



**ESSEX & SUFFOLK
WATER**

**NW345: SUSTAINABLE WATER
AUDITS RESEARCH**

FINAL REPORT

MAY 2006

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1 EXECUTIVE SUMMARY

1.1 Introduction

In 2005 Essex & Suffolk Water (ESW) wanted to research its water efficiency strategy in terms of comparing the benefits of the various audits in relation to changing customers' behaviour patterns with regards to water usage. Ewan Group plc were appointed by ESW to carry out this research. The research comprised of comparing the effectiveness of six audits, 20 customers were required to participate per audit.

- Retrofit Audit
- Full Audit
- Self Audit
- Children's Audit
- Year Round Education Audit
- One Off Education Audit

1.2 Methodology

Ewan Group plc set out to contact, where possible, all of ESW (924) customers living in the selected housing association properties of Chelmsford, to provide them with information on the project and give them the opportunity to participate in the scheme. From the initial number of participants, Ewan Group plc aimed to recruit 20 customers plus 5 reserve customers each audit, a total of 150 customers. The project comprised of five core stages:

- Stage 1: Database
- Stage 2: Letters
- Stage 3: Telephone Calls
- Stage 4: Initial Survey
- Stage 5: Final Audits.

Ewan Group plc developed a database using Microsoft Access which consisted of 924 customer names, addresses, property reference numbers and where available, customer telephone numbers. Letters outlining the project were sent to all customers on the database between 11th August 2005 and 5th September 2005. As shown below in the following table, 189 properties agreed to participate in the study, of which 56 had contacted Ewan Group plc in response to the letter sent out and 133 customers agreed to participate after receiving a telephone call from Ewan Group plc.

Incoming Calls - Yes	56
Ewan Group plc Follow-up Calls - Yes	133
Customers Not Wishing to Participate	265
Customers Could Not Contact	310
No Telephone Number Available	160
Total Number of Customers	924

Initial surveys were undertaken by between 18th August and 9th September 2006. Although initially 189 customers agreed to take part in the project, of this number only 164 surveys were carried out due customers either changing their mind about participating or not being at home at the agreed appointment time. The main aim of the survey was to gain an understanding of the demographics of the customer and their property.

Of the 164 customers who took part in the initial survey, 136 had a data logger fitted to their water meter, 1 was outside the target postcode, 12 had unsuitable holidays and 15 could not

be logged due to their meter being unsuitable or not found. A logging period of five to six weeks was requested and organised by ESW in order to compare each customer's water use before and after taking part in the audits.

After the logging period of five to six weeks had concluded, the selected customers were contact and informed that they had been selected to take part in a further audit. The final audits were conducted between 24th October 2005 and 4th November 2005.

1.3 Results

The following table shows a quantified comparison between each of the audits, on a scale of 1 to 6, 1 being excellent and 6 being poor.

Audit Type	Ease of Delivering Audit	Potential to Save Water in Household	Cost of Audit per Customer	Take-up wrt Target (20 no.)	Total Score	Position
Retrofit	6.0	1.0	6.0	3.5	16.5	4 th
Full	5.0	5.0	5.0	3.5	18.5	5 th
Self	1.0	3.5	1.0	5.0	10.5	3 rd
Children's	4.0	6.0	4.0	6.0	20.0	6 th
Yr Round	2.5	2.0	2.5	1.5	8.5	1st
One Off	2.5	3.5	2.5	1.5	10.0	2 nd

1.4 Conclusions

A comparison of the findings of the 6 audit types showed that the largest water usage within the participants' homes is flushing the toilet. Taking this finding into account and comparing the results of the audits, it was determined that the Year Round Education audit was the most efficient in terms of cost, time, effort and results. The Children's audit was considered to be the least efficient. A SWOT (Strengths, Weaknesses, Opportunities & Threats) Analysis has been used to summarise the findings of this study.

1.5 Recommendations

- Due to the lack of telephone numbers in the customer database, it may be worth considering tailoring future studies with a larger 'cold call' element.
- The selection process with regards to a study area needs to take into consideration the areas demographics with respect to the scope of the study.
- Use project database as a template for future projects to ensure consistency in approach.
- To increase the Children's audit response rate it may be worth considering simplifying the children's audit to ensure the targeted age group (5yrs) 'buy-in' to the water efficiency concept. Consideration should also be given to changing the age range to say 8-11yrs, as this age band are likely to have a better understanding with regards to water efficiency.
- The shower head de-scaling activity be removed from the Retrofit and Full audits.
- The installation of a new non-electric shower head be removed from the Retrofit audit.
- To increase participation with respect to the Self and Children's audit, there needs to be an added incentive, for example a second voucher.
- To increase customer 'buy-in' with respect to water efficiency, consideration should be given to feeding back the appropriate results to the participating customers, with emphasis on potential water savings (£).

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2 INTRODUCTION

Since 1997 Essex & Suffolk Water (ESW) has undertaken an annual programme of home water audits. Previously, 'full' audits, which involved the assigned contractor fitting a number of devices in the home and undertaking a survey of water use, were used. However, due to financial constraints in 2000 ESW decided this program could only be offered to a limited number of customers.

ESW also adopted a programme of self-audit packs, which are cost efficient and therefore able to be offered to larger number of customers. This strategy focused on educating customers and engaging the customers' commitment to fit water saving devices themselves. Whereas, the full audits did not encourage changes in behaviour.

Each year ESW has reviewed its approach and made a number of modifications to the following years' programme. In 2005 ESW wanted to research its water efficiency strategy in terms of comparing the benefits of the various audits in relation to changing customers' behaviour patterns with regards to water usage. To date ESW is unaware of any formal comparisons between different audits in an approach that is structured and quantified. This 'ground-breaking' research will monitor and measure the effectiveness of the strategies and include an economic evaluation of the strategies.

This program is vital to ESW's reputation as being the leading company in the development of water efficiency in the UK. This project is essential if ESW are to maintain its position as being innovative and progressive in the promotion of water efficiency around the home.

Ewan Group plc were appointed by ESW to carry out this research. The research comprised of comparing the effectiveness of six audits:

- Retrofit Audit
- Full Audit
- Self Audit
- Children's Audit
- Year Round Education Audit
- One Off Education Audit.

20 customers were required to participate per audit, with an additional 5 as reserve. Each participating customer had their water consumption recorded before, during and after the audits.

3 OBJECTIVES

ESW provided Ewan Group plc with 8 project objectives:

- 1) To demonstrate domestic water savings through the provision or fitting of simple, cost effective measures.
- 2) Capture water usage information.
- 3) Provision of tailored advice to household customers.
- 4) Inform and educate households with the messages of water efficiency and using water wisely.
- 5) Identify full costs associated with each audit.
- 6) Measure water savings resulting from the audits.
- 7) Obtain customer feedback on the measures provided and their delivery.
- 8) To compare and evaluate the six proposed audits.

This report will outline how these objectives were achieved, the findings from the audits, limitations and recommendations for future projects of this kind.

4 STAFF

The project organogram is presented in Appendix 1.

Table 1 shows what tasks were undertaken by which team members.

Table 1. Project Staff Activities

Project Task	Resource
Project Director	Rob Williams
Project Manager	Paula Reddin
Database development and maintenance	Paul Wiktorko, Nathan Thomas.
Administration (letters, telephone, data entry)	Nathan Thomas, Hollie Walker, Anthea Sherwood.
Initial survey appointments (telephone)	Hollie Walker, Anthea Sherwood.
Carried out initial survey (field team)	Nigel Davey, James Thompson, Mike Potter.
Audit appointments (telephone)	Anthea Sherwood, Nathan Thomas.
Retrofit audit	Pipeway plumbers (x 2)
Full audit	Pipeway plumbers (x 2)
Self audit	Paula Reddin, James Thompson.
Children's audit	James Thompson.
Year round audit	Paula Reddin, James Thompson, Mike Potter.
One off audit	Paula Reddin, James Thompson, Mike Potter.

5 METHODOLOGY

5.1 Overview

Ewan Group plc set out to contact, where possible, all of ESW (924) customers living in the selected housing association properties of Chelmsford, to provide them with information on the project and give them the opportunity to participate in the scheme. From the initial number of participants, Ewan Group plc aimed to recruit 20 customers plus 5 reserve customers per audit, a total of 150 customers.

The above process is described in detail below.

5.2 Program of Events / Data Collection

This project can be split into five core stages:

- Stage 1: Database
- Stage 2: Letters
- Stage 3: Telephone Calls
- Stage 4: Initial Survey
- Stage 5: Final Audits.

A programme illustrating the timescales of the above stages is presented in Appendix 2.

5.2.1 STAGE 1: Database

For this project ESW, provided Ewan Group plc, with two datasets, the first at the start of the project (683 customers) and the second 2 weeks later (240 customers). From these databases Ewan Group plc developed a database using Microsoft Access (attached as Appendix 3) which consisted of 924 customer names, addresses, property reference numbers and where available, customer telephone numbers.

Figure 1. Project Database

From this database Ewan Group plc were able to initiate the various stages of the project that ranged from organising mailings to customers, recording customer contacts, appointments, any comments and the data from the audit forms collected.

5.2.2 STAGE 2: Letters

Letters outlining the project were sent to all customers on the database between 11th August 2005 and 5th September 2005. In total, 924 letters were sent out during this period. The letters were sent out in postcode batches, as shown in Table 2.

Table 2. Sent Letter Details

Database Letter Batch ID	Database Batch Name	Number of Letters	Date Sent
2	CM1 2	359	11/08/2005
3	CM1 3	136	22/08/2005
4	CM1 4	145	22/08/2005
5	CM1 7	44	22/08/2005
6	CM2 9	3	05/09/2005
7	CM2 0	5	05/09/2005
8	CM2 6	169	05/09/2005
9	CM2 7	63	05/09/2005
	Total	924	

The letter (copy attached as Appendix 4) outlined the aims and objectives of the project and how to contact Ewan Group plc if they wished to participate. Included with the letter was a fridge magnet, which was used as a point of reference in Stage 3.

5.2.3 STAGE 3: Telephone calls

Customers, who following receipt of the introduction letter called the local rate telephone number, were asked if they would be willing to have a survey undertaken. Those who were agreeable to this were booked an appointment for the survey to be conducted at their earliest convenience. All appointments were logged on the database.

Those customers, who had not called Ewan Group plc to ask for a survey to be carried out, received a telephone call from a member of Ewan Group plc, within 14 days after the notification letter would have reached them. Of the 924 customers referenced in the database, 240 customers did not have a telephone number. To identify the missing telephone numbers, BT Phone Disc was used. In total, 88 numbers were identified using BT Phone Disc.

The telephone calls to potential participants of the project were made between the 15th August 2005 and 8th September 2005, typically between the times of 5pm and 8pm on weekdays. Calls were made between these times, as this was when Ewan Group plc gained the highest contact rate.

During the telephone calls, the targeted customers were asked if they remembered receiving a letter from ESW that included a fridge magnet. The fridge magnet proved in many cases to be a useful reminder especially if they could not remember the letter. If they were interested in participating an appointment time was agreed upon and booked on the database. The telephone script that was employed is presented Appendix 5.

As shown below in Table 3, of the 189 properties that agreed to participate, 56 customers had contacted Ewan Group plc in response to the letter sent out and 133 customers agreed to participate after receiving a telephone call from Ewan Group plc.

Table 3. Details of Communication

Incoming Calls - Yes	56
Ewan Group plc Follow-up Calls - Yes	133
Customers Not Wishing to Participate	265
Customers Could Not Contact	310
No Telephone Number Available	160
Total Number of Customers	924

When booking an appointment, the database required various fields (call type, participation, appointment date and time) to be filled in. The database also allowed for any reasons from customers not wishing to take part to be noted down, as shown below in Figure 2.

Figure 2. Project Database: Phone Calls

Reference No	
Name	
Address 1	
Address 2	
Town	
Post Code	
Home Number	
Contact Number	

Call Type	
Participation	
Reason for Non-Participation or Comments	

Extras Delivered

01/03/2006 13:04:55

Appointment:

Save And Close Exit

5.2.4 STAGE 4: Initial Survey

The initial surveys were undertaken by one of Ewan Group plc field technicians during the agreed appointment time (between 18th August and 9th September 2006). Although initially 189 customers agreed to take part in the project, of this number only 164 surveys were carried out due customers either changing their mind about participating or not being at home at the agreed appointment time.

The field technicians, with the customers' participation, completed the initial survey form, which is presented in Appendix 6. The main aim of the survey was to gain an understanding of the demographics of the customer and their property. Each customer who took part in the survey received a £10 Tesco voucher either at the time of the survey or within a week by post. The customer was told about this at the initial phone call to help encourage them to participate.

The completed surveys were entered onto the database so that the customers could be selected for the respective audits.

5.2.5 STAGE 5: Final Audits

Of the 164 customers who took part in the initial survey, 136 had a data logger fitted to their water meter, 1 was outside the target postcode, 12 had unsuitable holidays and 15 could not be logged due to their meter being unsuitable or not found. Holidays at the beginning and end of each logging period were assessed on an individual basis to ensure that each customer would be home for at least five continuous weeks before the 24th October and after the 7th November. A logging period of five to six weeks was requested and organised by ESW in order to compare each customer's water use before and after taking part in the audits.

The steps taken to select the customers for each audit type are presented below:

- 1) Customers (13) who were identified as having children in the 5-12 years age group were selected for the children's audit.
- 2) The remaining 123 customers were sorted into 3 groups; those with siphon toilets, those with valve toilets and those with slimline or concealed cisterns.
- 3) The group with siphon toilets were sorted into those with servicing valves and those without.
- 4) Of the group with isolating valves the first 25 were picked for the retrofit audit group. (The retrofit audit could only be carried out on siphon toilets of 6 litres or greater that were fitted with an isolating valve).
- 5) The remaining 98 customers were sorted into those with slim-line toilets and those without. The self audit pack contains a save a flush device which is less suitable for slimline cisterns and therefore the 25 self audit customers were chosen from the group without slim-line cisterns.
- 6) The remaining 73 customers were divided randomly into two groups of 24 and one of 25 for the year long education, one off education and full audits.

Properties, which received an initial survey, but were not considered as being suitable for one of the six audits, were given a DIY Survey pack by ESW. As these customers were interested in water efficiency, ESW wanted to follow up their initial survey by providing them with further information. These packs will consist of:

- Save-a-flush cistern displacement device
- Audit workbook including audit completion form
- Reply paid envelope for return of the audit form
- Using Water Wisely leaflet
- Tea towel
- Magnet.

After the logging period of five to six weeks had concluded, a member of Ewan Group plc contacted the selected customers via telephone and explained that they had been selected to take part in an audit. Appointments with willing participants were made and the audits were conducted between 24th October 2005 and 4th November 2005. This period was chosen as a suitable time to conduct the audits, as it covered the schools half term break when the children would be available during the day and parents were more likely to be at home for the other audit types.

Experienced plumbers and field technicians carried out the six audits. Details of the respective audits are provided below:

Retrofit Audit

This audit consisted of fitting:

- Dual flush toilet conversion devices
- Showerheads
- Mending any dripping taps.

As part of this audit type there were three types of toilet conversion devices: Variflush, Ecoflush and Dudley Turbo 88.

The Variflush and Ecoflush devices provide three levels of flush volume: minimum, medium or a maximum flush. Both devices have a dial on the outside of the cistern to allow the user to choose which setting they wish to flush at.

The Dudley turbo 88, unlike the Variflush and Ecoflush devices, replaces the whole siphon in the toilet cistern and is attached to the original toilet handle. When the level is depressed and released the full original flush is used. However, if the handle is depressed and held down a reduced flush will be utilised.

Where practical new non-electric showerheads were fitted, existing non-electric shower heads were de-scaled. Shower flow rates were measured, before and after any work was carried out. A shower that had a flow rate of less than 10 litres per minute was classed as water efficient.

Any dripping taps had the washers replaced, as to avoid wasting water unnecessarily. This project did not permit the whole tap to be replaced.

Full Audit

The Full Audit involved:

- Measuring the flow rates of any dripping taps using a drip flow gauge
- Re-washing any dripping taps, which did not have ceramic discs
- Detecting any internal and external leaks
- Installing a save-a-flush device in all suitable toilet cisterns
- Overflow detection and prevention
- Repairing and replacing ball cocks where necessary
- Surveying pipe-work, stop taps and giving appropriate advice to the householder/council where insulation is required
- De-scaling shower head.
- Measuring the shower flow rate using the shower flow bag before and after the alterations
- Providing an information pack to customers
- In addition to the above, water butts were delivered separately to the participants of this audit. Where water butts could not be fitted, customers were offered a trigger hose attachment to use when watering the garden or washing the car.

Self Audit

For this audit ESW provided "Home Water Survey packs", which contained:

- Save-a-flush cistern displacement device
- Shower flow rate assessment bag
- Drip gauge (to measure flow rate from dripping taps)
- Shower timer
- Trigger Hose gun
- Audit Workbook including Audit Completion Form
- Reply paid envelope for return of the Audit Form
- Using Water Wisely leaflet
- Shower hat
- Water storing crystals
- Collapsible beaker.

Assisted audits were provided to customers who were unable to complete all/part of the "Home Water Survey" pack. For these the fieldwork technicians who delivered the pack demonstrated the respective contents of pack to the customer, and completed the various tasks. Tasks included installing the save-a-flush cistern displacement device and water storing crystals, measuring shower and dripping tap flow rates, and completing the audit form.

Children's Audit

In the presence of the parent, the field technician showed the child/children the pack that contained the same items as found in the self audit packs. Also included in the pack was an audit form, which was explained to child/children, and they were encouraged to complete and return the forms in the pre-paid envelope provided.

Year Round and One Off Education Audit

These audit types involved a field technician assisting a customer to estimate the amount of water they use weekly by completing an audit form. The logged consumption data was used to inform the customers if they had under estimated their water usage. A copy of the form is enclosed as Appendix 7. In addition, customers were also offered the following:

- Using water wisely leaflet
- Save a flush
- Gardening leaflet
- Children's leaflet
- Hints and Tips on saving water.

The only difference between these two audits is that ESW will continue with the year long education audit whereas, the one off education audit will not be followed up.

The results for each audit type are presented and discussed in the following section.

5.2.6 Participation Incentives

Customers who participated in the initial surveys received a £10 Tesco voucher.

A first prize of £100, and 5 runner-up prizes of £20 were awarded following the collection of the audit forms.

6 RESULTS

This section presents the findings of each of the audit types and compares the audit types in terms of effectiveness and economic value.

A full breakdown of the results collected for each of the audits can be found in the database. Summaries of the costs are also presented in Appendix 8.

6.1 Retrofit Audit

Ewan Group plc set out to complete 20 retrofit audits. However, only 19 properties, including the reserves, agreed to participate. A sample of 19 was only achieved as of the selected 25 properties for this audit, 1 customer could not be contacted and 5 customers did not wish to take part in the final audit. The reasons cited by the customers not wishing to take part was because they had either just had their bathroom refitted, did not recall taking part in the initial survey, or did not wish to take any further part in the project.

The total number of properties that participated in each task is presented in Table 4 below:

Table 4. Retrofit Audit Participation

Retrofit Tasks	Total	%
Shower Flow Rates Measured	18	95%
Electric Shower Head Descaled	0	0%
New Non-Electric Shower Head Fitted	1	5%
Existing Toilet Isolating Valve	17	89%
Toilet Ecoflush Fitted	2	11%
Toilet Variflush Fitted	5	26%
Toilet Dudley Turbo 88 Flush Fitted	10	53%
Dripping Taps	1	5%
Taps Re-washed	1	5%
Save-a-flush Installed	19	100%

18 shower flow rates were measured, as 1 of the participants did not have a shower. None of the participants who had a shower had their showerhead descaled, as their showerheads were rubber and therefore were not suitable for descaling. The plumbers were only able to change one showerhead, as all the other showerheads were specifically compatible with the electric shower system already installed.

Out of the possible 19 properties, 17 had dual flush conversion fitted. This is because one customer actually did not have an isolating valve fitted and another customer refused to have any of the devices fitted as it would have meant that the customer's gold flush toilet handle would be replaced. In the last instance the customer asked to have a save-a-flush instead of having any of the dual flush conversion devices fitted.

The plumbers tested all taps to see if any were dripping within the selected properties and only found one property which had one dripping tap in the kitchen. The dripping tap only required re-washing.

On average the audit took approximately 2 hrs to complete, completion times varied between approximately 1.5 and 3 hrs. The Dudley Turbo 88 flushing device took additional time to fit compared with the Ecoflush and Variflush devices. Dripping taps requiring re-washing also impact on the duration of the audit.

The overall cost for this audit type was £3,456.51 (£181.92 per audit, based on 19 participants). A breakdown of this cost is presented in Table 5.

Table 5. Breakdown Of Retrofit Audit Costs

Breakdown	Cost
Ewan Group plc costs	£2,688.50
ESW costs	£562.57
Material costs:	
• Variflush (x5) cost	£47.50
• Ecoflush (x2) cost	£15.00
• Dudley Turbo 88 (x10) cost	£142.30
• Save-a-flush (x1) cost	£0.64
Total	£3,456.51

6.2 Full Audit

Ewan Group plc set out to complete 20. However, only 19 properties, including the reserves, agreed to participate. A sample of 19 was only achieved as of the selected 25 properties for this audit type 3 customers could not be contacted, 2 customers did not wish to participate as they were going on holiday and 1 customer, who although initially agreed to take part, changed their mind at the last minute. A save-a-flush and leaflets were given to the customer who changed their mind about participating in this audit, although no information about their water usage was collected.

The total number of properties that participated in each task is presented in Table 6 below:

Table 6. Full Audit Participation

Full Audit Tasks	Total	%
Shower Flow Rates Measured	13	68%
Descaled Shower Head	0	0%
Fitted Toilet Save A Flush	19	100%
Number of Dripping Taps	0	0%
Taps Re-washed	0	0%
Number Requested Water Butts	7	37%
Number Provided with Hosegun	12	63%
Any Leaks?	0	0%

Of the participating 19 properties, 13 properties had their shower flow rates measured. This is because 5 properties did not have a shower and a shower in 1 property was broken. Of the properties that did have a shower, none of the properties had their showerhead descaled as the showerheads were rubber and not suitable.

All 19 properties had a toilet save-a-flush fitted.

There was not a requirement for any taps to be re-washed, as there were no dripping taps identified. No leaks were found either. A plumber did identify taps in one property, which could possibly seize and advised that the taps be changed.

All 19 participating properties were offered a water butt, however only 7 customers requested to receive a water butt. The other 13 customers did not request a water butt either because they did not have garden or any space for one or did not think they would use it. As many of the participants were elderly they may not have had the mobility to water a garden, and therefore would not have the need for a water butt.

On average the audit took approximately 1 hr to complete.

The overall cost for this audit type was £3,398.51 (£178.86 per audit, based on 19 participants). A breakdown of this cost is presented in Table 7 below.

Table 7. Breakdown Of Full Audit Costs

Breakdown	Cost
Ewan Group plc costs	£2,688.50
ESW costs	£562.57
Material costs:	
• Design of leaflet (x19) cost	£76.00
• Printing of leaflet (x19) cost	£59.28
• Save-a-flush (x19) cost	£12.16
• Hosegun (x12) cost	£5.88
Total	£3,404.39

This total excludes £147.00, which accounts for the 7 requested water butts priced at £21.00 each. This cost will be covered by ESW.

6.3 Self Audit

Of the 20 self-audits packs that were delivered, 60% (12) customers completed and returned their forms. In total, 5 assisted audits were carried out on behalf of elderly customers.

Some of the key points are identified below:

- 75% (9) of the audit forms returned were from single occupant dwellings
- 75% (9) of the participants said they had fitted the save-a-flush provided
- 92% (11) of the participants do not have any dripping taps
- 33% (4) of participants will use the hose gun provided
- 83% (10) of participants who will use the water storing crystals
- 83% (10) of the participants use a shower
- The average shower time is 4.5 minutes and the average flow-rate is 3.6 l / minute.

On average the hand-over of the audit to the customer took approximately 2-5 minutes to complete.

The overall cost for this audit type (excluding overhead costs) was £980.67 (£49.03 per audit, based on 20 participants). A breakdown of this cost is presented in Table 8 below.

Table 8. Breakdown Of Self Audit Costs

Breakdown	Cost
Ewan Group plc costs	£366.30
ESW costs	£562.57
Material costs:	
• Audit pack (x20) cost	£51.80
Total	£980.67

6.4 Children's Audit

Of the 13 children's audit packs delivered only 15% (2) returned the completed form. Some of the key points are identified below:

- 50% (1) had a shower
- None of the participants had any dripping taps
- All participants take 2 minutes to brush their teeth and will use the beaker provided
- All participants have fitted a toilet save-a-flush
- All participants will use the hose gun provided.

These results are limited due to the low response rate and the returned surveys being incomplete.

A poor response rate can be related back to a number of factors regarding the survey, availability and incentives. One reason could be that the audit form was too complex and the calculations too hard for the target age range of 5-11 year olds to complete. Also the tone and layout of the audit form was pitched differently to the tailored children's leaflet, which was included with the audit form. This may have resulted in a lack of enthusiasm and distraction to complete and return the audit forms. Availability could also be another factor, as the participants may not have had the time to complete the survey.

The respective customers were contact up to 3 times following the audit to encourage the customer to complete and return the audit form.

On average the audit took approximately 5 – 10 minutes.

The overall cost for this audit type is £1,012.31 (£77.87 per audit, based on 13 participants). A breakdown of this cost is presented in Table 9 below:

Table 9. Breakdown Of Children's Audit Costs

Breakdown	Cost
Ewan Group plc costs (Excluding overhead costs)	£216.00
ESW costs	£562.57
Material costs:	
• Audit pack (x13) cost	£33.67
• Design of leaflet (x13) cost	£104.00
• Printing of leaflet (x13) cost	£96.07
Total	£1,012.31

6.5 Year Round and One Off Education Audits

40 properties (20 properties per audit type) undertook the year long and one off education audit. The overall estimated average weekly household water usage (per person) for this sample was 829 litres. The logged flow data taken for the participating properties showed an average weekly consumption of 848 litres. Table 10 presents this information.

Table 10. Variance Between Actual Consumption And Estimate Water Usage

Customer	Estimated Usage (litres/wk/person)	Meter Read Consumption (litres/wk/person)	Variance (%)
1	458.0	390.0	17.4%
2	603.0	505.0	19.4%
3	1018.0	1325.7	-23.2%
4	249.0	285.0	-12.6%
5	1387.0	1241.4	11.7%
6	830.0	722.9	14.8%
7	1011.0	527.2	91.8%
8	785.0	692.0	13.4%
9	362.0	890.0	-59.3%
10	722.0	771.7	-6.4%
11	391.5	429.2	-8.8%
12	1021.0	775.0	31.7%
13	1288.0	1544.0	-16.6%
14	929.0	460.0	102.0%
15	819.0	907.1	-9.7%
16	1385.0	1340.0	3.4%
17	650.5	835.9	-22.2%
18	434.5	394.2	10.2%
19	518.0	925.7	-44.0%
20	1296.0	1297.1	-0.1%
21	1596.0	626.7	154.7%
22	1203.0	1703.3	-29.4%
23	492.0	968.3	-49.2%
24	1149.0	1440.0	-20.2%
25	320.3	701.9	-54.4%
26	468.7	671.7	-30.2%
27	467.0	921.0	-49.3%
28	1047.0	1181.7	-11.4%
29	951.0	1061.7	-10.4%
30	688.0	1066.7	-35.5%
31	523.0	448.6	16.6%
32	1270.0	736.7	72.4%
33	1210.0	1090.0	11.0%
34	1544.0	965.0	60.0%
35	765.0	671.7	13.9%
36	424.0	870.0	-51.3%
37	523.0	348.0	50.3%
38	1018.5	1167.2	-12.7%
39	658.0	147.1	347.3%
40	676.0	866.7	-22.0%
Average	828.8	847.8	11.6%

Key:	+/-15% Variance	+/-15-30% Variance	>+/-30% Variance
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Figure 3 presents the participants estimated average water usage with regards to the various activities.

Figure 3. Average Estimated Weekly Water Use

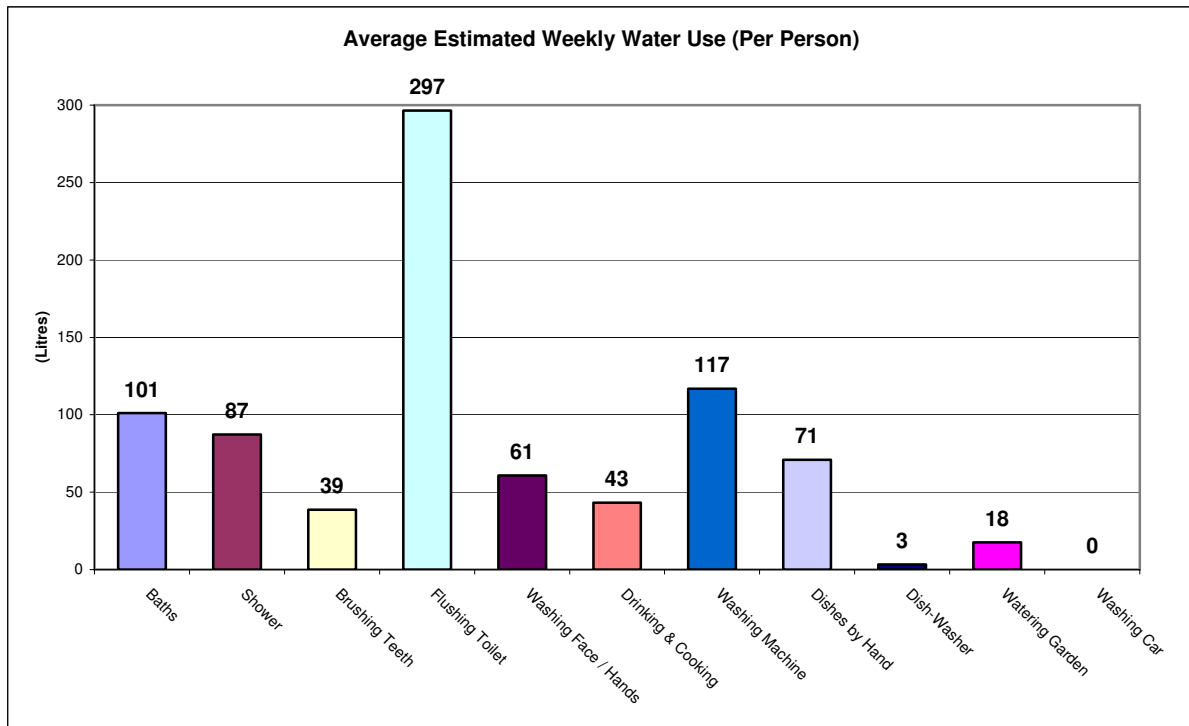


Table 11. Percentage of Estimated Weekly Water Used on Each Activity

Activity	(%)
Baths	12%
Shower	10%
Brushing Teeth	5%
Flushing Toilet	35%
Washing Face / Hands	7%
Drinking & Cooking	5%
Washing Machine	14%
Dishes by Hand	8%
Dish-Washer	0%
Watering Garden	2%
Washing Car	0%

With reference to Figure 3 and Table 11 the participants of these audit types estimated that flushing the toilet uses the greatest amount of their water usage.

Participants allocated the least amount of water to washing the car. This could be referred back to the demographics of the participants, in particular the age range. As most of the participants which undertook these audit types were elderly, their needs and thus, water usage would considerably differ to that of a young family, who for example may be more likely to use a car.

Outlined below are the key points found from carrying out these audits:

- It is estimated that on average 101 litres of water (per person) is used a week for a bath
- It is estimated that 87 litres of water (per person) is used for showers
- 60% (24) of the audited properties do not have a shower
- It is estimated 297 litres of water is used for flushing toilets. 22.5% (9) of the audited properties have a toilet, which flushes less than 9 litres
- It is estimated that 117 litres is used for washing machines
- It is estimated that 18 litres is used for watering the garden per week.

Although this data does provide an insight into the water usage of participants it should however be approached with caution and not used to generalise ESW customers, as the participants of these audits cannot be classed as a true representative sample, as the majority, 95% (38) of the participants, were elderly and would therefore tend to use less water than younger people.

On average the audit took approximately 30 – 60 minutes to complete.

Table 12 & 13 present a breakdown of the costs for the year long and one off education audits. The overall cost for each of these audit type is approximately £1,350 (£67.50 per audit).

Table 12. Breakdown Of Year Long Audit Costs

Breakdown	Cost
Ewan Group plc costs (Excluding overhead costs)	£773.40
ESW costs	£562.57
Material costs:	
• Save-a-flush (x16) cost	£10.24
• Children's leaflet (x3) cost	£1.35
• Water conservation leaflet (x20) cost	£2.80
• Garden leaflet (x6)	£0.66
Total	£1,351.02

Table 13. Breakdown Of One Off Education Audit Costs

Breakdown	Cost
Ewan Group plc costs (Excluding overhead costs)	£773.40
ESW costs	£562.57
Material costs:	
• Save-a-flush (x19) cost	£12.16
• Children's leaflet (x2) cost	£0.90
• Water conservation leaflet (x20) cost	£2.80
• Garden leaflet (x6)	£0.66
Total	£1,352.49

6.6 Large Scale Project Cost Estimates

The estimated project costs for completing 10,000 of the respective audits are presented below. These costs are based on the actual costs of this project.

Table 14. Project Costs For Completing 10,000 Audits

Audit Type	Estimated Project Cost
Retrofit	£1,404,254.44
Full	£1,111,985.97
Self	£257,459.69
Children's	£236,190.12
Yr Round	£461,859.06
One Off	£461,859.06

A full breakdown of the above costs, and assumptions, is presented in Appendix 9.

6.7 Summary

Table 14 shows a quantified comparison between each of the audits, on a scale of 1 to 6, 1 being excellent and 6 being poor. The table takes into account Ewan's views and opinions, and their experience of managing the project.

Table 15. Comparing Audits

Audit Type	Ease of Delivering Audit	Potential to Save Water in Household	Cost of Audit per Customer	Take-up wrt Target (20 no.)	Total Score	Position
Retrofit	6.0	1.0	6.0	3.5	16.5	4 th
Full	5.0	5.0	5.0	3.5	18.5	5 th
Self	1.0	3.5	1.0	5.0	10.5	3 rd
Children's	4.0	6.0	4.0	6.0	20.0	6 th
Yr Round	2.5	2.0	2.5	1.5	8.5	1st
One Off	2.5	3.5	2.5	1.5	10.0	2 nd

6.7.1 Ease of Delivering

Ease of completing audit refers to the time and effort spent undertaking each of the audits and the customers' willingness to participate in the audits.

The self audits were given a rating of 1, excellent, as it was straight forward to distribute the packs to the recruited 20 customers allocated for this audit type, despite only receiving 12 completed audit forms back. This audit type was considered to be time efficient compared to the others.

A rating of 6, poor, was given to the retrofit audits because the uptake of the audit type was low, as out of the potential 25 customers only 19 participants could be recruited to take part. This audit type was judged to be time consuming as appointments were booked in 1.5 hour slots and involved the co-operation of the customer with regards to booking a suitable appointment time.

6.7.2 Potential to Save Water

Although the retrofit audits received the lowest rating for ease of delivery, they were awarded a rating of 1 for the potential to save water in the household. This is because across all the audits it was identified that the largest water usage within the participants' homes is flushing the toilet, thus, this should be a key point of focus in order to reduce the amount of water used in the home. The retrofit audits with the Ecoflush, Variflush and Dudley Turbo 88 flush (which has the potential to save more water than a save-a-flush) focused on this key issue, as well as setting out to inform, educate and provide the expert knowledge of the plumbers to the participants on saving water.

The self and one off education audits were rated equally as the self audit provides the customer with a large amount of information, and this is 'equalled' by the time spent with the customer (approximately half an hour) during the one off education audit.

The children's audits received a rating of 6 for this category, as this audit type did not have a strong potential to affect the water usage within a household. This is because the children's audits seemed to be too complex for the targeted age group, that they may not have fully understood the audit and therefore been lacking in enthusiasm to complete the audit. This is supported by the low response rate for this audit type. In view of this it is unlikely that this audit will not have any long-term effect in the children's behaviour and attitude towards water usage.

6.7.3 Cost

The costs for each audit type were calculated at a cost of per participating customer, as to work out the most cost efficient audit type. As the self audit was the cheapest audit type it was awarded a rating of 1, whereas, the retrofit audit received a rating of 6 as it was the most expensive audit type.

6.7.4 Take-up

The Year Round and One Off audits achieved 100% (20 customers per audit) participation, and therefore were awarded a rating of 1.5 ($1+2/2=1.5$). The Children's audit received the lowest rating of 6 as only 2 audit forms were returned.

6.7.5 Summary

Overall, the Year Round education audit appears to be the most efficient audit type, and the Children's Audit to be the least efficient.

7 CUSTOMER SATISFACTION

7.1 Customer Complaints

In the initial survey stage, 2 letters of complaint were received with regards to missed appointments. Each customer was contacted, sent a letter of apology and awarded £30 as compensation.

The complaints occurred due the field team not identifying specific appointment times. Both customers had asked for an evening appointment (5pm-7pm), which was correctly logged on the database. However, both of these customers had requested specific time slot towards the end of the evening appointment period, which was noted in the comments box on the database. The field team however did not identify the specific appointment times, but instead arrived at the beginning of the evening appointment period, therefore missing the customer.

Both customers who complained were offered the opportunity to book another appointment, to have the initial survey carried out. Each customer agreed to have the audit carried out and if suitable they were put forward for an audit. One of these customers did participate in a final audit type.

7.2 Customer Feedback

All the customers who were assisted by a field technician for the retrofit, full, one off and year long audits, received a customer's satisfaction survey to complete. In order for customers to be entered into the prize draw they had to complete and return this survey. Out of a total of 78 customer satisfaction forms, 64% (50) of the forms were completed and returned. A summary of the results from the surveys received back is displayed in Table 15 below.

Table 16. Customer Feedback

Question	Yes	No	Blank	Overall Satisfaction
Was the information provided helpful?	49	0	1	98%
Were you advised of the survey appointment?	49	1	0	98%
Was the person who made the appointment polite?	50	0	0	100%
Was the appointment kept?	50	0	0	100%
Was the surveyor helpful and courteous?	50	0	0	100%

Table 15 shows that the customers who participated in the final audit were very satisfied with the service they received. This positive feedback is reinforced further by customer comments such as:

“The visit was interesting and informative.”

“This was very informative, really everybody needs to know how to save water.”

“They made no fuss. Did what they had to do and went.”

“We are very pleased with your service. Brilliant. Thank you.”

No negative feedback was received. A full breakdown of the customers' satisfaction forms is presented in Appendix 10.

8 CONCLUSION

A comparison of the findings of the 6 audit types showed that the largest water usage within the participants' homes is flushing the toilet. Taking this finding into account and comparing the results of the audits, it was determined that the Year Round and One Off audit types were the most efficient in terms of cost, time, effort and results. The Children's audit was considered to be the least efficient.

A SWOT (Strengths, Weaknesses, Opportunities & Threats) Analysis has been used to summarise the findings of this study.

STRENGTHS:

General

- Team of professionals – project management team, plumbers etc- appointed Ewan Group plc.
- All resources and materials for project either available through ESW or Ewan Group plc.
- Clients already have a relationship with ESW water so more likely to participate in project – relationship already in place.
- Positive feedback for all participants.
- Majority of the field team possessed knowledge of the area as they all lived locally.
- Project database facilitated project delivery, and can be used on similar future projects.

Audits

- 100% participation was achieved for the Year Round and One Off audits. These audits also produced a detailed data set.
- The Self audit was easy to implement and was the most cost effective.
- The Retrofit audit has the potential to save the largest volume of water.

WEAKNESSES:

This study, although it provides a useful insight into the comparison of the 6 audit strategies, is limited by a number of factors, listed below:

General

- Database did not hold all customers' contact details and some details that it did have were incorrect.
- The demographics of the area and participants were not appropriate for some of the audit types. For example, the customers recruited in the initial survey did not comprise of 20 (excluding 5 reserve) families with children who were suitable for the children's audit.
- The majority of the participants were elderly and retired.
- A large percentage of the results were from single occupancy dwellings.

Audits

- The uptake did not reach the target of 20 participants for the retrofit, full and children's audit types, thus, limiting the findings. However, this can be referred back

to there not being candidates with suitable demographics to participant in these audit types, specifically, the children's audit type.

- A low response rate limited the findings of the self and children's audit. The complexity of the latter for the targeted age group may have contributed to this. The children they may not have fully understood the audit and therefore been lacking in enthusiasm to complete the audit.
- The reliability of the findings for the children's and self audits should be handled with caution, as there were no procedures put in place to ensure that the information supplied by the participants was correct and not bias.
- Some customers did not fully complete their audit forms for the children's and self audits.
- Shower head de-scaling (Retrofit and Full audit) on the whole was a redundant task as it could not be carried out.
- A limited number of new non-electric shower heads (Retrofit audit) were fitted.

From these limitations it can be concluded that these findings cannot be generalised and labelled a representative sample because they do not fairly represent the ESW's customer population and thus the water usage.

OPPORTUNITIES:

- Opportunity to raise awareness of water efficiency.
- Project demonstrates corporate social responsibility (CSR); customers from other water companies may see or hear about this project and change their water supplier to ESW.
- Improve future projects of this kind.
- High customer satisfaction feedback – able to contact them again to further study.

THREATS:

- Previous projects limiting project scope development
- Future legislation
- Customer access.

9 FUTURE RECOMMENDATIONS

General

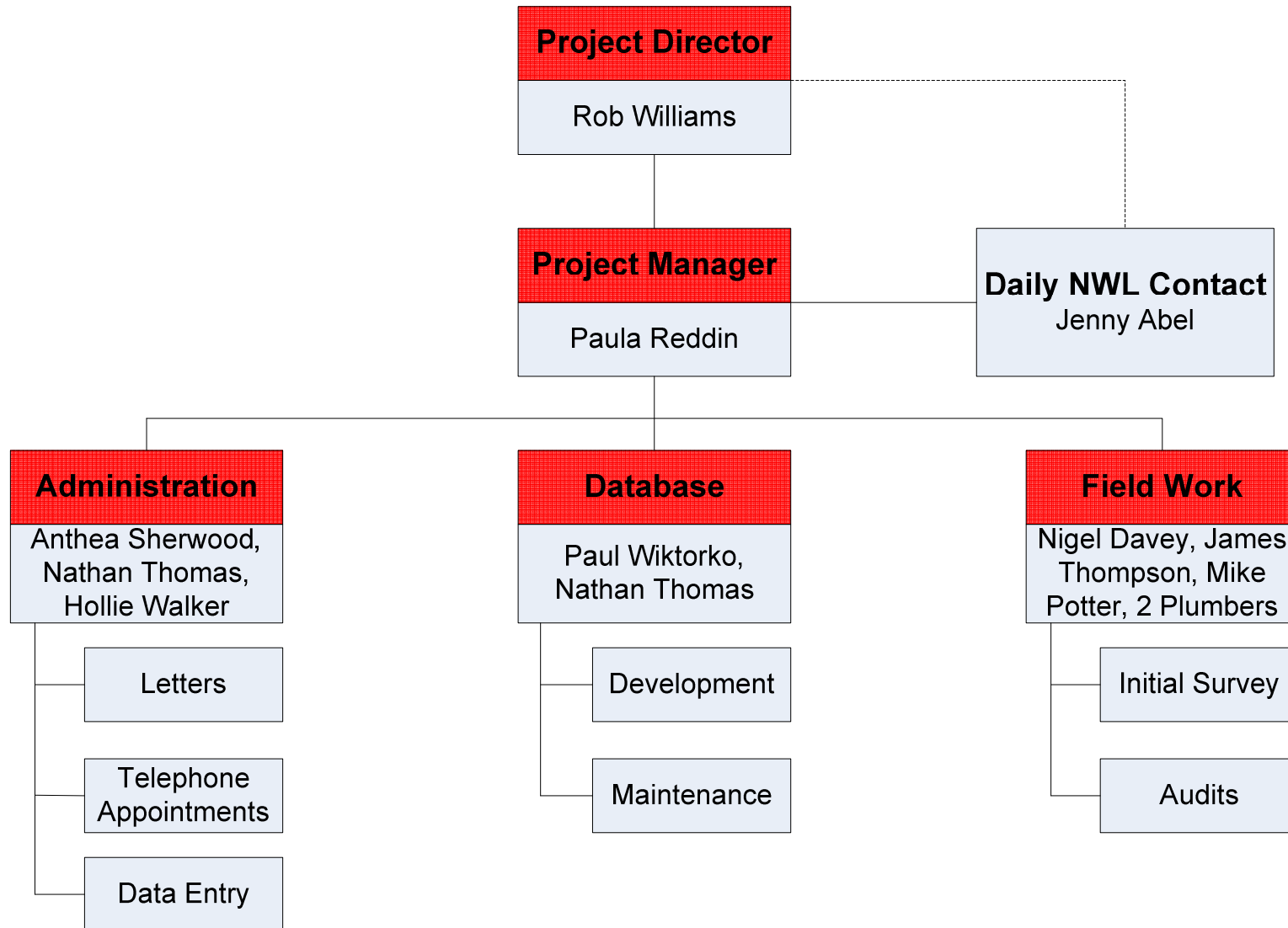
- Due to the lack of telephone numbers in the customer database, it may be worth considering tailoring future studies with a larger 'cold call' element.
- The selection process with regards to a study area needs to take into consideration the areas demographics with respect to the scope of the study, to ensure:
 - Appropriate number of customers have children
 - There is a adequate spread of customer ages, i.e. not all elderly and retired
 - Occupancy numbers are varied appropriately.
- Use project database as a template for future projects to ensure consistency in approach.

Audit

- A low response rate limited the findings of the self children's audit. It may be worth considering simplifying the children's audit to ensure the targeted age group (5yrs) 'buy-in' to the water efficiency concept. Also, consideration should be given to changing the age range to say 8-11yrs, as this older age band are likely to have a better understanding with regards to water efficiency.
- The shower head de-scaling activity be removed from the Retrofit and Full audits.
- The installation of a new non-electric shower head be removed from the Retrofit audit.
- To increase participation with respect to the Self and Children's audit, there needs to be an added incentive, for example a second voucher. With regards to the Children's audit the voucher could be in the form of a book token or cinema ticket.
- To increase customer 'buy-in' with respect to water efficiency, consideration should be given to feeding back the appropriate results to the participating customers, with emphasis on potential water savings (£).

10 APPENDICES

Appendix 1 – Project Organogram



Appendix 2 – Gantt Chart

Appendix 3 – Project Database

Appendix 4 – Notification Letter



< [REDACTED] >

[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

23 January 2006

Dear [REDACTED]

Water Efficiency Project

As a valued Essex & Suffolk Water customer, we would like to invite you to take part in our latest water efficiency project. As an introduction to the study, we enclose a magnet with our compliments.

By participating, you will not only be learning to make your home more water efficient, but could also save money by reducing your water bills. You will also be providing us with valuable data to help us plan for the future. To take part, you will need a 15 minute visit from one of our surveyors to gather information regarding your water using appliances. We are offering free plumbing solutions, children's education, survey packs and education coupled with free water saving devices. To arrange an appointment or for more information, please contact us on 0845 6010 147 between 8:30am and 8:00pm Monday to Friday.

As a reward for offering to take part in the initial selection of suitable households you will receive a £10 Tesco voucher following the short appointment with our surveyor. The 150 customers we require will be allocated on a first come first served basis.

If you have any queries or would like further information please do not hesitate to call us on 0845 6010 147. We look forward to hearing from you and receiving your support.

Yours sincerely,

Handwritten signature of Jenny Abel in black ink.

Jenny Abel
Project Manager
Essex & Suffolk Water

Scheme approved by
Chelmer Housing Partnership

Handwritten signature of the Energy Officer in black ink.

Energy Officer

Appendix 5 – Telephone Script

Good morning / afternoon / evening.
I'm calling on behalf of Essex and Suffolk Water.

Did you receive the letter we sent regarding our current water efficiency project?

YES – We are carrying out a 20 minute survey of selected customers homes to see what we can do to improve water efficiency, its completely free of charge.

You will receive a £10 Tesco voucher for taking part and if you are selected for one of the water efficiency programmes you will be entered into a prize draw to win £100 cash or £20 Tesco vouchers.

We are in your area this week, can I book you in for an appointment?

Day ***** morning (9-12) or afternoon (12-5)

We can offer evening appointments on Thursday or Friday (5-8.30)

NO – There was a fridge magnet with a picture of a washing machine in with the letter?

If Still No:

We have a female technician who can conduct the surveys.

I Don't Use Much Water:

Your participation is still useful as it helps us know the best ways to encourage other people to follow your example.

We are not asking you to change you water use, but simply to provide you with more information so that you can make up your own mind.

We are not using this information for anything other than helping our customers to use water more wisely.

We are working with the housing association on this project

Thank the customer for their time, confirm appointment if one has been made and say good-bye.

Appendix 6 – Initial Survey Form

Essex & Suffolk Water
NW345: Sustainable Water Audits Research



Property ref _____
Date _____
Time _____
Customer name _____
Address _____
Phone number _____

Property Type

Detached Semi detached Bungalow Flat Terrace Other

Property Age

1-5 Years 6-20 Years 21-50 Years Over 50 Years

Number of people in each age group

Under 5 5-12 Years 12-18 Years Over 18 Years

Autumn 05 School 1/2 term date; _____

Is the customer prepared to have the audit during normal working hours (9am-5pm)?

Y/N Out of hours requested; details _____

How many of the following rooms?

Bedrooms Bathrooms Cloakrooms

How many of these services?

Sinks Baths Basins mixer taps Basins single taps

No. with diffuser insert

No with flow restrictor

No with isolating valve?

Is there an isolating valve for the following services?

Mains water Y/N Tank outlet Y/N Hot water cylinder Y/N

Toilet information

Location					
Concealed cistern - Y/N					
Cistern siphon or valve: 9, 7.5, 6 ltr					
Slimline - Y/N					
Dual flush?					
Handle or button?					
Flush: left, right, top, front, side					
cistern material - plastic, ceramic					
Is there an isolating valve?					

Shower information

Location					
Bath / Cubicle?					
Electric or gravity?					
Pumped					
Flow rate					
Mains or tank					
Combi boiler Y/N					
Chrome or plastic head?					
Is there an isolating valve?					

Garden

Is there a water butt? Y/N Is there room for another water butt? Y/N Is there a suitable plastic down pipe? Y/N

Is there a hose pipe? Y/N

Location of water meter _____ Serial no _____ Location of mains stop cock _____

Will the occupants be on holiday at any time before the end of November? Please give dates. _____

This is a true representation of the services at this property

Customer Signature _____ Engineers Signature _____

Appendix 7 – Education Form

Sustainable Audit Education

Property Reference Number _____

Date _____

Time _____

Part A – Your weekly water use

Water Activity	Estimate number of times per week	Average amount of water used	Total amount of water used each week
Taking a bath	X	65 litres	
Taking a shower	X Litres (30-50)	
Brushing teeth	X	3 Litres / min	
Flushing the toilet	X	9 litres	
Washing face / hands	X	9 litres	
Total			
Multiply by the number of people in your house			Part

Part B – Your household weekly water use

Water Activity	Estimate number of times per week	Average amount of water used	Total amount of water used each week
Drinking and cooking	X	10 litres	
Running the washing machine	X	70 litres per load	
Washing dishes by hand	X	10 litres	
Running the dishwasher	X	25 litres per load	
Watering the garden	X	500 litres per hour	
Washing the car	X	35 litres	
Part B Total			
Part A Total			
Household Total			

Average weekly water use

1000 litres = 1 cubic metre = 220 gallons	Number of people in household				
	1	2	3	4	5
Very High <ul style="list-style-type: none"> Frequent baths Heavy use of washing machine Daily use of dishwasher Extensive use of sprinkler or hosepipe 	2115	3269	4423	5000	5385
High <ul style="list-style-type: none"> Frequent baths/showers Regular use of washing machine Use of dishwasher Occasional use of hosepipe 	1346	2308	3269	3846	4423
Average <ul style="list-style-type: none"> Mixture baths/showers Prefer showers Regular use of washing machine No dishwasher No hosepipe 	961	1731	2500	2885	3269
Low <ul style="list-style-type: none"> Few/no baths Prefer showers Infrequent or no use of washing machine Little/no garden watering 	577	1346	1923	2500	2885

Customer Name _____

Water Saving Tips

Kitchen

Place a bowl in the sink to collect wasted water when running the tap, use to water garden or house plants

Wash veg in a bowl not under the tap

Use the minimum needed water in kettles or saucepans to save energy and water

Mend dripping taps as they can waste 26litres in 24hours

Make sure you use a full load in the washing machine or dish washer. Newer machines use less water. Using less powder means a shorter cycle can be used. 2 half loads use more water and energy.

Keep cold water in the fridge in the summer to avoid running off warm water.

Bathroom

Mend dripping taps

Fit a save a flush to toilet cisterns. New cistern since jan 2001 are <6l

Put tissues and cotton wool in the bin to prevent extra flushing

Use a beaker when cleaning your teeth.

A Shower which uses less than 10l per minute is water efficient. Power or massage showers use more.

Compare shower litres with a bath.

Outside

Use a bucket and sponge when washing the car rather than a hosepipe

Use a trigger gun on the end of the hosepipe to stop the water flow

Waterbutts fitted to drainpipes to collect rain water to use in the garden. Most plants prefer rain water.

Sprinklers are one of the biggest water users in the home

Burst pipes cause damage as well as wasting water. Ensure pipes are lagged for winter

Appendix 8 – Audit Costs

Ewan Group plc costs:

Activity	Database	Letters	Phone-calls	Site visits	Travel	Data input	Audit choice	Weekly reports	Meetings	Admin	Final report	Totals
All Audits	£2,222.00	£180.00	£171.00		£208.00		£247.50	£297.00	£528.00	£8,893.00	£13,700.00	£26,446.50*
Initial surveys			£135.00	£2,300.00	£329.00	£126.00				£540.00		£3,430.00*
Retrofit				£2,608.50		£80.00						£2,688.50
Full				£2,608.50		£80.00						£2,688.50
Self				£247.50	£110.80	£8.00						£366.30
Children's				£126.00	£82.00	£8.00						£216.00
One Off				£628.00	£109.40	£36.00						£773.40
Year Long				£628.00	£109.40	£36.00						£773.40
											Head office	£2,616.78
											Total	£39,999.38

* Overhead costs are £4979.41 ($£26446.50 + £3430.00 / 6 = £4979.41$)

ESW costs:

	Staff hrs/wk Worked	Staff Cost	Data Collection (hrs)	Data Collection Costs
May	51	694.6	0	0
June	29	300.45	0	0
July	29	300.45	0	0
Aug	28	276.1	0	0
Sept	19	89.05	21	210
Oct	19	89.05	21	210
Nov	17	273.7	21	210
Dec	17	273.7	21	210
Jan	6	28.35	21	210
Total	215	£2,325.45*	105	£1,050.00*

* These costs were added together, divided by the total number of audits (£562.57) and added to each of the individual audit costs.

Material costs:

Retro fit pack cost	Cost
Variflush device	£9.50
Ecoflush device	£7.50
Dudley Turbo 88 device	£14.23

Full Audit	Cost
Design of leaflet (per leaflet)	£4.00
Printing of leaflet (per leaflet)	£3.12
Save-a-flush	£0.64

Children Self audit	Cost
Audit pack	£2.59
Design of leaflet (per leaflet)	£8.00
Printing of leaflet (per leaflet)	£7.39

Self Audit	Cost
Audit pack	£2.59

Education audit	Cost
Save a flush	£0.64

Extra Information	Cost
Tea Towel	£1.12
Magnet	£0.12
Your Guide to Water Conservation	£0.14
Water Conscious Gardening	£0.09
How Water Wise can you be?	£0.12
Dry Garden Leaflet	£0.11
H2HoHo Leaflets	£0.45

Product	Price (each)	Quantity	Cost	Date Ordered
Water Butt Kits	£21.00	1,000	£21,000.00	24/06/2005

Appendix 9 – Large Scale Project Cost Estimates

Assumed Parameters:

10,000	Audits
30,000	Letters to be sent
23,100	Customers to be contacted by tel.
15,000	Initial Audits
12	No. of meetings
50	Duration of project (weeks)
50%	Audit Travel Savings (using local resource)
30%	Audit Efficiency Savings due to larger volume

Activity	Database	Letters	Phone-calls	Site visits	Travel	Data input	Audit choice	Progress reports	Meetings	Admin	Final report	Sub-Totals
Common Costs												
Consultancy												
General	£4,082.93	£6,136.36			£655.20			£1,299.38	£1,663.20	£12,968.96	£17,262.00	£44,068.02
ESW	Staff	Data Collection										
	£3,229.79											£3,229.79
												£47,297.81

Retrofit												
Consultancy												
Initial Surveys			£12,964.94	£154,618.90	£15,798.02	£12,100.61				£567.00		£196,049.47
Final Audit				£857,715.99	£151,361.64	£44,210.53						£1,053,288.16
Materials	Vari	Eco	Dudley									
	£24,700.00											
		£7,500.00	£75,419.00									£107,619.00
Common Costs												£47,297.81
												£1,404,254.44

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Full												
Consultancy												
Final Audit				£857,715.99	£151,361.64	£44,210.53						£1,053,288.16
Materials												
	Leaflet Design	Printing	Save-a-flush									
		£5,000.00	£6,400.00									£11,400.00
Common Costs												
												£47,297.81
											£1,111,985.97	

Self												
Consultancy												
Final Audit				£136,434.38	£43,627.50	£4,200.00						£184,261.88
Materials												
			Audit Pack									
			£25,900.00									£25,900.00
Common Costs												
												£47,297.81
											£257,459.69	

Childrens												
Consultancy												
Final Audit				£106,857.69	£49,673.08	£6,461.54						£162,992.31
Materials												
	Leaflet Design	Printing	Audit Pack									
			£25,900.00									£25,900.00
Common Costs												
												£47,297.81
											£236,190.12	

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One Off												
Consultancy												
Final Audit				£346,185.00	£43,076.25	£18,900.00						£408,161.25
Materials			Save-a-flush									
			£6,400.00									£6,400.00
Common Costs												£47,297.81
												£461,859.06

Year Long												
Consultancy												
Final Audit				£346,185.00	£43,076.25	£18,900.00						£408,161.25
Materials			Save-a-flush									
			£6,400.00									£6,400.00
Common Costs												£47,297.81
												£461,859.06

Assumptions:

Consultancy

Database

Increased Database cost by 75%

Letters

924 letters were sent, resulting in 189 (20%) agreeing to participate. To achieve 10,000 participation, pro-rata = 50,000 to be contacted!

Phone-calls - All Audits

With respect to the 924 customers, 160 customers had no tel available (17%), 56 called-in (6%), Ewan contacted 708 (77%).

Phone-calls - Initial Audits

164 initial audits were undertaken, assumed 30% saving due to larger number

Site Visits - Initial Audits

164 initial audits were undertaken, assumed 30% saving due to larger number

Site Visits - Audits

Assumed 30% saving due to larger number

Travel - All Audits

Attended 4 meetings during 9 months.

Travel - Initial Audits

Completed by Haywards Heath based resource, for larger project would recruit local staff, assume 50% reduction in cost

Progress Reports

3 originally produced, assumed for larger project 1 produced per month

Admin - All Audits

Original project duration 9 months

Admin - Initial Audits

Design of site form, therefore cost is unchanged

Final Report

Increased cost by 20%

Materials	Retro	Of 19 participants, 5 (26%) had the Variflush, 2 (10%) the Ecoflush, and 10 (53%) the Dudley
	Full	Assumed 100% of participants will receive a leaflet & save-a-flush
	Self	Assumed 100% of participants will receive audit pack
	Children	Leaflet design & printing included in Audit Pack. Assumed 100% of participants will receive a leaflet & audit pack
	One off	Assumed 100% of participants will receive save-a-flush
	Year Long	Assumed 100% of participants will receive save-a-flush
ESW		Prorata'd staff costs with respect to project timescale, no data collection costs
General		No extra information costs have been included

Appendix 10 – Customer Satisfaction Results

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Number of Customers	Was the information provided helpful?	Were you advised of the survey appointment?	Was the person who made the appointment polite?	Was the appointment kept?	Was the surveyor helpful and courteous?	Comments
1	Y	Y	Y	Y	Y	Suggested idea of a water Butt fitted to the down pipe from the roof - would be welcomed help for watering the garden.
2	Y	Y	Y	Y	Y	
3	Y	Y	Y	Y	Y	
4	Y	Y	Y	Y	Y	
5	Y	Y	Y	Y	Y	
6	Y	Y	Y	Y	Y	
7	Y	Y	Y	Y	Y	
8	Y	Y	Y	Y	Y	A leak was repaired out in the front garden. Mrs Fortey was told she was in debt on her payments of £7.25 a month, but had not been told to pay anymore. Please could we check whether she is in debt or credit.
9	Y	Y	Y	Y	Y	
10	Y	Y	Y	Y	Y	I think it would be a very good idea if all households were/put on a water meter, when they see how much they are using and what they have to pay it will help them to economise on their usage and at the same time help to conserve our resources.
11	Y	Y	Y	Y	Y	
12	Y	Y	Y	Y	Y	
13	Y	Y	Y	Y	Y	
14	Y	Y	Y	Y	Y	
15	Y	Y	Y	Y	Y	
16	Y	Y	Y	Y	Y	
17	Y	Y	Y	Y	Y	
18	Y	Y	Y	Y	Y	

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Number of Customers	Was the information provided helpful?	Were you advised of the survey appointment?	Was the person who made the appointment polite?	Was the appointment kept?	Was the surveyor helpful and courteous?	Comments
19	Y	Y	Y	Y	Y	The visit was interesting and informative.
20	Y	Y	Y	Y	Y	Well pleased and grateful.
21	Y	Y	Y	Y	Y	This was very informative, really everybody need to know how to save water.
22	Y	Y	Y	Y	Y	
23		Y	Y	Y	Y	
24	Y	Y	Y	Y	Y	Work was carried out - clean and efficient.
25	Y	Y	Y	Y	Y	They made no fuss. Did what they had to do and went.
26	Y	Y	Y	Y	Y	
27	Y	Y	Y	Y	Y	Very helpful. Polite.
28	Y	Y	Y	Y	Y	
29	Y	Y	Y	Y	Y	Loads of helpful information. Thank you.
30	Y	Y	Y	Y	Y	We are very pleased with your service. Brilliant. Thank you.
31	Y	Y	Y	Y	Y	
32	Y	Y	Y	Y	Y	
33	Y	Y	Y	Y	Y	Work done, good.
34	Y	Y	Y	Y	Y	
35	Y	Y	Y	Y	Y	Anything to help and save the use of water - must be helpful.
36	Y	Y	Y	Y	Y	The gentleman who came was most kind and helpful.
37	Y	Y	Y	Y	Y	Thank-you for the Water 21 efficiency programme. I have read all the information and I am pleased with the benefits and I am about to receive with the installation.
38	Y	Y	Y	Y	Y	
39	Y	Y	Y	Y	Y	
40	Y	Y	Y	Y	Y	You can't get any better than 5 ticks.

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Number of Customers	Was the information provided helpful?	Were you advised of the survey appointment?	Was the person who made the appointment polite?	Was the appointment kept?	Was the surveyor helpful and courteous?	Comments
41	Y	Y	Y	Y	Y	It would have been nice if the men would wipe their feet on the mat at the door and not my best rug!!
42	Y	Y	Y	Y	Y	Thank you very much.
43	Y	Y	Y	Y	Y	
44	Y	Y	Y	Y	Y	FOUND USEFUL: To find that I was using water wisely. I may now buy a washing up bowl and save even more water. And add another water butt to the other three to help out water over summer. Thanks.
45	Y	Y	Y	Y	Y	
46	Y	Y	Y	Y	Y	FOUND USEFUL: Information about showers. Crystals for garden. Children's information.
47	Y	Y	Y	Y	Y	
48	Y	Y	Y	Y	Y	
49	Y	Y	Y	Y	Y	
50	Y	N	Y	Y	Y	FOUND USEFUL: How much water was actually wasted.
Overall Satisfaction	98%	98%	100%	100%	100%	