwasher in the next year? ☐ Yes ☐ No
23. Do you own a washing machine? ☐ Yes ☐ No (go to question 28)
24. If yes, how many times do you use the washing machine per week? ☐ times
25. Do you use the economy/half load setting? ☐ Yes ☐ No
26. How old is your washing machine? ☐ years
27. Are you planning to replace your washing machine in the next year? ☐ Yes ☐ No

Helpline 0845 602 6391
www.eswater.co.uk

Outdoors

28. Do you have a garden? ☐ Yes ☐ No (please go to question 30)
29. If yes, what method do you use to water your garden (tick all that apply)?
☐ Hose ☐ Sprinkler ☐ Watering can
☐ Water butt ☐ Other: _____
30. Do you have hanging baskets and/or pot plants? ☐ Yes ☐ No
31. Do you use a hose to wash your car?
☐ Yes ☐ No ☐ Do not have a car

Thank you for completing your home survey

Please return this survey booklet to Essex & Suffolk Water, PO Box 753, Haywards Heath, RH16 9HS using the pre-paid envelope provided by **16th March 2009**. We will use the information you have provided to produce your personalised report which will be sent to you shortly.

H_2eco

Questions and Answers

Is there any cost involved?
No. Any water saving products or services we may offer you will be free. If a plumber is required to fit any products inside your home, Essex & Suffolk Water will also provide the plumbing free of charge. It is part of our legal duty to promote water efficiency and raise the awareness of using water wisely. The project also emphasises our commitment to provide free water efficient products to as many of our customers as possible.

What happens once I have returned my completed home survey?
Once we have received your survey booklet we will use the information you have provided to produce your personalised report showing where water can be saved in your home. The answers you have provided will help us identify which products may be suitable for your home. Once you have received your personalised report you will be telephoned to arrange a mutually convenient appointment for a qualified plumber or a field technician to deliver and fit (where necessary) water saving products. Visits to properties will take place between February and March 2009.

Why do I need to provide my telephone number?
It is essential that you provide your telephone number. Once you have received your personalised report via mail or email you will be telephoned to arrange a mutually convenient time and date for a qualified plumber or a field technician to visit you to deliver and/or fit your water saving products. Your telephone number will only be used for the purpose of this project and will be held in accordance with the Data Protection Act.

What is a Red Letter Day and how does the free draw process work?
More information about Red Letter Days can be found in the enclosed leaflet or by visiting www.redletterdays.co.uk. To be entered into the prize draw, you need to participate in all aspects of the project. Firstly, you need to complete your home survey and return it in the pre-paid envelope. Following this, you will be required to actively participate in the second phase by implementing our recommendations – this may involve using products we supply or allowing us to fit certain products. You will be entered into the prize draw for a £200 voucher towards a Red Letter Day of your choice once you have completed and returned the satisfaction survey. This will be provided to you during the appointment for delivery or fitting of water saving products. Please see enclosed leaflet for full terms and conditions.

Is there a limited number of customers who can take part in this project?
Yes. We have mailed around 2500 customers asking them to complete an H_2eco survey, but we have limited numbers of products to offer. Complete your survey and return it to us as soon as possible to avoid disappointment, and by 16th March 2009 at the latest.

If you have any further questions or need any help in undertaking the H2eco Home Survey please contact us on 0845 602 6391.

ESSEX & SUFFOLK WATER

Essex & Suffolk Water
Hall Street, Chelmsford
Essex CM2 0HH

January 2009

www.eswater.co.uk

This workbook is printed on recycled paper using vegetable based inks.

9.3 Appendix C: Audit Pack Contents

WIN A £200 RED LETTER DAYS GIFT VOUCHER

Essex & Suffolk Water together with Red Letter Days, the company famed for its amazing range of imaginative, indulgent and adventurous experiences, wants to give you the tranquillity of a relaxing day at a spa, the thrill of driving a classic car, the butterflies of flying a light aircraft, the gourmet delight of wine tasting or a lunch cruise on the Thames.

For hundreds of ideas, go to ***www.redletterdays.co.uk***

ESSEX & SUFFOLK WATER

H_2eco

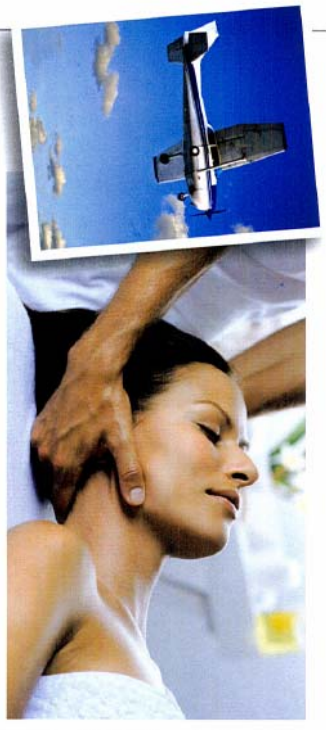
red letter DAYS

ESSEX & SUFFOLK WATER

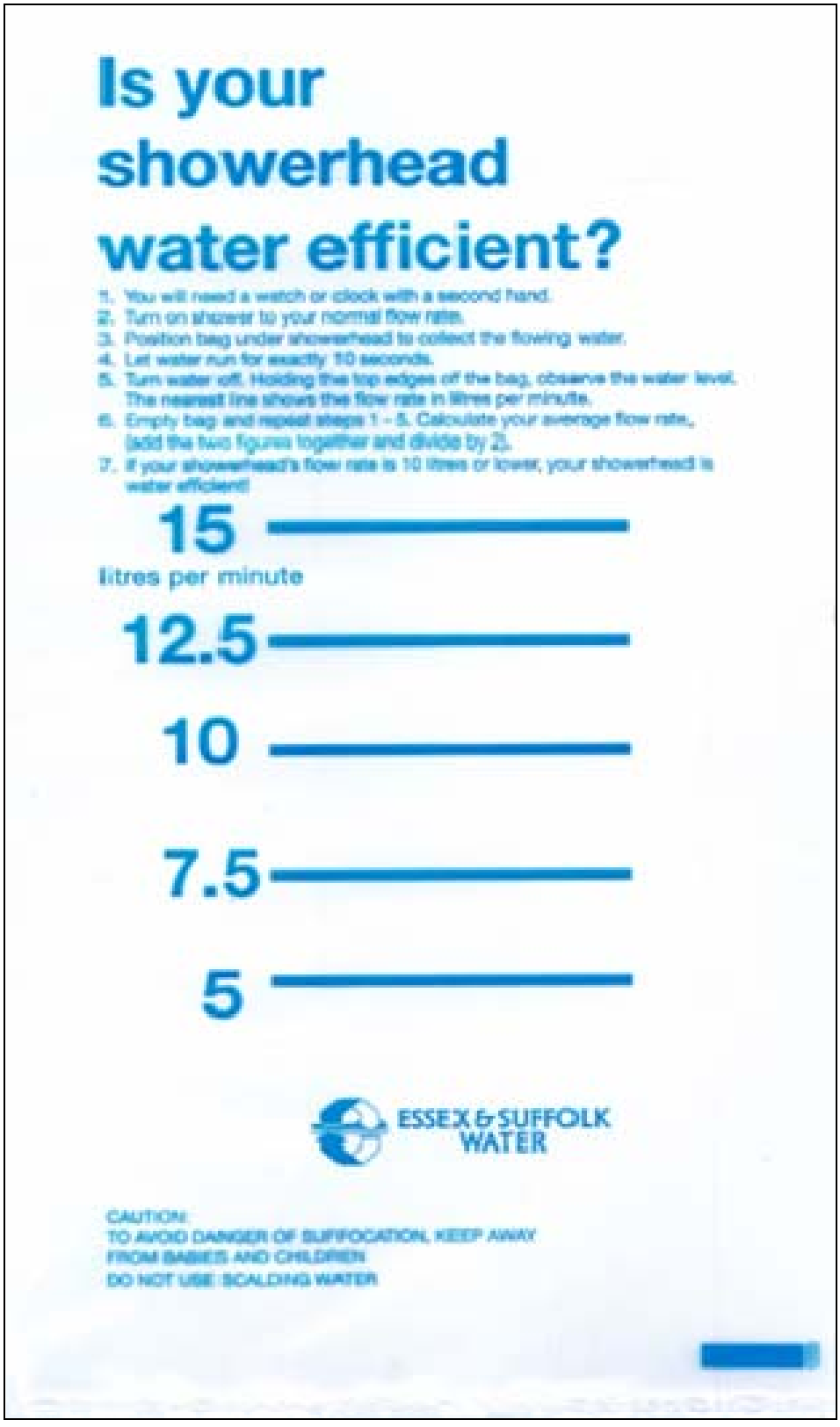
H_2eco

Terms and Conditions

1. The winner of the free prize draw will receive a voucher worth £200 to be spent on a Red Letter Days experience of their choice (Red Letter Days terms and conditions apply). The voucher must be used within 10 months of issue.
2. The free prize draw is only open to Essex & Suffolk Water customers who have been invited to take part in the H_2eco project (2009), fully participated in any follow-up water saving activity as advised by Essex & Suffolk Water as part of this project, and who have returned their completed satisfaction survey.
3. The draw is not open to Essex & Suffolk Water and Mouchel employees or their families, or anyone involved in the management of the project.
4. All entrants must be 18 years old or over.
5. Only one entry per household is permitted.
6. No cash alternative can be substituted for the prize.
7. The closing date for the return of your satisfaction survey (which constitutes your entry into the free prize draw) is 24 April 2009.
8. The draw will take place on 29 April 2009. The winner will be notified by telephone on 1 May 2009.
9. The name and town of the winner will be announced on our website www.eswater.co.uk in the first week of May 2009.
10. The winner may be required to participate in media activity relating to the competition.
11. No responsibility can be accepted for entries that have been lost in transit.
12. In the event of unforeseen circumstances, Essex & Suffolk Water reserves the right to substitute alternative prizes of equivalent or greater value.
13. The prize does not cover any supplementary costs associated with the Red Letter Days experience.



If you have any queries about entry conditions for the free prize draw please telephone 0845 602 6391.



Is your showerhead water efficient?

1. You will need a watch or clock with a second hand.
2. Turn on shower to your normal flow rate.
3. Position bag under showerhead to collect the flowing water.
4. Let water run for exactly 10 seconds.
5. Turn water off. Holding the top edges of the bag, observe the water level. The nearest line shows the flow rate in litres per minute.
6. Empty bag and repeat steps 1 - 5. Calculate your average flow rate, add the two figures together and divide by 2.
7. If your showerhead's flow rate is 10 litres or lower, your showerhead is water efficient!

15

litres per minute

12.5

10

7.5

5

ESSEX & SUFFOLK WATER

CAUTION:
TO AVOID DANGER OF SUFFOCATION, KEEP AWAY FROM BABIES AND CHILDREN
DO NOT USE SCALDING WATER

Hold drip gauge directly under the
dripping tap for 20 seconds. Quickly
remove and note the water level.
This indicates water lost.

H2eco

ESSEX & SUFFOLK
WATER
This pen is made from recycled CD cases

DRAFT

CHALLENGE
YOURSELF TO...
TURN OFF THE TAP WHEN BRUSHING YOUR TEETH.
SPEND ONE LESS MINUTE IN THE SHOWER.
ONLY USE THE WASHING MACHINE WHEN IT IS FULL.
RECYCLE RAINWATER IN YOUR GARDEN.
LET'S WORK TOGETHER TO USE LESS WATER.
www.eswater.co.uk
ESSEX & SUFFOLK WATER

9.4 Appendix D: Reminder Letter

ESSEX & SUFFOLK WATER
Hall Street, Chelmsford, Essex CM2 0HH
www.eswater.co.uk

12 February 2009

H_2eco – Don't miss your chance to save water and save money!

This is a reminder about our H_2eco Home Survey project which offers you the opportunity to save water and save money. We have already had a good deal of interest in this project and would like to make sure that you do not miss the opportunity to take part.

You may recall from our initial letter that we are offering Home Survey packs which contain all the materials you require to undertake your own home water survey. Once you have completed and returned the survey pack we will produce your personalised Water Savers report, reviewing your water use and showing where water can be saved in your home.

At no cost to you.

We may able to offer you free products that will help to save water in your home and garden and where the products require a plumber to fit them we will also provide the plumbing free of charge. This is part of our ongoing drive to manage available water resources and reduce water wastage.

In our last H_2eco project all customers received water efficiency products up to the value of £138 (based on RRP).

Call our hotline on 0845 602 6391 to request your Home Survey pack before 25 February 2009

If you would like to take up the offer of a H_2eco Home Survey pack or if you would like any further information, please call our hotline on 0845 602 6391. By accepting this offer you may have the chance to enter a free prize draw with a £200 Red Letter Day voucher to be won.

We look forward to hearing from you and working with you to save water.

Yours sincerely

Tom Andrewartha
Project Manager

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Of Northumbrian Water Limited.
Registered in England & Wales No.2366703
Registered Office: Northumbria House,
Abbey Road, Pity Me, Durham, DH1 5FJ

9.5 Appendix E: Water Savers Report

H2eco
Help the planet, help your wallet.

Recommendations

ESSEX & SUFFOLK WATER

Propref:

Your water use & your potential savings – summarised in this **Personalised Water Savers Report.**

Welcome to your personalised report. From the answers you have given in your H2eco Home Survey we have calculated your shower flow rates, your toilet(s) capacity, and the amount of water you use in your home. We have done this so we can provide product suggestions and water savings specific to you, not only reducing your water consumption, but also helping you save money. We will be contacting you soon to find out if you are interested in a plumber visiting to fit the products (except the water butt which will be delivered to you separately for you to fit) and explain exactly how they work. **This is all free of charge.**

Dual Flush Device
The ecoBETA coverts your existing toilet from a single flush toilet into a dual flush toilet. You still keep your original flush but also have a smaller flush when you push the handle and let go straight away. From the information you provided, an ecoBETA should be suitable for your toilet.
Potential Water Savings in your home = 11200 litres a year

Trigger Hose Gun
Washing your car can use a lot of water. Using a trigger hose gun allows you to turn the hose on and off rather than leave it running helping you save water. A trigger hose gun stops this waste as well as providing 5 different water jets for varied needs.
Potential Water Savings in your home = 117 litres a year

Water Butt
Up to 90000 litres of rain fall onto a typical roof in any one-year, which is enough to fill 473 water butts. Capture rainfall all year round by placing a water butt by sheds, greenhouses and conservatories for use in your garden and home providing a very easy way to save water and money.
Potential Water Savings in your home = 720 litres a year

Miracle Tap
As you have a combined kitchen tap a Miracle Tap Adapter may be able to be fitted. The Miracle Tap adds air to the water flow reducing the amount of water used without the loss of pressure. It also has a spray function for washing vegetables and rinsing recycling and dishes.
Potential Water Savings in your home = 3676 litres a year

Turn over to see how much water and money you could save...

Your potential savings

If you were to follow the recommendations, you could potentially make significant water savings every year.

With the products detailed on this personalised report, which would have cost you £71.99, it could save you...

15713 litres

How water efficient is your home?

Approximately how much water do you use?	Number of people in household				
1 cubic metre = 1,000 litres = 220 gallons	1	2	3	4	5
Very high ■ frequent baths ■ heavy use of washing machine ■ daily use of dishwasher ■ extensive use of sprinkler or hosepipe	120	180	220	255	280
High ■ frequent baths/showers ■ regular use of washing machine ■ dishwasher ■ occasional hosepipe use	90	130	165	200	215
Average ■ mixture of baths/showers ■ prefer showers ■ regular use of washing machine ■ no dishwasher ■ no hosepipe	60	100	130	160	180
Low ■ prefer showers ■ few/no baths ■ no washing machine or infrequent user ■ little/no garden watering	40	75	105	125	145

Water used each year (in cubic metres)

The government has set a target to reduce water consumption across the country from around 150 litres per person per day to 130 litres per person per day. This project is one of the many ways in which we are striving to reach this target. Your calculated consumption is stated below and so puts you in the category highlighted on the table to the left. If you have an appointment and the products offered are fitted then your consumption could decrease helping us to reach that target while providing savings for you.

Your consumption: 110.53 cubic metres per year

By reducing your water consumption, you are not only saving money, but you are also helping to reduce other impacts which are detrimental to the environment. Every drop of water used in your home has been cleaned and pumped long distances. These processes consume huge amounts of electricity. So, ***you*** can really make a difference by conserving water, reducing energy consumption and reducing the amount of carbon released into the atmosphere. No matter how water efficient you are you can still make savings.

Accuracy of advice
The potential savings, in terms of both water consumption and money, are approximations and depend entirely upon the assumptions we have made and the amount of detail given on your H2eco Home Survey. The figures are approximations and may not reflect completely, the actual savings in reality.

We will be in contact with you to arrange an appointment to fit your products, but if you don't hear from us please phone on:
0845 602 6391

H2eco
Help the planet, help your wallet.

www.eswater.co.uk

ESSEX & SUFFOLK WATER

9.6 Appendix F: Supporting Letter for Water Savers Report

H2eco
Help the planet, help your wallet.

ESSEX & SUFFOLK WATER

Property Number:

0845 602 6391

12 May 2009

Dear

***Your* personalised report**

Recently you sent us a completed H_2eco Home Survey booklet which detailed the water use in your home. Thank you very much for taking part in this survey as it will help us to get closer to the Government's target to reduce water use across the country from around 150 litres per person per day to 130 litres per person per day.

As you returned your form promptly we have provided you with a **personalised report**, attached to this letter, which reviews your water use and shows you where water can be used more efficiently in your home. We are offering a range of **free products** to help you save water in your bathroom, kitchen and garden.

We will be contacting you very soon to arrange a time for a qualified plumber to fit your products (except the water butt which will be delivered separately for you to fit) and where necessary take flow or pressure measurements within your home. The plumber will also talk you through the products before they are fitted and will answer any questions that you have. If you haven't heard from us this may be because we haven't managed to get through so please phone us so we can arrange your free product fitting on **0845 602 6391**.

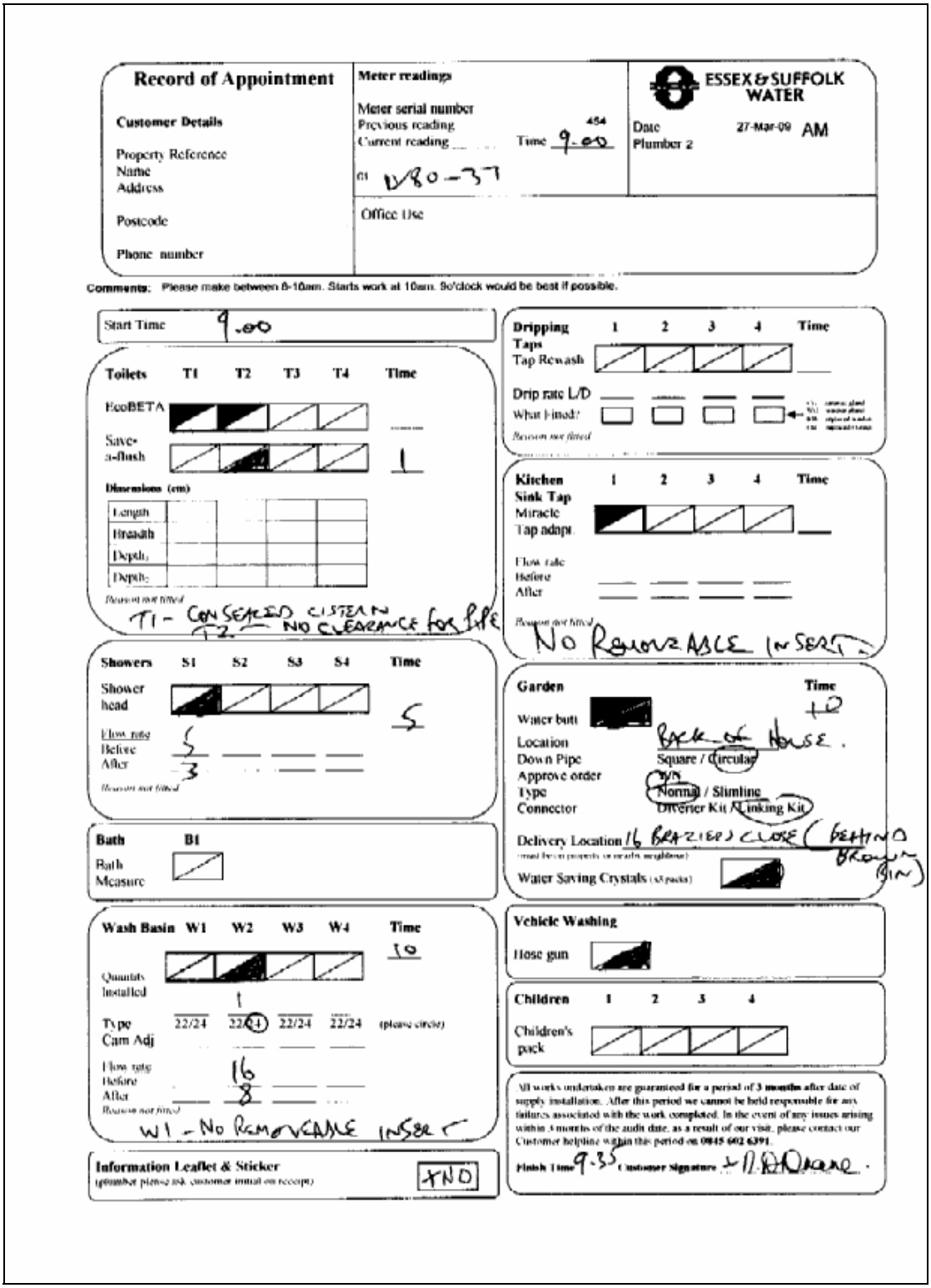
Everybody can save money by saving water, not only those that pay for their water by meter. Those not paying by metered tariff can save money as heating water accounts for about **25% of the energy consumed in the home**. The products that we are offering could help you save money reduce the carbon you use, and help to protect the environment.

Remember, all of the products and facts suggested are proven to save water, and having this one appointment could save you a lot of water and money as well as reduce your carbon and water footprint. Please make sure you have an appointment arranged as you may have the chance to be entered in the **free prize draw** with a **£200 Red Letter Day voucher to be won**.

Yours sincerely,

Tom Andrewartha (Project Leader)

9.7 Appendix G: Completed Audit Sheet



Record of Appointment

Customer Details
Property Reference
Name
Address
Postcode
Phone number

Meter readings
Meter serial number
Previous reading 454
Current reading ___ Time 9.00
01 W80-37

ESSEX & SUFFOLK WATER
Date 27-Mar-09 AM
Plumber 2

Office Use

Comments: Please make between 8-10am. Starts work at 10am. 9o'clock would be best if possible.

Start Time 9.00

Toilets T1 T2 T3 T4 Time
EcoBETA
Save-a-flush 1
Dimensions (cm)
Length
Breadth
Depth1
Depth2
Reason not fitted
T1 - CONCEALED CISTERN
T2 - NO CLEARANCE FOR PIPE

Showers S1 S2 S3 S4 Time
Shower head 5
Flow rate
Before 5
After 3
Reason not fitted

Bath B1
Bath Measure

Wash Basin W1 W2 W3 W4 Time 10
Quantity Installed
Type Cam Adj 22/24 22/24 22/24 22/24 (please circle)
Flow rate
Before 16
After 8
Reason not fitted
W1 - NO REMOVEABLE INSERT

Information Leaflet & Sticker
(plumber please ask customer initial on receipt) YNO

Dripping Taps 1 2 3 4 Time
Tap Rewash
Drip rate L/D
What fitted?
Reason not fitted

Kitchen Sink Tap 1 2 3 4 Time
Miracle Tap adapt
Flow rate
Before
After
Reason not fitted
NO REMOVEABLE INSERT

Garden Time 10
Water butt
Location BACK OF HOUSE.
Down Pipe Square / Circular
Approve order YES
Type Normal / Slimline
Connector Diverter Kit / Linking Kit
Delivery Location 16 BRAZIERS CLOSE (BEHIND BROWN BIN)
Water Saving Crystals (x3 packs)

Vehicle Washing
Hose gun

Children 1 2 3 4
Children's pack

All works undertaken are guaranteed for a period of 3 months after date of supply installation. After this period we cannot be held responsible for any failures associated with the work completed. In the event of any issues arising within 3 months of the audit date, as a result of our visit, please contact our Customer helpline within this period on 0845 602 6391.
Finish Time 9.35 Customer Signature

9.8 Appendix H: Weekly Report

ESSEX&SUFFOLK WATER

Weekly Report (Applications)

Weeks	Totals	07 Feb	14 Feb	21 Feb	28 Feb	07 Mar	14 Mar	21 Mar	28 Mar	04 Apr
Target No of Properties	250	250	250	250	250	250	250	250	250	250
Applications										
No. of invitation letters sent	2492	0	0	0	0	0	0	0	0	0
No. telephone calls received to request packs	116	19	20	58	10	5	3	1	0	0
No. of survey packs sent	631	99	10	296	215	7	3	1	0	0
No. of completed surveys received	248	0	34	17	42	74	55	24	2	0
No. of Water Savers Reports sent via letter	180	0	0	22	14	27	78	31	8	0
No. of Water Savers Reports sent via email	48	0	0	7	4	10	17	10	0	0
No. telephone calls made to arrange appointments	175	0	0	0	29	34	35	54	23	0
No. telephone calls received to arrange appointments	23	0	0	0	8	3	6	4	2	0
No. of appointment confirmation letters sent	87	0	0	0	0	10	20	44	13	0
Phone calls for recruitment process										
No. Phone calls made to recruit customers (mail pack)	2158	0	0	1336	822	0	0	0	0	0
No. Phone calls made to chase survey return	504	0	0	0	47	196	261	0	0	0
Calls not answered	552	0	0	296	256	0	0	0	0	0
Messages left	189	0	0	61	128	0	0	0	0	0
Incorect details	368	0	0	298	70	0	0	0	0	0
Orders cancelled (Customers not interested when Cold Called)	612	0	0	396	216	0	0	0	0	0
Appointments										
No. of appointments booked	198	0	0	0	37	37	41	58	25	0
No. of appointments completed	198	0	0	0	0	36	47	61	54	0
Average No. of appointments completed per day per plumber	5.9875	0	0	0	0	4.75	5	6.6	7.6	0
% of target completed	79%	0%	0%	0%	0%	14%	19%	24%	22%	0%
Remedial visits										
No. of remedial appointments booked	1	0	0	0	0	0	0	0	1	0
Plumber related remedials	0	0	0	0	0	0	0	0	0	0
Customer/device related remedials	1	0	0	0	0	0	0	0	1	0
No of remedial phonecalls incoming	0	0	0	0	0	0	0	0	0	0
No. of remedial appointments completed	0	0	0	0	0	0	0	0	0	0
% Remedials to Audit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Missed appointments										
No. of customer missed appointments	1	0	0	0	0	0	0	0	0	1
No. of Mouchel missed appointments	1	0	0	0	0	0	0	1	0	0
% of Mouchel missed appointments	50%	0%	0%	0%	0%	0%	0%	100%	0%	0%
Written complaints received	0	0	0	0	0	0	0	0	0	0
Meter Reading										
No. of appointment meter readings taken	156	0	0	0	0	25	41	50	40	0
% of props where meter reads could not be taken	79%	0%	0%	0%	0%	69%	87%	82%	74%	0%

9.9 Appendix I: Invoice Report

ESW H2eco				total
Costs		**Unit rate**	**Number Fitted**	**Total**
Project Management				
			Nil	£0.00
Non Plumbing				
Audit pack		£ -	0	£ -
Childrens detective pack		£ 2.00	0	£ -
Bath measure		£ 1.00	0	£ -
Crystals		£ 1.00	0	£ -
Hose gun		£ 1.00	0	£ -
Advice leaflets		£ 1.00	0	£ -
Travel and prep time		£ 7.93	0	£ -
Plumbing				
EcoBETA		£ 18.15	51	£ 925.65
Tap Magic		£ 24.20	71	£ 1,718.20
Miracle Tap		£ 24.20	97	£ 2,347.40
Rewashering		£ 32.07	14	£ 448.98
Showerhead		£ 21.18	34	£ 720.12
Travel and prep time		£ 16.34	194	£ 3,169.96
Save-a-flush		£ 10.59	111	£ 1,175.49
Audit pack		£ 9.08	182	£ 1,652.56
Meter Reading				
Meter reads plumbing audit		£ 3.03	155	£ 469.65
Other				
Customer not at home		£ 30.00	1	£ 30.00
Plumber unable to fit any plumbing devices		£ 30.00	25	£ 750.00
Subtotal				£13,408.01
Discounts	**number in single property**	**Discount**	**Number**	**Total**
EcoBETA	2	-£2.72	10	-£27.23
	3	-£5.04	0	£0.00
	4	-£5.04	0	£0.00
	5	-£5.04	0	£0.00
Save-a-flush	2	-£1.59	28	-£44.48
	3	-£2.94	6	-£17.63
	4	-£2.94	1	-£2.94
	5	-£2.94	0	£0.00
Tap rewashering	2	-£4.81	3	-£14.43
	3	-£8.90	1	-£8.90
	4	-£8.90	0	£0.00
	5	-£8.90		£0.00
Sub Total				-£115.61
Total				£13,292.41

9.10 Appendix J: Assumptions

Product/Service	Assumption	Source
Save-a-flush	Calculated the average number of flushes per toilet per day	ACTUAL DATA - Toolkit application form data
	Device saves 1 litre per flush	Thurrock Home Survey
Aerated showerhead	Av. Time spent in shower = 6.48 mins	Thurrock Home Survey
	Actual average flow rate before = 6.96 l/min	ACTUAL DATA - Toolkit database
	Actual average flow rate after = 4.86 l/min	ACTUAL DATA - Toolkit database
	Device saves on average 27.5%	ACTUAL DATA - Toolkit database
	Av number of showers per week - use actual data from application forms	ACTUAL DATA - Toolkit database
	Sample of 71 properties	ACTUAL DATA - Toolkit database
Shower alarm/timer	41.9% of customers reduce time spent in shower	ACTUAL DATA - Toolkit follow-up questionnaire
	Av time shower reduced by is 1.45 mins	ACTUAL DATA - Toolkit follow-up questionnaire
Bath Indicator	Baths per week = 5.5	ACTUAL DATA - Toolkit database
	41.9% of customer reduce bath depth - assumed same customer response rate as for shower	ACTUAL DATA - Toolkit follow-up questionnaire
	Av. Saving by reducing depth by 2.5cm = 15.34 litres	Bath Volume Calculations
Tap Inserts/Aerators	Device saves on average 47.85%	ACTUAL DATA - Toolkit database
	Actual average flow rate before = 12.29 l/min	ACTUAL DATA - Toolkit database
	Actual average flow rate after =6.53 l/min	ACTUAL DATA - Toolkit database
	Frequency of use is 7.9 per person per day	Code for Sustainable Homes - Technical Guide (March 2007)
	People only open taps to 50% of their full open-tap flow rate	
	Duration per use if 41 seconds	Code for Sustainable Homes - Technical Guide (March 2007)
	therefore 5.4 minutes	Code for Sustainable Homes - Technical Guide (March 2007)
	Sample of 17 properties	ACTUAL DATA - Toolkit database
Dripping tap gauge	Assumes that 15% of customers repaired dripping taps (310 props - 48 repaired taps)	Thurrock Home Survey
	Av. Dripping tap flow rate = 13.08 l/prop/day	Thurrock Home Survey
Miracle Tap Adaptor	Device saves on average 27.1%	ACTUAL DATA - Toolkit database
	Actual average flow rate before = 14.25 l/min	ACTUAL DATA - Toolkit database
	Actual average flow rate after = 10.52 l/min	ACTUAL DATA - Toolkit database
	Frequency of use is 7.9 per person per day	Code for Sustainable Homes - Technical Guide (March 2007)
	Duration per use if 41 seconds	Code for Sustainable Homes - Technical Guide (March 2007)
	therefore 5.4 minutes	Code for Sustainable Homes - Technical Guide (March 2007)
	Sample of 36 properties	ACTUAL DATA - Toolkit database
Tap Rewashering Service	Av. Dripping tap flow rate = 13.08 l/prop/day	Thurrock Home Survey
Hose Gun	Frequency of use per year = 33 times	Thurrock Home Survey
	Av. Time spent using hose per use = 40 mins	Thurrock Home Survey
	Av. Flow rate of 500 l/hr	Thurrock Home Survey
	Device saves 5%	Thurrock Home Survey
Water Storing Crystals	Assumes people use 2 litres of water for 16 weeks of year	Thurrock Home Survey
	Product saves 20%	Thurrock Home Survey
Waterbutt	Assumes people use 45 litres per week for 16 weeks of yr	Thurrock Home Survey
Beaker	Av tap flow rate for brushing teeth is 3 l/min	Thurrock Home Survey
	56% customers said the beaker reminded them to turn tap off when brushing teeth	ACTUAL DATA - Toolkit follow-up questionnaire
	Av saving = 2 l/min	Thurrock Home Survey
	Two teeth brushing events per person per day	Thurrock Home Survey
	Teeth brushing event for 2 minutes	Thurrock Home Survey

9.11 Appendix K: Customer Satisfaction Survey

ESSEX & SUFFOLK WATER

Your satisfaction survey

As your water company, we are constantly striving to provide you with the level of service you require. To help us continue to do that, please spend a few minutes answering the questions below.

Name _____

Address _____

_____

_____

Postcode _____

1) Did the introductory letter clearly explain what the project was about?

☐ Yes ☐ No

2) Were you clear about how the project would operate? (i.e. you had to complete and return the workbook and you would then be telephoned and an appointment would be made to deliver and/or install your products).

☐ Yes ☐ No

3) Did the information book provide you with sufficient information about the products on offer?

☐ Yes ☐ No

4) Did you manage to complete the workbook without any problems?

☐ Yes ☐ No

5) Were you happy with the telephone service?

☐ Yes ☐ No

6) Was the person who made the appointment helpful and courteous?

☐ Yes ☐ No

7) Are you happy with the products you have received?

☐ Yes ☐ No

8) If applicable, are you happy with the quality of the plumbing services?

☐ Yes ☐ No

9) Was the plumber or field technician helpful and courteous?

☐ Yes ☐ No

10) Are you happy with the overall level of service you received?

☐ Yes ☐ No

If you have answered no to any of the above, please provide us with details or any further comments.

_____

_____

_____

What did you find most useful about the project?

_____

_____

_____

Thank you for taking the time to complete the satisfaction survey. Your views and opinions are very useful and will help us to improve future projects.

Please return your satisfaction survey in the pre-paid envelope provided.

9.12 Appendix L: Unit Costs

Product or Service		Cost
Non-Plumbing		
Children's Detective Pack		£0.00
Bath Measure		£0.00
Water Saving Crystals		£0.00
Hose Gun		£0.00
Advice Leaflet		£0.00
Travel and Prep Time		£7.93
Plumbing		
ecoBETA		£18.15
Tap Magic		£24.20
Aerated showerhead		£21.18
Save-a-flush		£10.59
Miracle Tap		£24.20
Tap rewashering		£32.07
Travel and Prep Time		£16.34
Audit Pack		£9.08
Meter Reading		
Meter Reads non plumbing audit		£2.00
Meter Reads plumbing audit		£3.03
Other		
Customer not at home		£30.00
Plumber unable to fit any devices		£30.00
Discounts	**Number in single property**	**Discount**
ecoBETA	2	£2.72
	3	£5.04
	4	£5.04
	5	£5.04
Save-a-flush	2	£1.59
	3	£2.94
	4	£2.94
	5	£2.94
Tap Re washering	2	£4.81
	3	£8.90
	4	£8.90
	5	£8.90

DRAFT