



Final Report
SR21 Customer Preference Research to inform
Customer Priorities

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EXECUTIVE SUMMARY

Introduction

The present document reports on an investigation into customer preferences to inform customer priorities and is intended to inform Phase 2 of Scottish Water's overall customer engagement programme for SR21 ('Engage 21'). The overarching objective for the study was *to engage customers to make choices about service areas using a scalable "common measure" of preference for avoiding an adverse event by an individual.*

SW intend to use the (weighted) output of the research to create scalable customer priorities for the service areas of the gross benefit to customers for avoiding an expected annual number of adverse events (measured on a comparable basis). While the customer preferences can be reviewed intermittently to see if they change, they might be expected to remain fairly stable over time. In contrast, intervention to reduce the number of expected number of adverse events in specific service areas might lead to their prioritisation being reduced over time. Hence customer priorities might change more than customer preferences in the long term, with the latter providing valuable insight into customer choice and needs.

SW also intend to combine the outputs from this study with other information to provide high level guidance on investment priorities across service areas.

Survey Design and Development

Customer preferences were measured via a 'MaxDiff' choice exercise focussed on measuring the relative impact on customers of different types of service issue. This exercise included a sequence of 10 questions for each participant asking them to choose which service issue, from a set of four shown at a time, would have the most impact on them and which would have the least impact. Different sets of four service issues were shown across the sequence of choice situations put to a participant, and different sequences are distributed across the sample. The experimental design ensured that the exercise would be capable of measuring in quantitative terms an index of the relative impact sizes covering all service measures in the design.

In the survey as a whole, 30 service issues were evaluated in terms of their relative impact on customers if they were to occur.

Pre-testing of the survey instruments with SW's customers consisted of a cognitive and pilot phase. Following these phases, a report was produced which recommended a small number of changes to the survey instrument. The pilot report was peer reviewed by Prof. Ken Willis, a noted expert in the field of stated preference research and a small number of changes were made to the survey instrument before full implementation in the field.

Methodology

The main stage research with SW's customers consisted of the following approaches (with number of interviews undertaken shown):

- Household: 1,005 interviews
 - 905 online
 - 100 face to face
- Non-household: 400 telephone interviews

Findings

The key outputs from the models that we report are the sets of 'Impact scores' for households and non-households. The Impact score for a given service issue is the relative impact attributable to that service issue, on average for the corresponding customer population, in comparison to the baseline service issue which is assigned a value of 1.0. Thus, a value of 2.0 should be interpreted as indicating that the service issue in question has twice the impact, on average, of the baseline service issue.

The choice of which service issue to treat as the base case is arbitrary. The ratios between any two impact scores are independent of this choice of base case. For the purposes of our analysis, the baseline service issue was chosen to be 'You unexpectedly have no water for 3-6 hours'. This service issue therefore has an Impact score of 1.0, and all other Impact scores are to be interpreted in relation to this service issue.

Figure 9 shows the relative Impact scores for all water services for both households and non-households. Values for households are consistently higher than for non-households, which indicates that the benchmark "unexpected interruption of water supply (3h-6h)" has greater significance for non-households in comparison to all other water service attributes.

Service attributes for sewerage and environmental services are depicted in Figure 10 and Figure 11 respectively. As for water services, the Impact scores are consistently higher for households though there is minimal change in the rank order for sewerage services whereas for environmental services "moderate river water quality" ranks considerably lower in the non-household sample.

Figure 1: Impact scores - water service issues

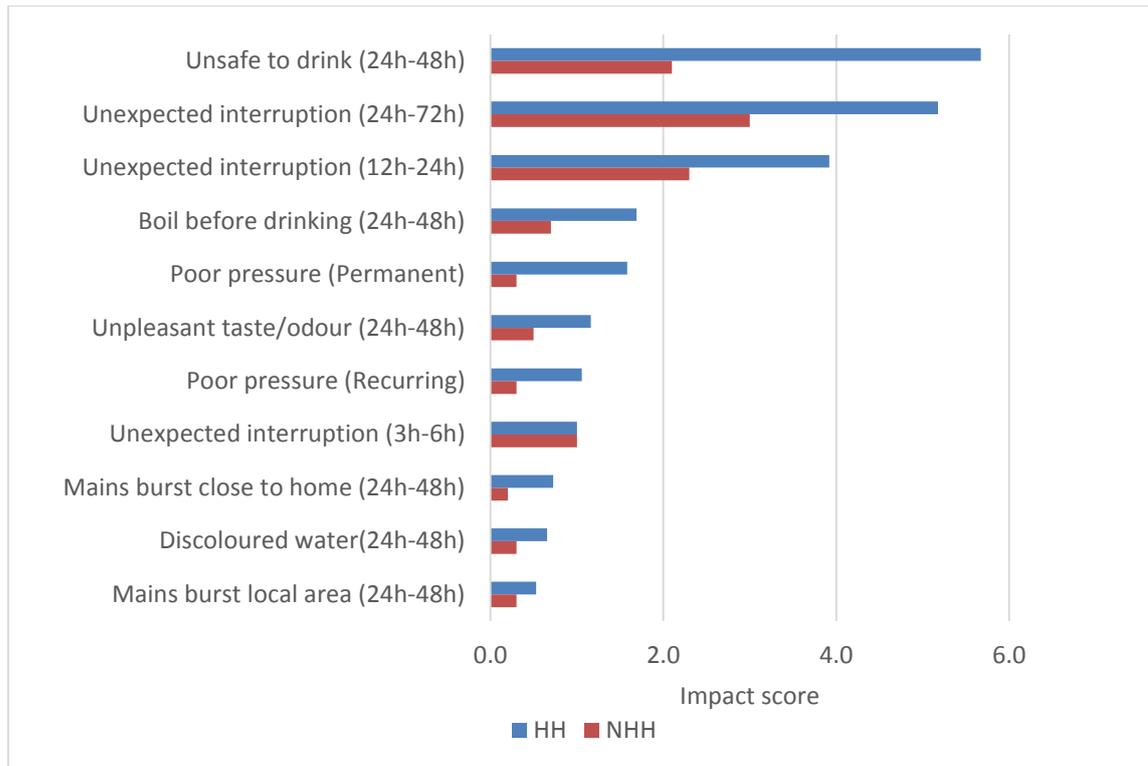


Figure 2: Impact scores - sewerage service issues

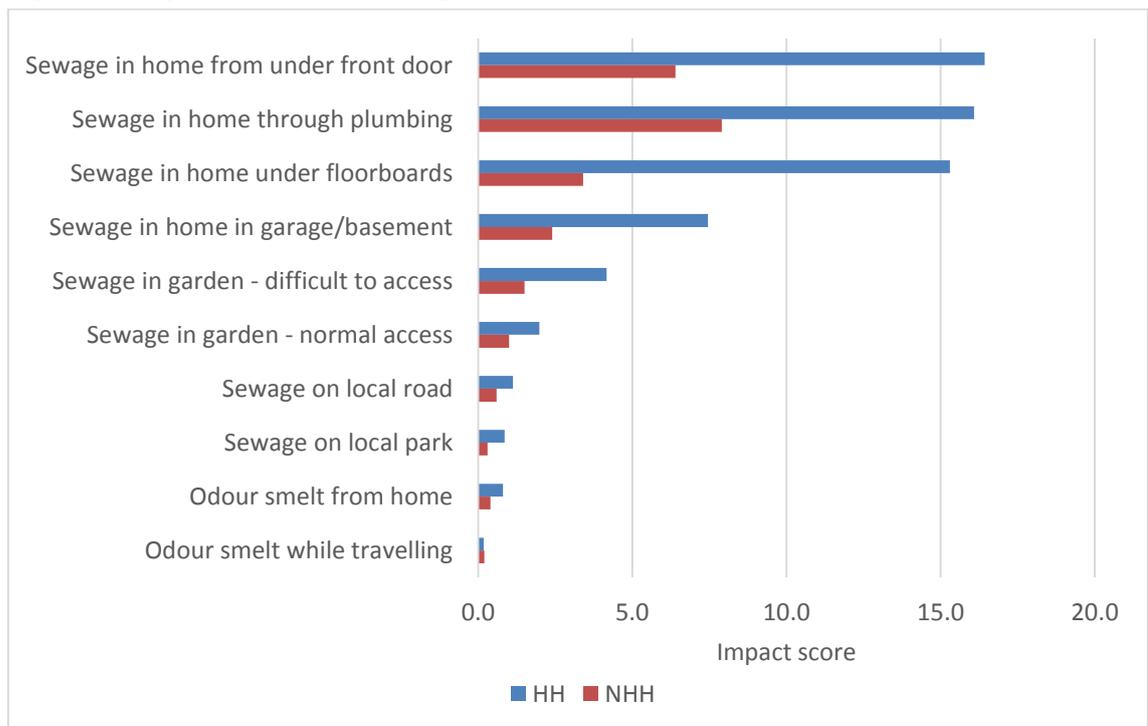
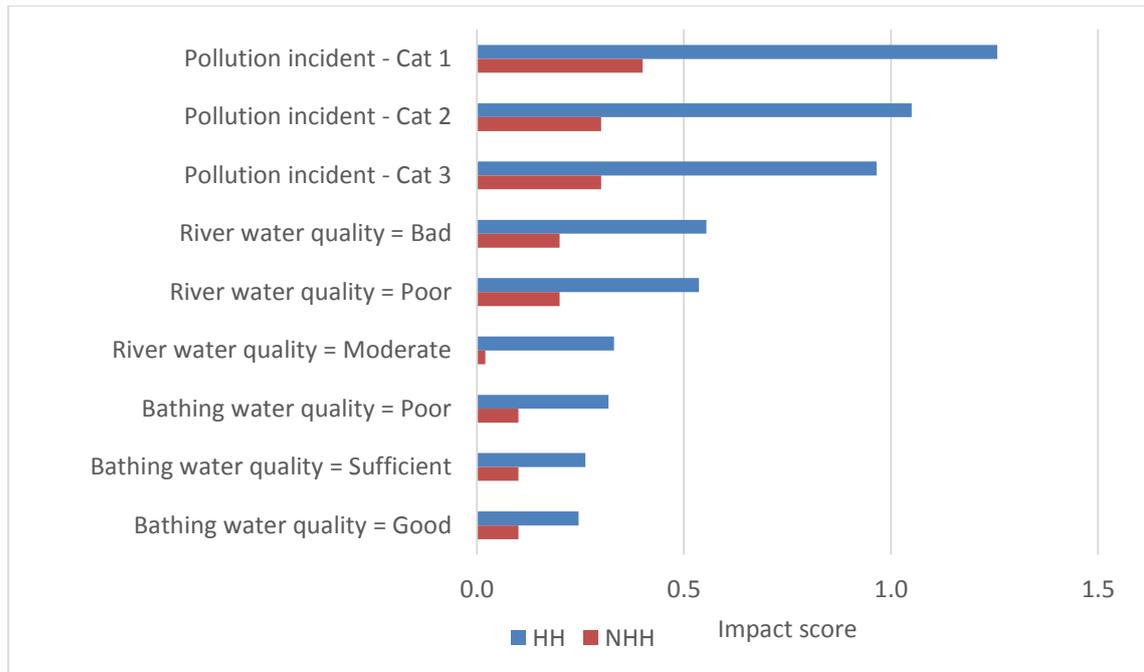


Figure 3: Impact scores - environmental issues



The results are intuitively reasonable, with higher Impact scores obtained for service issues that would be expected to have higher impacts. For example, longer duration interruptions had higher Impacts than shorter duration interruptions, and internal sewer flooding was found to have the highest Impact of all service issues.

Conclusions and Recommendations

The results reported here are supportive of the model’s suitability to detect and measure the relative impact of different water and sewerage service issues on customers.

The Impact estimates are not in themselves measures of customer or investment priorities, and should not be interpreted as being so. An economic approach requires that consideration be given to the number of customers that would be impacted by the service change and the cost of the service change, in addition to the impact that would be experienced by those affected. These calculations have not been undertaken, and were not part of the scope of the present study.

However, the present study has obtained estimates of relative impacts that can validly be used and combined with other information to inform customer and investment priorities. We therefore recommend them as such to Scottish Water for this purpose.

1. INTRODUCTION

1.1 Background

Scottish Water (SW) is Scotland's publicly owned water utility, answerable to the Scottish Government and the people of Scotland. It provides 1.34 billion litres of drinking water and takes away 847 million litres of waste water every day.

The company undertakes customer research on a continuous basis but wished to design an extensive Customer Engagement Programme to support its Strategic Review of Charges for 2021. The programme was to cover 4 distinct phases, each informing the next stage. The present document reports on an investigation into customer preferences and is intended to inform Phase 2 of the overall customer engagement programme.

SW previously carried out research to inform customer priorities in 2011 as part of the strategic work underpinning its investment plans for SR15 (2015-2021). In the period since 2011 SW has carried out a series of further research projects in order to continually develop its understanding of customer experience, perceptions and expectations.

The previous research covered a range of service areas including short term interruptions, drinking water quality, internal and external flooding, visible leakage, water quality -taste, water quality-odour, water quality-discolouration, low pressure and communication.

Based on this research SW developed an overview, based on urgency, of its main priorities for customers. The present research was commissioned to revisit the approach and inform a refresh of the customer priorities for investment.

1.2 Objectives

The overarching objective for the study was *to engage customers to make choices about service areas using a scalable "common measure" of preference.*

This common measure was to be defined collaboratively as part of the study and is discussed in section 2.

SW intend to use the (weighted) output of the research to create scalable customer priorities for the service areas of the gross benefit to customers of avoiding an expected annual number of adverse events (measured on a comparable basis). SW also intend to combine this with other information to provide guidance on investment priorities across the generic service areas.

1.3 Structure of the Report

This document summarises the survey instrument, our methodology and findings and conclusions from our analysis of the data. The remainder of this report is structured as follows. Section 2 describes the survey designs; Section 3 describes the methodology, including the size and characteristics of the achieved samples. Section 4 reports sample characteristics; Section 5 contains the findings; and Section 6 draws conclusions and recommendations. Questionnaires and show material for the household and non-household surveys are contained in Appendices A to D, while Appendix E contains an analysis of the variation in results across the household and non-household customer bases.

2. SURVEY DESIGN AND DEVELOPMENT

2.1 Service Areas

An initial set of service areas over which preferences were to be measured was provided to us by Scottish Water. This contained 30 different types of service issue, that affect individuals at connected properties, such as supply interruptions, water quality issues and internal sewer flooding, or in the environment close to or away from their connected properties, such as impacts on bathing water quality, river water quality and some external sewer flooding.

For each of the 30 service issues, a picture was either produced or provided by Scottish Water to illustrate the issue. The wording used to describe each issue was discussed with Scottish Water and refined via a series of collaborative iterations. Further refinements were made following the pre-testing phase of the survey instrument, described in 2.5 below.

The final set of service issues that were evaluated in the research are shown in Table 1 below.

Table 1: Service issues evaluated in research

You unexpectedly have no water for 3-6 hours
You unexpectedly have no water for 12-24 hours
You unexpectedly have no water for 24-72 hours
You find sewage in your home/workplace. It has come up through your plumbing (i.e. toilet or shower tray/wash basin).
You find sewage in your home/workplace. It is under your floorboards.
You find sewage in your home. It is located in your attached garage, basement or cellar./ It is located in storage/areas not used in your day to day working (e.g. basement or cellar)
You find sewage in your home/workplace. It is coming in from the outside under your front door.
You find sewage in your garden/outside of your workplace. You can get in and out of your house/workplace as normal.
You find sewage in your garden/workplace. This makes it difficult to get in and out of your house/workplace as normal.
You see sewage on a local road - cars have to move to the wrong side of the road to avoid it, or go through it.
You see sewage on part of your local park.
You see water coming out of the ground in your local area, but away from your home/place of work.
You see water coming out of the ground in a garden or path close to your home/place of work.
Your water has an unpleasant taste and/or odour. Your water company tells you it is safe to drink.
Your water is discoloured. Your water company tells you it is safe to drink.
You notice a pollution incident affecting more than a mile of a local waterway. This will include sewage debris and discolouration. There are around 100 dead fish over that distance and a smell of sewage.
You notice a pollution incident affecting less than half a mile of a local waterway. This will include sewage debris and discolouration. There are 10 -20 dead fish over that distance and a smell of sewage.
You notice a pollution incident affecting a small area of a local waterway. This will include sewage debris and discolouration. There are less than 10 dead fish over that distance and a smell of sewage.
You visit a beach which has been awarded zero out of three stars and a rating of 'Poor'. This rating is linked to the potential health impact of bathing in the water.
You visit a beach which has been awarded one out of three stars and a rating of 'Sufficient'. This rating is linked to the potential health impact of bathing in the water.

You visit a beach which has been awarded two out of three stars, and a rating of 'Good'. This rating is linked to the potential health impact of bathing in the water.
You notice unwanted algae growth on the water and virtually no normal plants, fish or wildlife on stretches of the local river and its banks. The water does not look natural nor suitable for contact activities (i.e. swimming, boating, fishing).
You notice limited diversity of fish and wildlife on stretches of the local river and its banks. The water looks unlikely to be suitable for contact activities (i.e. swimming, boating, fishing).
You are aware that the watercourse needs improvement to support wildlife and plants. The water does not appear too bad and looks likely to be suitable for contact activities (i.e. swimming, boating, fishing).
You have low water pressure in your home/workplace. This will affect how well your water appliances will work (showers, taps, washing machines etc.)/This will affect how well your water appliances and production processes will work (production lines, taps, or machinery which uses water etc.). This is a permanent problem.
You have low water pressure in your home/workplace. This will affect how well your water appliances will work (showers, taps, washing machines etc.)/This will affect how well your water appliances and production processes will work (production lines, taps, or machinery which uses water etc.). This is a recurring problem.
You can smell the odour from a waste water treatment works from your home/workplace.
You are travelling away from home/workplace by bus, train or car, and can smell the odour from a waste water treatment works as you go past.
Your tap water is not safe to drink, even after boiling. This means you have no access to safe drinking water at your home/place of work. You can use it to bathe and flush the toilet as normal but not for cooking or drinking at all.
Your tap water is not safe to drink, until you have boiled it. You can use it to bathe and flush the toilet as normal.

In order to clarify the timing of the service issues, respondents were told the following prior to being introduced to them:

'On very rare occasions there may be issues with your water and waste water services. This section is about various types of water and waste water service issues. In all cases, the problem will last 24-48 hours unless otherwise stated. We'll now look at each of these in a little more detail.'

This provided clarity and avoided the need to continually redefine the duration of impact between service areas within the survey – thereby simplifying the language. It enables the weights, applied after the survey to convert customer preferences to priorities, to take account of differences to the default duration of 24-48 hours used in the survey.

2.2 A Common Measure of Preference

The common measure with which to scale customer preferences was discussed extensively with Scottish Water, and a joint decision was reached to include two forms of question for cognitive testing in each interview, and to test which of them worked better as part of this process. Both were to assist those involved in the interview to consider what it would be like for them to be involved in a change to their service. The aim was that one measure only would be chosen to take forward to the pilot, and then main surveys following review of the cognitive interview data.

The following two measures were put forward for consideration.

- Ability to cope
- Impact

In principle service issues could be compared against each other on each of these two measures. Some in the cognitive test indicated that they would respond in a similar way under either wording; however, others thought that 'Impact' was less emotive and preferable when addressing environmental service areas. Following cognitive testing, as described in 2.5 below, the decision was made by Scottish Water to focus solely on the 'Impact' measure – that is, customers' views were to be explored by measuring the relative impact that each of the different types of service issue would have on them.

Specifically, the main choice questions were introduced with the following text:

*'For each question you will be asked to choose which of the four service issues would have the **most impact**, and which would have the **least impact** on you and your day-to-day life.'*

Some of the service issues shown would affect your own property whereas others would affect your local area. When comparing please consider how you would feel generally about the service issue happening, including any concerns you may have about your local area and the environment.'

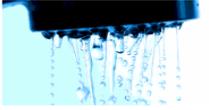
2.3 Questionnaire Design

To measure the relative impacts of different types of service issue, we applied the 'MaxDiff', or 'Best-Worst Scaling', design technique. This method involves showing respondents a sequence of questions each containing four different service issues, and asking them to state which would have the most impact on them and which would have the least impact on them.

An example MaxDiff choice card is found in Figure 4. The (i) icons shown in this figure were buttons that could be clicked to reveal more information about each of the service issues.

Figure 4: Example choice card from the MaxDiff exercise

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

 <p>You see sewage on part of your local park.</p> <p>i</p>	 <p>You find sewage in your home. It is located in your attached garage, basement or cellar.</p> <p>i</p>	 <p>You have low water pressure in your home. This will affect how well your water appliances will work (showers, taps, washing machines etc.). This is a recurring problem.</p> <p>i</p>	 <p>Your water has an unpleasant taste and/or odour. Your water company tells you it is safe to drink.</p> <p>i</p>
Most impact <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>			
Least impact <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>			

In comparison to rating scales, the MaxDiff method has the important advantage that it forces respondents to discriminate between the different alternatives rather than, as is often the case with rating scales, always choosing a high rating for all the service issues.

An alternative method which also requires respondents to compare and discriminate would be a question asking respondents to rank the full list in terms of impact. However, this type of question is very difficult for respondents to complete, whereas the MaxDiff questions are known to be much simpler. One important reason for this is that it is generally cognitively easier to identify the extremes, e.g. the best and worst, in any set, than it is to discriminate between middle-ranking members of the set.

The MaxDiff method can also be contrasted with the approach taken for the main SR15 customer priorities research. Previously, relative priorities were measured by asking customers to trade-off packages of service levels, where these were measured in terms of the risks of each type of service issue affecting them. Often these risk levels were very small and varied quite considerably across the different types of service issue examined. Customers, therefore, needed to be able to trade off small risks against one another as well as trade off how bad each issue would be for them if it were to affect them.

The new 'MaxDiff' exercise, by contrast, simply asked people to focus on the service issues themselves and decide which one, from a set of four shown at a time, would have the most impact on them and which would have the least impact. The principal advantage of the new 'MaxDiff' exercise is that it is much simpler for participants to answer than the previous research method. It is therefore expected to result in more

meaningful preference expressions and values. A further advantage is that more service issues could be evaluated robustly within a single survey design, thereby allowing all 30 service issues to be compared in the research whereas in the previous research only 13 service areas could be included.

It should be noted, however, that the outputs from the present research are not directly comparable with those from the SR15 research. This is because the SR15 research included monetary values and probabilities to obtain measures of willingness to pay for marginal improvements in service levels, whereas the focus of the SR21 research survey was on the relative impact of different types of service issue, with no consideration given to probabilities and willingness to pay for improvements.

2.4 Experimental Design

Participants were presented with repeated choice cards in which they had to choose the service measures that would have most and least impact on them out of a total of four presented to them of the kind shown in Figure 1.

The experimental design for this exercise, which determined which combinations were seen, was generated using an algorithm which sought to maximise the statistical precision of the estimates, whilst avoiding choice pairs where one option dominated the other one (e.g. two or more identical service issues, or two or more service issues of the same nature but different intensities such as supply interruptions of different durations).

A total of 300 choice cards were generated and grouped in 30 blocks of 10 cards each. Each participant was administered choice cards from a randomly selected block, hence answering 10 'MaxDiff' choice cards each.

2.5 Testing and Refinement

Cognitive Interviews

Fifteen cognitive depth interviews, ten with household customers and five with non-household customers, were undertaken with the purpose of informing the pilot and main stage of this research. The aims were, in particular:

- testing that participants were able to understand what was being asked
- ensuring the information given was sufficient for participants to feel they were able to provide an informed response
- testing different measures of preference, ie
 - Which of these service issues would you be **least able to cope with** and which would you be **most able to cope with**?
 - Which of these service issues would have the **most impact** and which would have the **least impact** on you?

All cognitive depth interviews were conducted using a computer-assisted telephone interviewing (CATI) method. Given the qualitative nature of the approach, fieldwork

was primarily undertaken Accent executives and a few by senior interviewers with extensive probing experience.

The results and the positive comments received were very encouraging from a survey design perspective. We were therefore jointly confident that the survey was understandable to customers across the different ages and social grades included in this phase of work.

The recommendations made following the cognitive testing phase were predominantly about the wording of questions/attributes, layout of the show cards and notes to be added to relevant briefing documents. For the pilot stage, we made all the minor changes to the relevant documents.

With regard to the choice between 'Impact' and 'Ability to cope' measures of preference, the results from the cognitive interviews were not conclusive either way as there are mixed views about each from the interviewees. Fortunately, no-one seemed to have a problem with either construction so we concluded that they would both be likely to work. Some in the cognitive test indicated that they would respond in a similar way under either wording; however, others thought that 'Impact' was less emotive and preferable when addressing environmental service areas. Following discussion of these results, Scottish Water decided to proceed with the 'Impact' measure for the pilot and main surveys.

Pilot Survey

A pilot survey was conducted with 50 household interviews and 50 non-household interviews. Household interviews were split by mode with 30 conducted online and 20 conducted face to face. Non-household interviews were conducted by telephone.

For the 'MaxDiff' exercise, good-fitting and plausible econometric models were estimated for households and non-households. However, counter-intuitive priorities were found with respect to Pollution incidents and Bathing water quality, wherein the order of Impact scores within these categories was not in line with expectation. Consequently, we discussed alternatives to the wording for these attributes to try and highlight the differing severities of each, and these changes were agreed with Scottish Water prior to the main survey.

Overall, the testing conducted on the survey instrument was supportive of its use in the main stage survey.

2.6 Peer Review

A noted expert in stated preference research, Professor Ken Willis, was engaged to act as peer reviewer for the study. Prof. Willis first informally reviewed the survey instrument prior to the cognitive testing phase, along with an explanatory note describing the context and purpose of the instrument. Prof. Willis then provided a formal review of the pilot report in which he concluded:

'The SR21 Customer Priorities Research pilot survey by Accent & PMJ Economics has been meticulously undertaken, and the data skilfully analysed. The pilot questionnaire, based on the MaxDiff methodology, has worked well, and has produced statistically significant estimates of customers' preferences for many service measure improvements. There is every expectation that, with a larger sample size in the main survey, most of the service measure attributes will be statistically significant, and that accurate, reliable, and robust estimates of customer preferences will be obtained along with impact scores for these attributes.'

On this basis, and following the minor amendments made in response to the cognitive and pilot test results, the survey proceeded to the main fieldwork stage.

3. METHODOLOGY

3.1 Survey Mode and Sample Sizes

The overall main stage sample consisted of 1,005 interviews with household and 400 interviews with non-household customers. The breakdown of achieved interviews by approach, survey mode and customer type for the reporting was as follows:

- **Household Interviews**
 - Online: 905 interviews
 - Face-to-face: 100 interviews
- **Non-Household Interviews**
 - Telephone: 400 interviews

3.2 Interview Length

The average interview length for the surveys is shown in Table 2 below.

Table 2: Average interview length

	Household Online	Household F2F	NHH CATI
Average interview length	12 minutes	25 minutes	17 minutes
Base	905	100	400

3.3 Sampling and Recruitment Method

The sample for the household interviews was provided by a panel partner of Accent's (online) and also recruited by Accent (F2F). The non-household sample was provided by a sample partner of Accent's.

Participants for the in-home face-to-face survey were recruited to the following minimum and maximum quotas for postcode areas (with urban or rural being specified):

	n
• EH rural (min 7 max 13)	8
• EH urban (min 7 max 13)	12
• KY rural (min 7 max 13)	10
• KY urban (min 7 max 13)	10
• PH rural (min 3 max 7)	7
• PH urban (min 3 max 7)	3
• ML rural (min 3 max 7)	3
• ML urban (min 3 max 7)	7
• G rural (min 12 max 17)	14
• G urban (min 12 max 17)	16
• AB rural (min 3 max 7)	10

The face-to-face sample was focused on including more vulnerable customers and those who are typically under-represented in online research.

The following minimum specifications were set:

- At least 10 x increased dependence on water
- At least 10 x people with learning difficulties (principally dyslexia or inability to write/use a key board)
- At least 10 x any other disability
- At least 10 x over age of 70 no internet access
- At least 10 x under age of 70 no internet access
- At least 20 x under £15,600 a year total household income
- At least 10 in households where English is not the first language

In addition, there were targets for those aged 16 to 34 in SEG C2DE and at least 40 DE and 40 C1C2 overall.

The household survey profile was guided by the 2011 Census of Population profile of household reference persons. This is the one person in each household responsible for making a census return. This was used as a proxy for bill payers who were the subject of this survey, although the targets were the persons solely or jointly responsible for household bills (see Table 3 and Table 4).

Table 3: Age and Social Class of Household Participants

Characteristic	Value	Target %	Target minimum %	Target maximum %	Actual %
Age	16 to 34	18	14	23	16
	35 to 49	29	22	36	25
	50 to 64	27	20	34	32
	65 and over	26	20	33	27
	Refused				1
	Total		100		
SEG under 65	AB	19	14	24	28
	C1C2	54	41	68	46
	DE	28	21	35	25
	Refused				1
	Total		100		

Base: all participants (1,005)

Table 4: Location of Household Participants

Area	Target %	Target minimum %	Target maximum %	Actual %
East Ayrshire / North Ayrshire / South Ayrshire	7	5	9	7
Scottish Borders	2	2	3	1
Clackmannanshire /Falkirk / Stirling	5	4	6	4
Dumfries & Galloway	3	2	4	3
Argyll & Bute / East Dunbartonshire / West Dunbartonshire	5	4	6	6
Fife	7	5	9	9
Aberdeen City / Aberdeenshire / Moray	10	8	13	11
Glasgow City	12	9	15	9
Highland / Eilean Siar	5	4	6	5
North Lanarkshire / South Lanarkshire	12	9	15	10
East Lothian / Edinburgh, City of/Midlothian / West Lothian	16	12	20	19
Orkney Islands / Shetland Islands	1	1	1	1
East Renfrewshire / Inverclyde / Renfrewshire	7	5	9	5
Angus / Dundee City / Perth & Kinross	8	6	10	10
Total	100			100

Base: all participants (1,005)

The non household sample profile was guided by the 2015 UK Business Survey for Scotland (see Table 5, Table 6 and Table 7).

Table 5: Size of Non Household Participants

Size (Employment)	Target %	Target minimum %	Target maximum %	Actual %
0-9 workers	88	66	100	74
10-49 workers	10	8	13	21
50-249 workers	2	1	2	4
250+ workers	0.4	0	1	1
	100			100

Base: all participants (400)

Table 6: Business Activity of Non Household Participants

Industry (SIC codes)	Target %	Target minimum %	Target maximum %	Actual %
Agriculture, forestry & fishing (A)	11	8	14	4
Mining, quarrying & utilities (B,D and E)				
Manufacturing (C)	16	12	20	15
Construction (F)				
Motor trades (Part G)	31	23	39	36
Wholesale (Part G)				
Retail (Part G)				
Transport & storage (inc postal) (H)				
Accommodation & food services (I)				
Information & communication (J)				
Financial & insurance (K)	31	23	39	26
Property (L)				
Professional, scientific & technical (M)				
Business administration & support services (N)	12	9	15	20
Public administration & defence (O)				
Education (P)				
Health (Q)				
Arts, entertainment, recreation & other services (R,S,T and U)				
	100			100

Base: all participants (400)

Table 7: Location of Non Household Participants

Area	Target %	Target minimum %	Target maximum %	Actual %
East Ayrshire / North Ayrshire / South Ayrshire	6	5	8	6
Scottish Borders	3	2	4	3
Clackmannanshire / Falkirk / Stirling	5	4	6	3
Dumfries & Galloway	4	3	5	5
Argyll & Bute / East Dunbartonshire / West Dunbartonshire	5	4	6	6
Fife	5	4	6	5
Aberdeen City / Aberdeenshire / Moray	15	11	19	12
Glasgow City	10	8	13	12
Highland / Eilean Siar	7	5	9	9
North Lanarkshire / South Lanarkshire	9	7	11	6
East Lothian / Edinburgh, City of / Midlothian / West Lothian	16	12	20	20
Orkney Islands / Shetland Islands	2	2	3	2
East Renfrewshire / Inverclyde / Renfrewshire	5	4	6	5
Angus / Dundee City / Perth & Kinross	8	6	10	7
Total	100			100

Base: all participants (400)

3.4 Fieldwork Dates for the Main Stage

The face-to-face household fieldwork took place between 12 and 19 June 2017.

Online household fieldwork took place between 1 and 19 June 2017.

Non household fieldwork was conducted between 31 May and 7 July 2017.

4. SAMPLE CHARACTERISTICS

4.1 Households

Demographics

The breakdown of household interviews by gender, age, SEG, location type and disability/reliance on water – and by survey type is shown in Table 8.

Table 8: Breakdown of household pilot interviews by key indicators

Characteristic	Value	Online %	F2F %
Gender	Male	37	50
	Female	63	12
Age	16 to 24	3	9
	25 to 34	11	22
	35 to 49	25	23
	50 to 64	33	22
	65 to 74	23	20
	75 or over	4	4
SEG	AB	30	11
	C1C2	47	38
	DE	22	51
Location	Urban - eg a town or city	69	53
	Rural - but within a 30 minute drive of a town or city	29	47
	Remote rural - >30 minute drive to a town or city	1	0
Disability/ reliance on water	No	83	57
	I have a disability	11	0
	Someone in household has a disability	7	0
	I have an increase reliance on water supply	1	11
	Someone in household has an increased reliance on water supply	1	6
	Learning disability	0	13
	Any other disability	0	19
Base		905	100

The breakdown of household interviews by location is shown below in Table 9. The face-to-face interviews with more vulnerable customers and those who are harder to get online were only sampled in some of the areas.

Table 9: Area by survey type

Area	Total %	Online %	F2F %
East Ayrshire/North Ayrshire/South Ayrshire	7	8	
Scottish Borders	1	2	
Clackmannanshire/Falkirk/Stirling	4	5	
Dumfries & Galloway	3	3	
Argyll & Bute/East Dunbartonshire/West Dunbartonshire	6	6	
Fife	9	8	20
Aberdeen City/Aberdeenshire/Moray	11	11	10
Glasgow City	9	8	20
Highland/Eilean Siar	5	5	2
North Lanarkshire/South Lanarkshire	10	9	20
East Lothian/Edinburgh, City of/Midlothian/West Lothian	19	18	20
Orkney Islands/Shetland Islands	1	1	
East Renfrewshire/Inverclyde/Renfrewshire	5	6	
Angus/Dundee City/Perth & Kinross	10	10	8
Base	1,005	905	100

The employment status for the household sample is shown in Table 10. Half the sample were employed and 28% retired.

Table 10: Employment status by survey type

Area	Total %	Online %	F2F %
Working full-time	37	38	31
Working part-time	13	12	16
Self-employed	1	1	2
Not working - looking for work	4	4	9
Not working - not looking for work	3	3	6
Full-time student	3	3	2
Part-time student	*	*	0
Retired	28	28	25
Retired unpaid voluntary work	2	2	0
Looking after family/home	5	5	5
Disabled/unable to work due to health	2	2	3
Carer	*	*	1
Other	*	*	0
Prefer not to say	1	1	0
Base	1,005	905	100

* = less than 0.5%

Key characteristics of more vulnerable customers and those who are harder to get online were only sampled in some of the areas are shown below in Table 11. Forty one per cent had no internet access only at home with access only, through a library or internet café.

Table 11: Vulnerable/less internet engaged customers – internet access

	%
At home on a laptop, PC, tablet or other mobile device via wifi/broadband	61
On the move using a mobile or tablet	38
At work	12
At a library or internet café	13
None of these - I don't use the internet	28
Base	100

About a half of this sample were on low incomes, defined as up to £300 per week/under £15,600 per year. Twelve per cent did not answer (see Table 12).

Table 12: Vulnerable/less internet engaged customers – low income

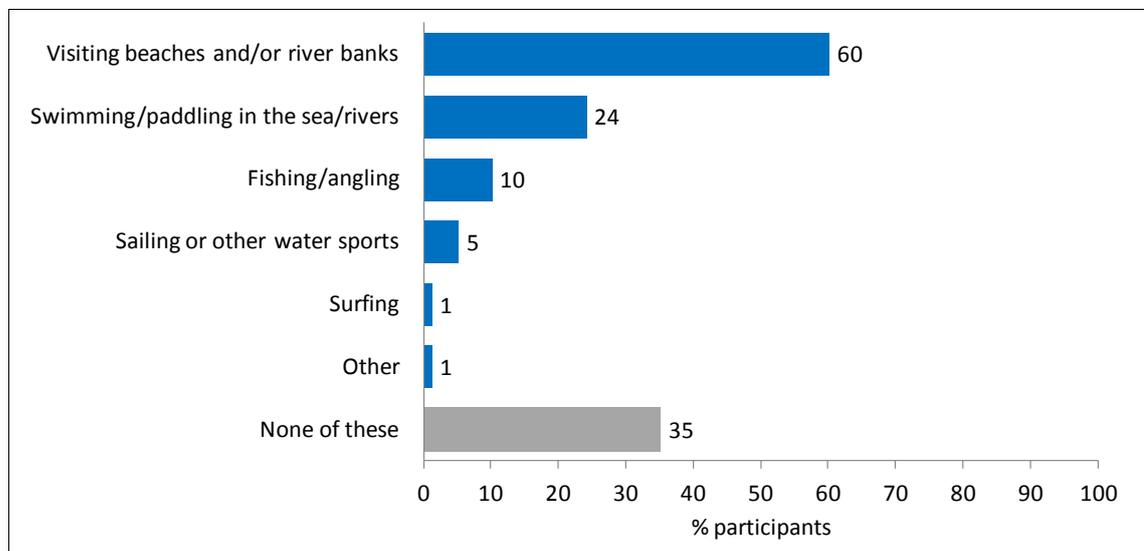
	%
Up to £300 per week/Under £15,600 per year	49
Over £300 per week/Over £15,600	39
Prefer not to say	12
Base	100

Leisure Time Spent Around Rivers and Beaches

Household participants were informed that “Together with other organisations, Scottish Water is responsible for the quality of river and coastal bathing waters”. They were then asked whether they spent any of their leisure time in or around rivers or beaches.

Overall, 65% spent some leisure time in or around rivers or beaches, with most of them (60%) visiting beaches and/or river banks. Twenty four per cent swam or paddled in the sea or rivers and 10% fished (see Figure 5).

Figure 5: Leisure time spent around rivers and beaches



Base: 1,005 household customers

Analysis by sample type is shown in Table 13 .

Table 13: Leisure time spent around rivers and beaches by sample type

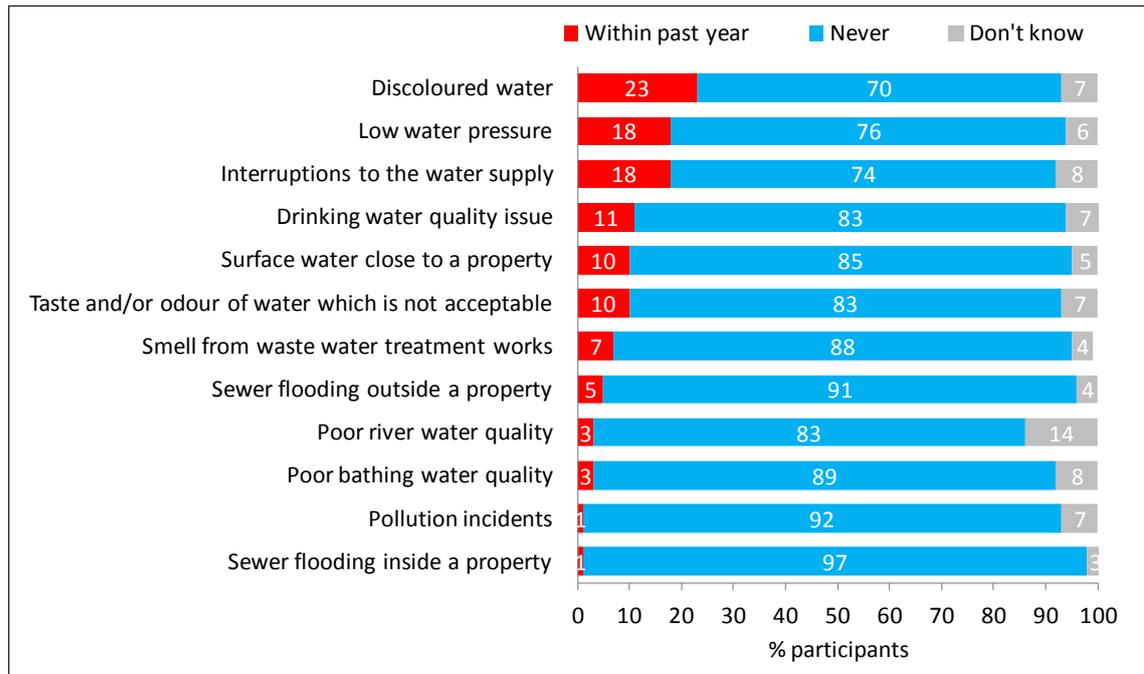
Area	Total %	Online %	F2F %
Visiting beaches and/or river banks	60	59	69
Swimming/paddling in the sea/rivers	24	25	16
Fishing/angling	10	10	9
Sailing or other water sports	5	5	3
Surfing	1	1	0
Other	1	1	2
None of these	35	36	29
Base	1,005	905	100

Experience of Problems

Participants were asked whether, to their knowledge, they or any of their relatives or friends had experienced any problems in Scotland within the past year of the kind shown to them in a list.

Figure 6 shows the problems experienced for the household sample. The most prevalent were discoloured water (23%), low water pressure (18%) and interruptions to water supply (18%). Although low water pressure was prevalent in the thoughts of those interviewed, SW noted that it involves significantly fewer contacts and number of affected properties (with pressure permanently below the minimum standards) than discoloured water and supply interruptions. This suggests that participants may have had a different idea of what constitutes low pressure than the definitions used by Scottish Water.

Figure 6: Experience of problems



Base: 1,005 household customers

Experiences of discoloured water in the last year were significantly higher in East Ayrshire/North Ayrshire/South Ayrshire (32%), North Lanarkshire/South Lanarkshire (37%) and East Renfrewshire/Inverclyde/Renfrewshire (42%), than in Aberdeen City/Aberdeenshire/Moray (15%) or Glasgow (10%)

4.2 Non-Households

A breakdown of non-household interviews by bill size, annual water consumption, number of sites operated from, number of employees, business sector and water meter status is provided in Table 14.

Table 14: Breakdown of non-household pilot interviews

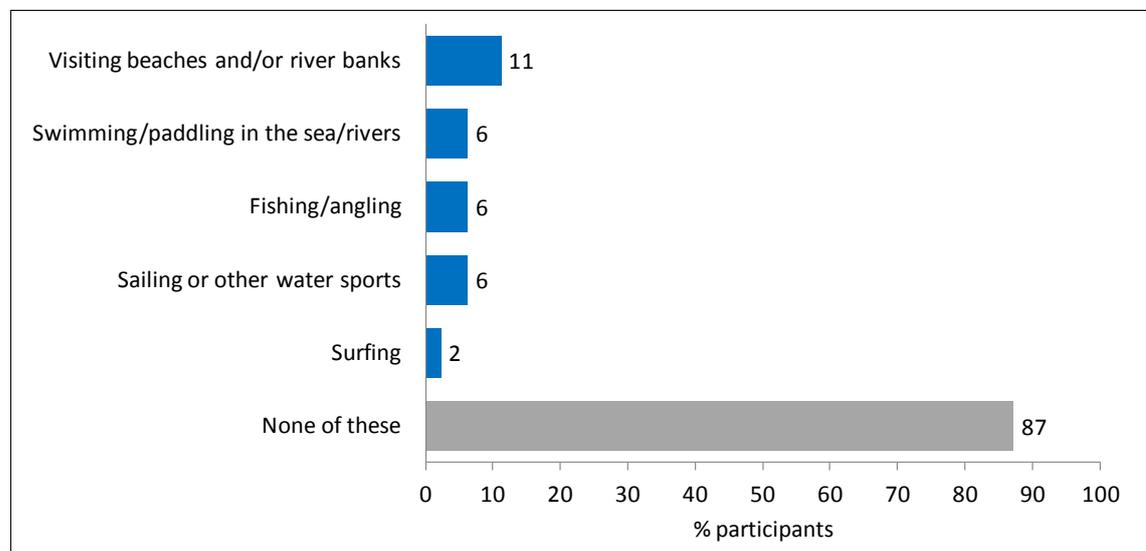
Characteristic	Value	%
Gender	Male	49
	Female	51
Size of bill	SMALL (Bill <£1,000 pa)	43
	MEDIUM (Bill £1,000-£19,999 pa)	31
	LARGE (Bill £20,000+ pa)	5
	Don't know	21
Location	Urban - eg a town or city	74
	Rural - but within a 30 minute drive of a town or city	22
	Remote rural - more than a 30 minute drive to a town or city	4
Dependent on water supply	Yes	46
	No	54
Number of sites in Scotland	1	70
	2	11
	3	3
	4+	17
Total		400

Business Activities/Income Related to Rivers and Beaches

Non-household participants were informed that “Together with other organisations, Scottish Water is responsible for the quality of river and coastal bathing waters”. They were then asked whether any of their business activity or income is related to activities in or around rivers or beaches.

Overall, 87% said none of their business activity or income was related to activities in or around rivers or beaches (see Figure 7).

Figure 7: Business activity or income related to activities in or around rivers or beaches



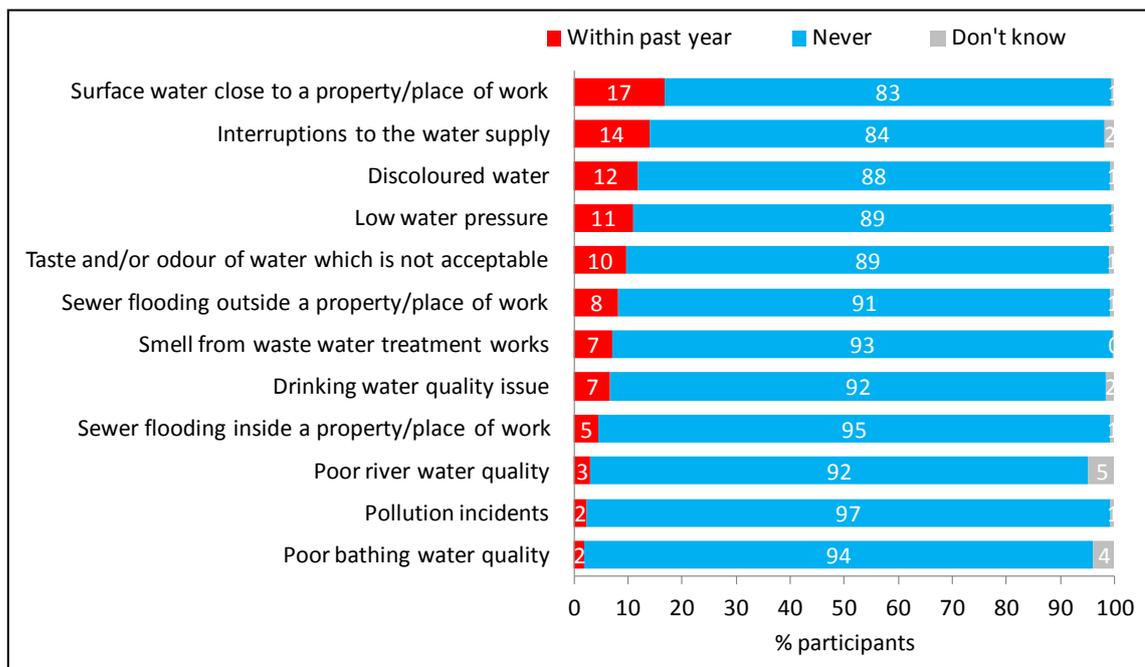
Base: 400 non-household customers

Experience of Problems

Non-household participants were asked whether, to their knowledge, their business or any other businesses or organisations they know had experienced any problems in Scotland within the past year of the kind shown to them.

Figure 8 shows the problems experienced for the non-household sample. The most prevalent were surface water close to a property/place of work (17%), interruptions to water supply (14%) and discoloured water (12%).

Figure 8: Experience of problems



Base: 400 non-household customers

The manufacturing and construction sector reported a significantly higher incidence of lower water pressure in the past year than did the financial and professional services sector (22% vs 7%).

More non-household customers who are dependent on their water supply experienced surface water close to a property or place of work than those not dependent on water (21% vs 13%).

5. FINDINGS

5.1 Impact Scores

The choice data from the MaxDiff exercise were analysed using rank-ordered logit models. These are econometric models designed to estimate the relative impact of each service issue, on average, for the populations of household customers and non-household customers.

The key outputs from the models that we report are the sets of 'Impact' scores for households and non-households. The Impact score for a given service issue is the relative impact attributable to that service issue, on average for the corresponding customer population, in comparison to the baseline service issue which is assigned a value of 1.0. Thus, a value of 2.0 can be interpreted as indicating that the service issue in question has twice the impact, on average, of the baseline service issue.

The choice of which service issue to treat as the base case is arbitrary. The ratios between any two impact scores are independent of this choice of base case. For the purposes of our analysis, the baseline service issue was chosen to be 'You unexpectedly have no water for 3-6 hours'. This service issue therefore has an Impact score of 1.0, and all other Impact scores are to be interpreted in relation to this service issue.

Household Impact Scores

Table 15 presents our main results for households. The results show the following.

Interruptions to supply

As anticipated, the perceived impact of a temporary interruption of water supply depended heavily on the duration of the disruption. An interruption lasting between 24 and 78 hours entailed a more than 30% stronger impact than an interruption lasting between 12 hours and 24 hours.

Sewer flooding

Incidents of internal sewer flooding exhibited by far the highest Impact scores of all the service issues. Independently from the source of the flooding (pipework or below floorboard, for instance), any case of sewer flooding within the living area entailed a more than 3 times higher impact than an interruption of water supply that lasts up to 78 hours. As anticipated, the impact of sewer flooding decreased considerably if the incident was said to take place outside the living area such as in an attached garage or basement.

Consistent with the above, the impact of outdoor sewer flooding was significantly lower than that of indoor flooding and declined with increased distance from the property. In comparison, the average Impact score measured across all four outdoor flooding scenarios was smaller than a 12-24 hour interruption of the water supply.

Surface water close to your property

The Impact score of outdoor leaks and water mains bursts was greater when closer to the home, as expected, but overall the impacts were less than a 3-6 interruption of water supply.

Unpleasant taste and odour and discoloured water

The Impact of unpleasant taste and odour was found to be higher than the impact of discoloured water.

Pollution incidents

As expected, the highest Impact was found for the most severe case of water pollution (category 1). No significant difference was found between category 2 and category 3 pollution incidents.

Bathing water quality

The Impact scores for the three bathing water quality levels differed only marginally. However, a bathing water achieving 'Good' status had a marginally lower impact on households than Sufficient and Poor status levels, as expected.

River water quality

Differences between bad, poor and moderate river quality were in the expected order of impact.

Low water pressure

The Impact score of permanent low pressure was higher than that for reoccurring low water pressure, as expected.

Smell from waste water treatment works

As expected, smell from waste water treatment works had a higher impact when experienced from home than when experienced when travelling. Both Impact scores were below that of a 3-6 hours interruption of water supply.

Drinking water quality

As anticipated, the Impact score for households was much smaller when told they could boil their water to make it safe rather than if this option was not available.

Table 15: Impact scores - Households

Variable	Impact score
You unexpectedly have no water for 3-6 hours	1.0
You unexpectedly have no water for 12-24 hours	3.9 ***
You unexpectedly have no water for 24-72 hours	5.2 ***
You find sewage in your home. It has come up through your plumbing	16.1 ***
You find sewage in your home. It is under your floorboards	15.3 ***
You find sewage in your home. It is located in your attached garage, basement or cellar	7.5 ***
You find sewage in your home. It is coming in from the outside under your front door	16.4 ***
You find sewage in your garden. You can get in and out of your house as normal	2.0 ***
You find sewage in your garden. This makes it difficult to get in and out of your house as normal	4.2 ***
You see sewage on a local road - cars have to move to the wrong side of the road to avoid it, or go through it	1.1 *
You see sewage on part of your local park	0.9
You see water coming out of the ground in your local area, but away from your home	0.5 ***
You see water coming out of the ground in a garden or path close to your home	0.7 ***
Your water has an unpleasant taste & odour. Your water company tells you it is safe to drink	1.2 ***
Your water is discoloured. Your water company tells you it is safe to drink	0.7 ***
You notice a visible impact on a local waterway including sewage debris and discolouration over a distance of more than a mile. There are more than 100 dead fish over that distance and a smell of sewage	1.3 ***
You notice a visible impact on a local waterway including sewage debris and discolouration over a distance of less than a mile. There are 10 to 100 dead fish over that distance and a smell of sewage	1.0
You notice a visible impact on a small part of a local waterway including visible sewage debris. There are 1 to 10 dead fish in that location and a smell of sewage	1.0
Your local beach is displaying the following sign: <POOR BWQ>	0.3 ***
Your local beach is displaying the following sign: <SUFFICIENT BWQ>	0.3 ***
Your local beach is displaying the following sign: <GOOD BWQ>	0.2 ***
You notice unwanted algae growth on the water and virtually no normal plants, fish or wildlife on stretches of the local river and its banks. The water does not look natural nor suitable for contact activities (i.e. swimming, boating, fishing)	0.6 ***
You notice limited diversity of fish and wildlife on stretches of the local river and its banks. The water looks unlikely to be suitable for contact activities (i.e. swimming, boating, fishing)	0.5 ***
You are aware that the watercourse needs improvement to support wildlife and plants. The water does not appear too bad and looks likely to be suitable for contact activities (i.e. swimming, boating, fishing)	0.3 ***
You have low water pressure in your home. This will affect how well your water appliances will work (showers, taps, washing machines etc.). This is a permanent problem	1.6 ***
You have low water pressure in your home. This will affect how well your water appliances will work (showers, taps, washing machines etc.). This is a recurring problem	1.1
You can smell the odour from a waste water treatment works from your home	0.8 ***
You are travelling away from home by bus, train or car, and can smell the odour from a waste water treatment works as you go past	0.2 ***
Your water company tells you that your water is not safe to drink, even after boiling. You can use it to bathe and flush the toilet as normal	5.7 ***
Your water company tells you that your water must be boiled before drinking to make it safe. You can use it to bathe and flush the toilet as normal	1.7 ***

* significant at 10%; ** significant at 5%; *** significant at 1%. Number of Pseudo R²: 0.296

Table 16: Impact scores - Non-households

Variable	Impact score
You unexpectedly have no water for 3-6 hours	1.0
You unexpectedly have no water for 12-24 hours	2.3 ***
You unexpectedly have no water for 24-72 hours	3.0 ***
You find sewage in your home. It has come up through your plumbing	7.9 ***
You find sewage in your home. It is under your floorboards	3.4 ***
You find sewage in your home. It is located in your attached garage, basement or cellar	2.4 ***
You find sewage in your home. It is coming in from the outside under your front door	6.4 ***
You find sewage in your garden. You can get in and out of your house as normal	1.0
You find sewage in your garden. This makes it difficult to get in and out of your house as normal	1.5 ***
You see sewage on a local road - cars have to move to the wrong side of the road to avoid it, or go through it	0.6 ***
You see sewage on part of your local park	0.3 ***
You see water coming out of the ground in your local area, but away from your home	0.3 ***
You see water coming out of the ground in a garden or path close to your home	0.2 ***
Your water has an unpleasant taste & odour. Your water company tells you it is safe to drink	0.5 ***
Your water is discoloured. Your water company tells you it is safe to drink	0.3 ***
You notice a visible impact on a local waterway including sewage debris and discolouration over a distance of more than a mile. There are more than 100 dead fish over that distance and a smell of sewage	0.4 ***
You notice a visible impact on a local waterway including sewage debris and discolouration over a distance of less than a mile. There are 10 to 100 dead fish over that distance and a smell of sewage	0.3 ***
You notice a visible impact on a small part of a local waterway including visible sewage debris. There are 1 to 10 dead fish in that location and a smell of sewage	0.3 ***
Your local beach is displaying the following sign: <POOR>	0.1 ***
Your local beach is displaying the following sign: <SUFFICIENT>	0.1 ***
Your local beach is displaying the following sign: <GOOD>	0.1 ***
You notice unwanted algae growth on the water and virtually no normal plants, fish or wildlife on stretches of the local river and its banks. The water does not look natural nor suitable for contact activities (i.e. swimming, boating, fishing)	0.2 ***
You notice limited diversity of fish and wildlife on stretches of the local river and its banks. The water looks unlikely to be suitable for contact activities (i.e. swimming, boating, fishing)	0.2 ***
You are aware that the watercourse needs improvement to support wildlife and plants. The water does not appear too bad and looks likely to be suitable for contact activities (i.e. swimming, boating, fishing)	0.2 ***
You have low water pressure in your home. This will affect how well your water appliances will work (showers, taps, washing machines etc.). This is a permanent problem	0.3 ***
You have low water pressure in your home. This will affect how well your water appliances will work (showers, taps, washing machines etc.). This is a recurring problem	0.3 ***
You can smell the odour from a waste water treatment works from your home	0.4 ***
You are travelling away from home by bus, train or car, and can smell the odour from a waste water treatment works as you go past	0.2 ***
Your water company tells you that your water is not safe to drink, even after boiling. You can use it to bathe and flush the toilet as normal	2.1 ***
Your water company tells you that your water must be boiled before drinking to make it safe. You can use it to bathe and flush the toilet as normal	0.7 ***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Pseudo R²: 0.321

Non-Household Impact Scores

Table 16 shows the corresponding Impact scores for non-households. Here, the results also seem intuitively reasonable with higher impact scores for service issues that one would expect to have greater impacts on customers. For example, longer interruptions had higher impact scores than shorter interruptions, and the sewer flooding measures are found to have the highest Impact scores of all the service issues.

Overall, most values are smaller than in comparison to the household sample, which indicates that the benchmark service issue, a 3-6 hour interruption to supply, was considered to have a higher impact in the case of non-households than in the case of households. Correspondingly, service issues like internal sewer flooding, while still entailing the biggest impact, were found to have a smaller Impact score than for the household sample.

Comparison between Households and Non-Households across Water, Waste Water and Environment Service

Figure 9 shows the relative Impact scores for all water services for both households and non-households. Values for households are consistently higher than for non-households, which indicates that the benchmark “unexpected interruption of water supply (3h-6h)” has greater significance for non-households in comparison to all other water service attributes. This is also evidenced by the fact that all three levels of unexpected interruptions rank higher for non-households (1st, 2nd and 4th position from the top for “24h-72h”, “12h-24h” and “3h-6h” interruptions, respectively) than for households (2nd, 3rd and 8th position from the top).

Service attributes for sewerage and environmental services are depicted in Figure 10 and Figure 11 respectively. As for water services, the Impact scores are consistently higher for households though there is minimal change in the rank order for sewerage services whereas for environmental services “moderate river water quality” ranks considerably lower in the non-household sample.

Household and non-household Impact scores may be combined by Scottish Water using either customer numbers or total revenue as weights. Using numbers of households and non-households as weights would essentially treat each household and non-household as having equal weight for decision making purposes. By contrast, using total household and non-household revenue instead would give a higher weight to non-households due to their larger average bill size, and could be justified on this basis. Ultimately, the choice of which type of weights to use is a decision to be made by Scottish Water.

Figure 9: Impact scores - water service issues

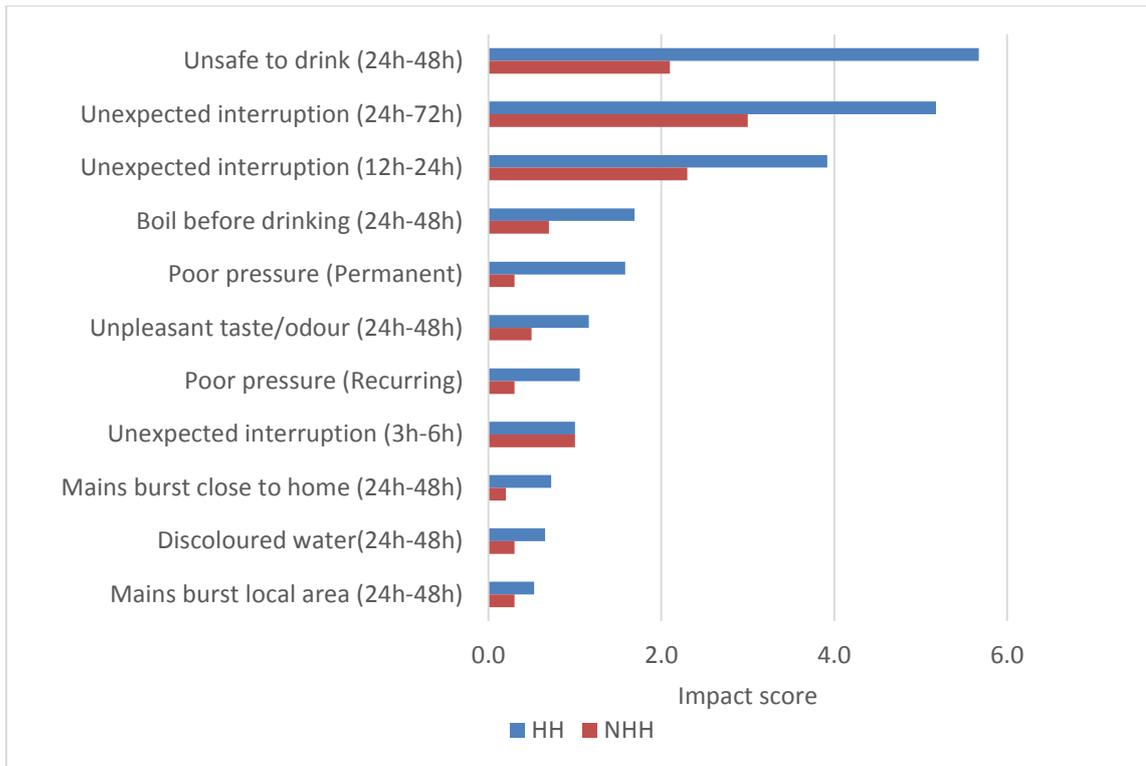


Figure 10: Impact scores - sewerage service issues

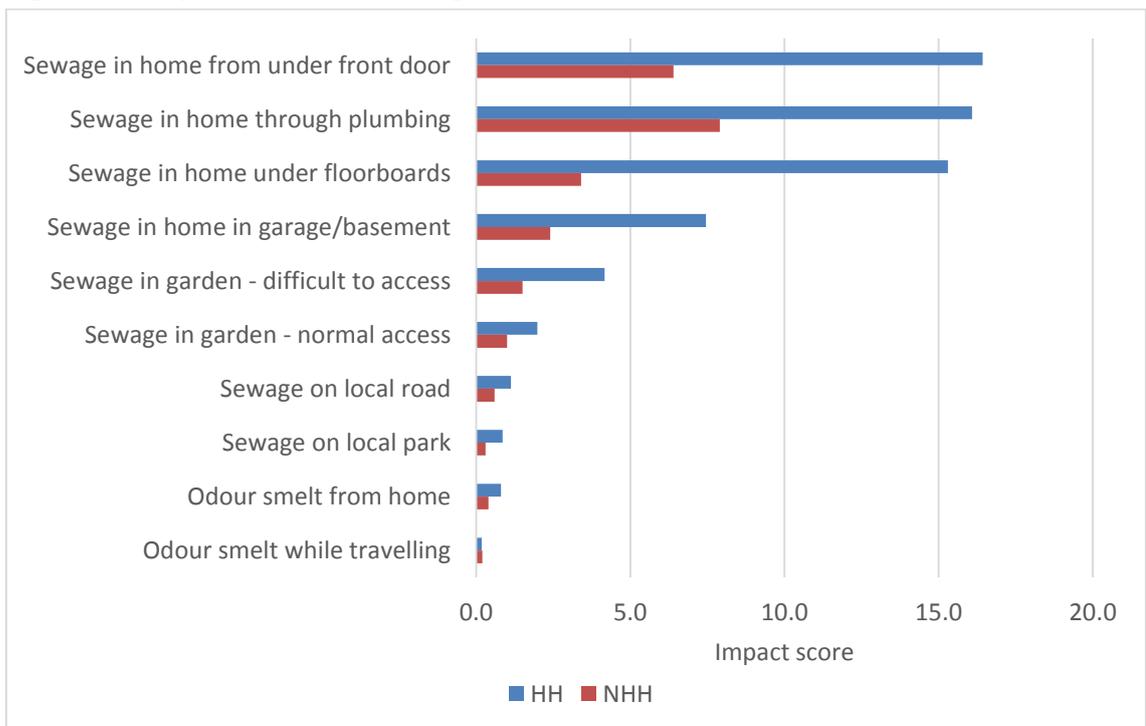
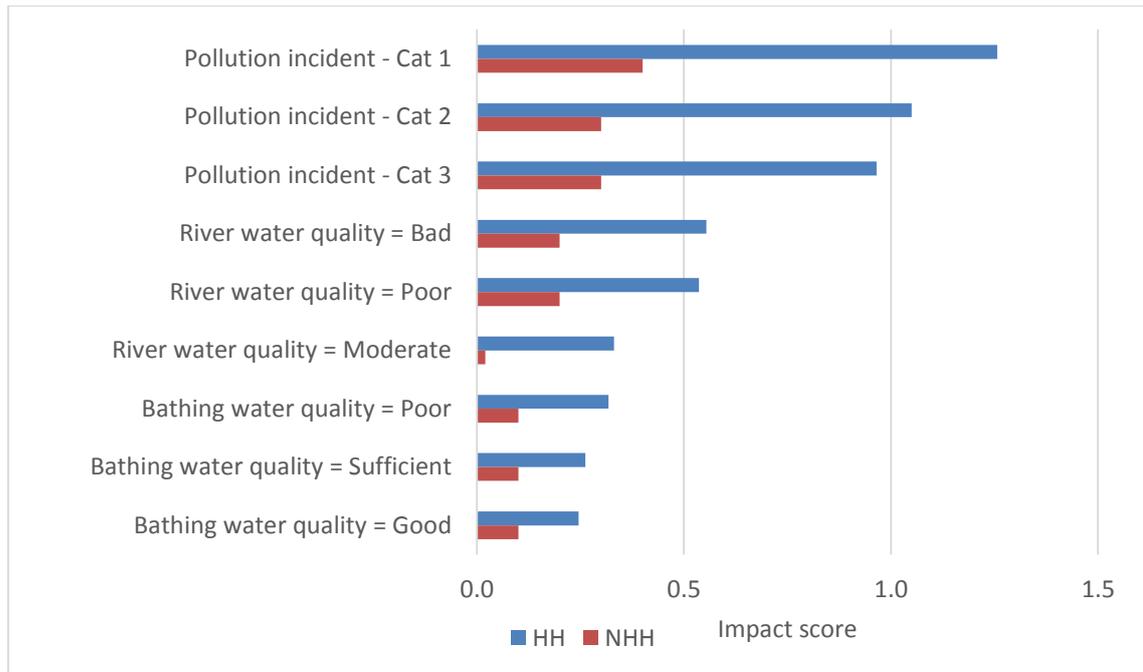


Figure 11: Impact scores - environmental issues



5.2 Application of the Results

The Impact scores presented in Table 15 and Table 16 are scalable measures of preferences for avoiding an adverse event by an individual. The Impact estimates are not in themselves measures of customer or investment priorities, and should not be interpreted as being so. An economic approach requires that consideration be given to the number of customers that would be impacted by the service change and the cost of the service change, in addition to the impact that would be experienced by those affected. These calculations have not been undertaken, and were not part of the scope of the present study.

SW intend to use the (weighted) output of the research to create scalable customer priorities for the service areas of the gross benefit to customers for avoiding an expected annual number of adverse events (measured on a comparable basis). The expected annual number of adverse events is a forward looking measure that can be informed by current annual run rates, customer contact information and forecasts that take account of the probability and scale of events. These can be measured on a comparable basis by reference to the equivalent number of affected properties.

While the customer preferences can be reviewed intermittently to see if they change, they might be expected to remain fairly stable over time. In contrast, intervention to reduce the number of expected number of adverse events in specific service areas might lead to their prioritisation being reduced over time. Hence customer priorities might change more than customer preferences in the long term, providing valuable insight into customer choice and needs.

SW also intend to combine this with other information to provide guidance on investment priorities across service areas. This might, for example, include more specific events within service areas from other information within SW to supplement those considered within the present survey review. It might also include an assessment of the relative unit costs of investment for changes in service areas to assess how the gross and net benefits for avoiding an adverse event compare. Hence this would take into account, in addition to the relative impacts reported here, the number of customers that would be affected by an investment in any related area, and the costs of those investments.

In many cases, a mapping will be required to translate units of improvement, as typically measured, into numbers of customers affected. For example, in the case of *'You can smell the odour from a waste water treatment works from your home'*, the evaluation of an investment should take into account the number of customers that would be affected by any reduction in odour from a given treatment works.

Similarly, for investments affecting river water quality, or pollution incidents into rivers, the appraisal should consider the number of customers 'local' to the river, or rivers, affected. This is because the MaxDiff exercise described these service issues as happening to the customer's local river, and so Impact scores are measured on this basis.

In summary, the Impact scores reported in Table 15 and Table 16 are not by themselves direct measures of customer support for investment in each area. Further analysis of the numbers of customers affected by any investment in the area, and the costs of that investment, would be necessary to undertake a valid economic approach to prioritisation using these results.

5.3 Segmentation Analysis

We have conducted an analysis of the variation of Impact scores across the household and non-household customer bases to support the main results reported above. Household segmentations include age, gender and SEG, area, zone, vulnerability and water related activities, non-household segmentations include area, zone, number of employees, number of branches, dependency on water supply, bill size and industry.

The segmentation analysis is reported in detail in Appendix E. In summary, we find a very large number of statistically significant differences across customer segments. In particular, there are wide variations in the Impact scores attributable to environmental service measures across segments. However, the order of Impact scores is much more stable, with every segment, for example, valuing internal sewer flooding issues the highest of all the service issues asked about.

The results reported in in Appendix E include statistical significance levels for comparisons across all the segments, and should provide a rich set of data for SW to see how preferences vary across its customer base.

5.4 Other Findings

What Scottish Water should concentrate on in the future

As a supplementary question prior to the main stated preference exercise, both household and non-household participants were given 30 seconds to name up to three things that Scottish Water should concentrate on in the future.

The online participants saw the following:



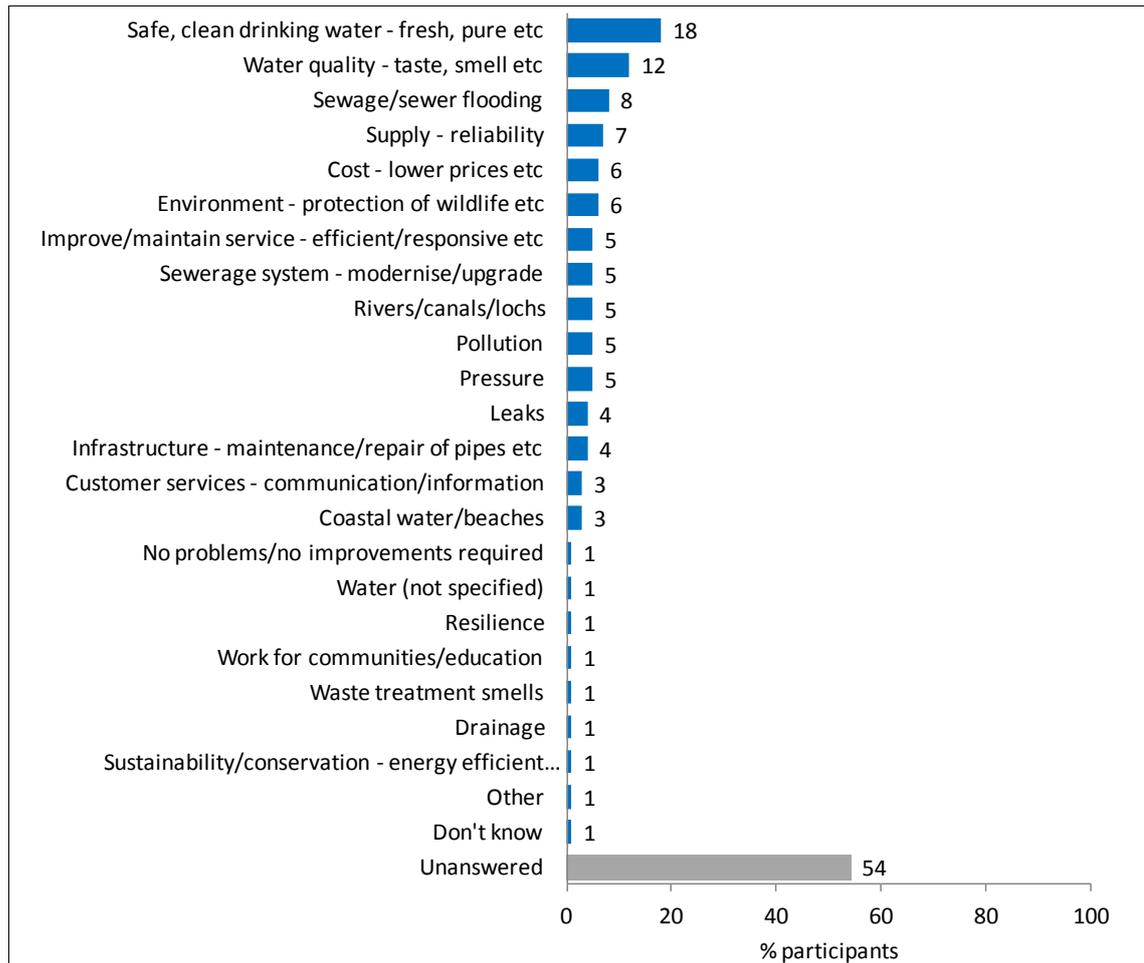
And were then shown a timer that counted down from 30 seconds.

Households

Fifty four per cent of households did not undertake the exercise at all, ie they did not enter anything into the box. For those who did respond 2.3 things were mentioned on average. The responses have been coded and listed into the responses shown in Figure 12. The main things mentioned were

- Safe, clean drinking water - fresh, pure etc (18%)
- Water quality - taste, smell etc (12%)
- Sewage/sewer flooding (8%)

Figure 12: Three things that Scottish Water should concentrate on in the future



Base: 1,005 household customers

There were some significant variations in perceptions about concentrating on safe, clean drinking water in the future. It was mentioned more by rural residents, younger people and people in lower social classes:

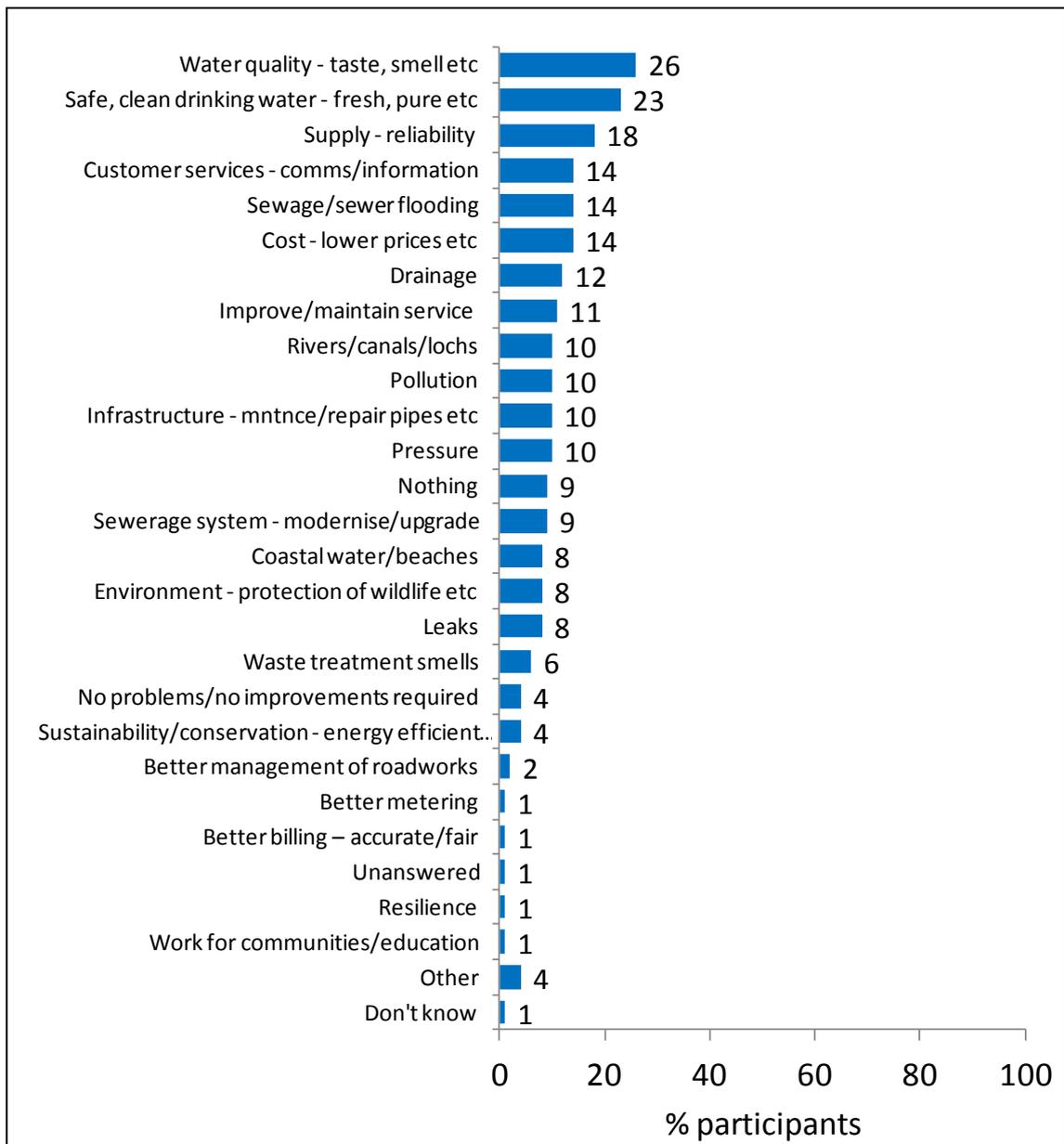
- More in social class DE (29%) than in social class AB (12%) or C1C2 (18%)
- More younger people aged 16 to 34 (24%) than people aged 65 or older (18%)
- More in rural/remote rural areas (24%) than in urban areas (16%).

Non-Households

For non-households, the responses are listed into the categories shown in Figure 13. The main things mentioned were:

- Water quality - taste, smell etc (26%)
- Safe, clean drinking water - fresh, pure etc (23%)
- Supply reliability (18%)

Figure 13: Three things that Scottish Water should concentrate on in the future



Base: 400 non-household customers

6. CONCLUSIONS AND RECOMMENDATIONS

The overarching objective for the study was *to engage customers to make choices about service areas using a scalable “common measure” of preference*. This common measure was defined collaboratively with Scottish Water, and based partly on cognitive interview testing, to be the impact that the service issue in question would have on the customer.

The survey was designed around a core ‘MaxDiff’ choice exercise which obtained data on the relative impacts of 30 different service issues in total. The data from this exercise were analysed using econometric models to obtain indices of relative impacts for households and non-households.

The results from the analysis were intuitively reasonable, with higher Impact scores obtained for service issues that would be expected to have higher impacts. For example, longer duration interruptions had higher impacts than shorter duration interruptions, and internal sewer flooding was found to have the highest impact of all service issues. The results are thus considered supportive of the model’s suitability to detect and measure the relative impact of different water and sewerage service issues on customers.

The impact estimates reported here are not in themselves measures of customer priorities, and should not be interpreted as being so. An economic approach also requires that consideration be given to the number of customers that would be impacted by the service change and the cost of the service change, as well as the impact that would be experienced by those affected. These calculations have not been undertaken, and were not part of the scope of the present study.

However, the present study has obtained estimates of relative impacts that can validly be used with other information to inform customer priorities and high level guidance for investment prioritisation. We therefore recommend them as such to Scottish Water for this purpose.

APPENDIX A

Household Questionnaire

SYSTEM INFORMATION:

Interviewer number

Interviewer name

Date:

Time interview started:

Introduction

CAPI: Good morning/afternoon/evening. My name is from Accent and I am carrying out research for Scottish Water to understand customers' priorities for water and sewerage services.

Can I just ask you a few questions to check that you are eligible to take part in this research?

Any answer you give will be treated in confidence in accordance with the Code of Conduct of the Market Research Society

ONLINE: Thank you very much for agreeing to complete this online survey which is being conducted by Accent. The closing date for completion of this survey is Thursday **15th June**.

We are carrying out research for Scottish Water to understand customers' priorities for water and sewerage services.

The research is being conducted under the terms of the MRS code of conduct and is completely confidential. If you would like to confirm Accent's credentials please call the MRS free on 0500 396999.

The questionnaire will take about 20 minutes to complete.

You do not have to answer questions you do not wish to and you can terminate the interview at any point. Once submitted you will not be able to enter again.

IF MOBILE DEVICE SHOW: This survey is best undertaken on a tablet or a PC. If you do use a smartphone you can switch between desktop mode and mobile mode at any time by clicking the button at the bottom of the screen.

Please use the  at the bottom of the page to go forward. As soon as you do this your answer is saved.

If you need to go back, please use the  button.

If you leave the survey idle for 30 minutes, you will be logged out but don't worry you can go straight back in to the point you left off by clicking on the link in the email we sent you

We will first ask you a couple of questions to check that you are eligible to take part in this research.

Scoping questions

Q1. HIDDEN QUESTION

1. Online
 2. CAPI
-

Q1A CAPI: INTERVIEWER SELECT TARGET AREA FOR YOUR INTERVIEWS

- EH rural (target 10, min 7 max 13)
 - EH urban (target 10, min 7 max 13)
 - KY rural (target 10, min 7 max 13)
 - KY urban (target 10, min 7 max 13)
 - PH rural (target 5, min 3 max 7)
 - PH urban (target 5, min 3 max 7)
 - ML rural (target 5, min 3 max 7)
 - ML urban (target 5, min 3 max 7)
 - G rural (target 15, min 12 max 17)
 - G urban (target 15, min 12 max 17)
 - AB rural(target 10, min 3 max 7)
-

Q2. Do you or any of your close family work or have any of you worked in either market research or in the water industry (including working for Scottish Water)? **ONLINE PLEASE CLICK ON ONE OF THE ANSWERS BELOW.**

- Yes **THANK & CLOSE**
 - No
-

Q3. Can you please confirm that you are responsible – either solely or jointly – for your household bills? Your water and waste/sewerage bill is included as part of your council tax bill. **SINGLE CODE**

1. Yes
 2. No **THANK & CLOSE**
-

Q4. Where do you live? If you live in more than one place, select the country you mainly live in. **SINGLE CODE**

1. Scotland
 2. England **THANK & CLOSE**
 3. Wales **THANK & CLOSE**
 4. Northern Ireland **THANK & CLOSE**
 5. Other **THANK & CLOSE**
-

Q5. Do you currently have any on-going complaints or issues with Scottish Water?

1. Yes **THANK & CLOSE**
 2. No
-

Q6. Can you select which council area you live in? **SINGLE CODE [DP USE DROP DOWN LIST]**

1. Aberdeen City
 2. Aberdeenshire
 3. Angus
 4. Argyll & Bute
 5. Clackmannanshire
 6. Dumfries & Galloway
 7. Dundee City
 8. East Ayrshire
 9. East Dunbartonshire
-

10. East Lothian
11. East Renfrewshire
12. Edinburgh, City of
13. Eilean Siar
14. Falkirk
15. Fife
16. Glasgow City
17. Highland
18. Inverclyde
19. Midlothian
20. Moray
21. North Ayrshire
22. North Lanarkshire
23. Orkney Islands
24. Perth & Kinross
25. Renfrewshire
26. Scottish Borders
27. Shetland Islands
28. South Ayrshire
29. South Lanarkshire
30. Stirling
31. West Dunbartonshire
32. West Lothian

CHECK QUOTAS – [BROAD SPREAD]

Q7. APPROX. SEG How would you describe the occupation type of the chief income earner in your household? **CAPI: READ OUT**

1. Senior managerial or professional
2. Intermediate managerial, administrative or professional
3. Supervisor; clerical; junior managerial, administrative or professional
4. Manual worker (with industry qualifications)
5. Manual worker (with no qualifications)
6. Unemployed
7. Retired
8. Student
9. Prefer not to say **SKIP TO SEG**

Q8. IF Q7=7 (RETIRED), ASK else SKIP Does the chief income earner have a state pension, a private pension or both?

1. State only
2. Private only
3. Both

Q9. IF Q8= PRIVATE OR BOTH, ASK else SKIP How would you describe the chief income earner's occupation type before retirement? **CAPI: READ OUT**

1. Senior managerial or professional
2. Intermediate managerial, administrative or professional
3. Supervisor, clerical, junior managerial, administrative or professional
4. Manual worker (with industry qualifications)
5. Manual worker (with no qualifications)
6. None of these

SEG CODE AS FOLLOWS:

IF Q7= 1 or 2; SEG = AB

IF Q7 = 3 or 4; SEG = C1/C2

IF Q7= 5; SEG = DE

IF Q7= 6; SEG = DE

IF Q7= 8; SEG = C1/C2

IF Q7 = 7 and Q8a = State only; SEG = DE

IF Q7= 7 and Q8= Private only OR Both and Q9 = 1; SEG = AB

IF Q7= 7 and Q8 = Private only OR Both and Q9= 2; SEG = AB

IF Q7= 7 and Q8 = Private only OR Both and Q9= 3; SEG = C1/C2

IF Q7= 7 and Q8 = Private only OR Both and Q9= 4; SEG = C1/C2

IF Q7= 7 and Q8 = Private only OR Both and Q9= 5; SEG = DE

IF Q7= 7 and Q8 = Private only OR Both and Q9= 6; SEG = DE

IF Q7= 9; SEG = Not stated

CHECK QUOTAS

F2F MINIMUM 40 DE, MINIMUM 40 C1C2,

Q10. What was your age at your last birthday? **ONLINE: PLEASE CLICK ON THE BOX BELOW AND TYPE YOUR ANSWER.**

WRITE IN

Prefer not to say

DP: PROGRAMME INTO BANDS

1. 16 to 24
2. 25 to 34
3. 35 to 49
4. 50 to 64
5. 65 to 74
6. 75 or over
7. Prefer not to say

CHECK QUOTAS

Q11. Does your property have a septic tank?

If you do have one, this would mean that your property is not connected to the main sewer and you would periodically arrange to have the septic tank emptied.

1. Yes **THANK AND CLOSE**
2. No
3. Don't know **THANK AND CLOSE**

Q12. Do you receive tap water from a public/mains supply or a private supply (eg spring, well etc.)? Please note 97% of Scotland is served by a public/mains supply.

1. Yes, I receive water from a public/ mains supply
2. No, I receive tap water from a private supply **THANK AND CLOSE**
3. Don't know **THANK AND CLOSE**

Q13. Do you, or does anyone in your household consider themselves to have a disability or an increased reliance on using water? **MULTICODE**

1. No **NOT WITH ANY OTHER CODE**
2. I have a disability (online only)
3. Someone in household has disability (online only)
4. I have an increased reliance on water supply (minimum of 10 for codes 4 +5, no maximum)
5. Someone in household has increased reliance on water supply (minimum of 10 for codes 4 +5 no maximum)
6. Learning disability (F2F only. Minimum of 10, no maximum)
7. Any other disability (minimum of 10, no maximum)

Q13c Which of the following best describes how you can access the Internet? **MULTICODE**

At home on a laptop, PC, tablet or other mobile device via wifi/broadband

On the move using a mobile or tablet

At work

At a library or internet café

None of these – I don't use the internet **NON INTERNET**

Q13d **ASK IF NONE OF THESE AT Q13C AND NOT CODE 6 (75+) AT Q10: Is anyone in your household aged 70 or more?**

Yes

No

Refused

CHECK QUOTAS

Q13a Please can you tell me which of the following bands best describes the total annual income of your household, before tax and other deductions?

Per Week

Up to £300

Over £300

Prefer not to say

Per Year

Under £15,600

Over £15,600

Minimum 20, no

CHECK QUOTAS

Q13b Is English the first language of this household?

Yes

No (minimum of 10, no maximum)

Main Questionnaire

Thank you, I can confirm you are in scope for the survey. The questionnaire will take about **ONLINE /CAPI:** 20 minutes to complete. **CAPI:** You will receive a £5 voucher for taking part.

You do not have to answer questions you do not wish to and you can terminate the interview at any point.

ONLINE: For convenience you can stop and return to complete the questionnaire as many times as you wish, although once submitted you will not be able to enter again.

Q16. Together with other organisations, Scottish Water is responsible for the quality of river and coastal bathing waters. It would be useful to understand some of your responses to this survey by also

understanding whether you spend any of your leisure time in or around rivers or beaches. Do you undertake any of the following leisure activities? **ONLINE:** PLEASE TICK ALL OPTIONS THAT APPLY TO YOU.

1. Fishing/angling
2. Swimming/paddling in the sea/ivers
3. Sailing or other water sports
4. Visiting beaches and/or river banks
5. Surfing
6. None of these **NOT WITH ANY OTHER CODE**
7. Other [Please specify] **OPEN TEXT BOX**

Choice Experiment Introduction

CAPI: Please now look at Show Card A (Service Measures).

On very rare occasions there may be issues with your water and waste water services. This section is about various types of water and waste water service issues. In all cases, the problem will last 24-48 hours **unless otherwise stated**. We'll now look at each of these in a little more detail.

ONLINE: On very rare occasions there may be issues with your water and waste water services. The list below shows various types of water and waste water service issues. In all cases, the problem will last 24-48 hours **unless otherwise stated**. Please click on  to see more information about each service issue.

- DRINKING WATER QUALITY 
- TASTE AND/OR ODOUR OF WATER WHICH IS NOT ACCEPTABLE 
- DISCOLOURED WATER 
- INTERRUPTIONS TO YOUR WATER SUPPLY 
- SURFACE WATER CLOSE TO YOUR PROPERTY 
- LOW WATER PRESSURE 
- SEWER FLOODING INSIDE YOUR PROPERTY 
- SEWER FLOODING CLOSE TO YOUR PROPERTY 
- SMELL FROM WASTE WATER TREATMENT WORKS 
- POLLUTION INCIDENTS 
- BATHING WATER QUALITY 
- RIVER WATER QUALITY 

DP: HOVER BUTTON TEXT FOR EACH SERVICE MEASURE IS SHOWN BELOW:

- **DRINKING WATER QUALITY:** There can be temporary problems with your drinking water which mean it doesn't meet minimum quality standards. Some instances can be **resolved** by **boiling** the water; in other instances **boiling** the water can be **ineffective**. You can still use water to bathe and flush the toilet as normal.
- **TASTE AND/OR ODOUR OF WATER WHICH IS NOT ACCEPTABLE:** There can be water at your property that tastes and smells unpleasant, but the water is safe to drink.
- **DISCOLOURED WATER:** There can be water at your property that regularly is discolored and therefore looks unpleasant, but is still safe to drink.

- **INTERRUPTIONS TO YOUR WATER SUPPLY:** On occasion your water supply may be unexpectedly interrupted meaning your property would have no water for a period of time. This can affect your daily routine as you would have no use of water during this time eg you would not be able to flush your toilet, use your kitchen tap or take a shower.
- **SURFACE WATER CLOSE TO YOUR PROPERTY:** A mains pipe may burst causing a visible water leak in a nearby road or water collecting in outside spaces.
- **LOW WATER PRESSURE:** There can be low water pressure that is permanent or recurring so that it takes longer to fill the bath or kettle than you would like. This may affect how well a combi boiler works as well as other appliances such as a dishwasher, washing machine or shower.
- **SEWER FLOODING INSIDE YOUR PROPERTY:** Sewage can flood under your floorboards, in a basement or in attached garages or from the outside through doors or vents. This will cause a foul smell and damage to your property.
- **SEWER FLOODING CLOSE TO YOUR PROPERTY:** There can be sewage that floods close to your property, or in your garden or detached garages or in public amenities such as local roads or community areas which affect their access and use.
- **SMELL FROM WASTE WATER TREATMENT WORKS:** There can be an unpleasant smell from a nearby waste water treatment works that you might encounter on a recurring basis at your home or when traveling past the works.
- **POLLUTION INCIDENTS:** There can be pollution incidents of different degrees of severity from the treatment of sewage that affect local waterways. These can lead to visible sewage debris and discolouration and can also kill fish.
- **BATHING WATER QUALITY:** Designated bathing waters are awarded a rating out of 3 stars. This rating is linked to health and the risk of contracting an infection or illness from bathing in the water. The signs shown display the rating of the beach.
- **RIVER WATER QUALITY:** Poor river water quality can affect the range of natural plants, fish and wildlife that live in the water, and if the water is poor, can cause unwanted algae to grow. It can also affect the suitability of the water for contact activities (i.e. swimming, boating, fishing).

CAPI: Can you read through Show Cards B1 to B12. Please do take your time and let me know when you are ready. **INTERVIEWER: CHECK IF RESPONDENT NEEDS MORE TIME BEFORE PROCEEDING.**

Q29. To your knowledge, have you or any of your relatives or friends experienced any of these problems in Scotland within the past year? **CAPI: READ OUT ONLINE: PLEASE SELECT BELOW AS APPROPRIATE – CLICK ON  IF YOU NEED MORE INFORMATION.**

CAPI: INTERVIEWER: FOR EACH SERVICE AREA, THERE IS A HOVER BUTTON WITH A BRIEF DESCRIPTION. IF A PARTICIPANT HAS ANY QUESTIONS OR IS UNSURE ABOUT WHAT ANY OF THE SERVICE FAILURES REFER TO, PLEASE USE THESE TO EXPLAIN OR REFER TO SHOW CARDS B1 to B12.

Within past year Never Don't know

- Drinking water quality issue i
- Taste and/or odour of water which is not acceptable i
- Discoloured water i
- Interruptions to the water supply i
- Surface water close to a property i
- Low water pressure i
- Sewer flooding inside a property i
- Sewer flooding outside a property i
- Smell from waste water treatment works i
- Pollution incidents i
- Poor bathing water quality i
- Poor river water quality i

Choice Experiment

In the next ten questions you will be shown cards like this– see show card C2 which has ‘EXAMPLE EXERCISE’ at the top: [ONLINE: SHOW EXAMPLE MAXDIFF CARD C2 CAPI: SHOW CARD C2].

EXAMPLE EXERCISE

The screenshot shows a choice experiment interface. At the top, it says "EXAMPLE EXERCISE". Below this are four cards, each with an image and a text description of a water service issue. Each card has a small blue circle with an 'i' icon at the bottom. The cards are:

- Card 1:** Image of water dripping from a tap. Text: "You have low water pressure in your home. This will affect how well your water appliances will work (showers, taps, washing machines etc.). This is a permanent problem." Icon: i
- Card 2:** Image of a person drinking water. Text: "Your water has an unpleasant taste and/or odour. Your water company tells you it is safe to drink." Icon: i
- Card 3:** Image of a dog sniffing the ground in a park. Text: "You see sewage on part of your local park." Icon: i
- Card 4:** Image of sewage on a floor. Text: "You find sewage in your home. It is coming in from the outside under your front door." Icon: i

Below the cards are two horizontal sliders. The top slider is labeled "Most impact" and the bottom slider is labeled "Least impact". Both sliders have four circular markers corresponding to the four cards. A red banner at the bottom of the interface contains the text: "Please note, this is an example so you won't be able to click on any of the options".

For each question you will be asked to choose which of the four service issues would have the **most impact**, and which would have the **least impact** on you and your day-to-day life.

Some of the service issues shown would affect your own property whereas others would affect your local area. When comparing please consider how you would feel generally about the service issue happening, including any concerns you may have about your local area and the environment.

CAPI INTERVIEWER PLEASE TURN THE TABLET SIDEWAYS TO DISPLAY THE CHOICE EXPERIMENTS PROPERLY

Q30. Max/diff 1

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Q31. Max/diff 2

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Q32. Max/diff 3

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Q33. Max/diff 4

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Q34. Max/diff 5

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Q35. Max/diff 6

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Q36. Max/diff 7

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Q37. Max/diff 8

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Q38. Max/diff 9

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Q39. Max/diff 10

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Follow-up Questions

Q52. Here are a few questions about the choices you have just made.

Did you generally feel able to choose between the options presented to you?

1. Yes **GO TO Q54**
 2. No
-

Q53. **SKIP IF Q52=1** Why weren't you able to choose between the options presented to you? **CAPI: RECORD VERBATIM**

Q54. Were any of the service issues hard for you to understand?

- Yes
No **GO TO Q57**
-

Q55. Which service issues did you feel were hard to understand? **CAPI: RECORD VERBATIM**

Q56. Why was it/ they hard to understand? **CAPI: RECORD VERBATIM**

Q57. **COUNTDOWN TIMER – 30 seconds**



“Name up to three things that Scottish Water should concentrate on in the future” (gamification question)

Classification Questions

Q59. Are you....

1. Male
 2. Female
 3. Prefer not to say
-

Q60. **ONLINE** [Please enter] **CAPI** [What is] the name of the town or city where you live. If you live in a remote location, enter the name of the nearest town.

SPECIFY

Q61. How would you describe the area you live in?

1. Urban – eg a town or city
2. Rural – but within a 30 minute drive of a town or city
3. Remote rural – more than a 30 minute drive to a town or city

Q61a Can you tell me if you live on an island?

1. Yes
2. No

Q62. What is your employment status?

1. Working full-time
2. Working part-time
3. Not working – looking for work
4. Not working – not looking for work
5. Full-time student
6. Part-time student
7. Retired
8. Retired unpaid voluntary work
9. Looking after family/home
10. Other **SPECIFY**
11. Prefer not to say

Q63. To help us analyse your responses can you tell me which of the following bands best describes the total annual income of your household, before tax and other deductions?

	Per Week	Per Year
A	Up to £300	Under £15,600
B	£301-£1000	£15,601 - £52,000
C	£1001+	£52,001+
D	Prefer not to say	

Q64. We really appreciate the time that you have given us today. Would you be willing to be contacted again for clarification purposes or be invited to take part in other related research for Scottish Water?

1. Yes, for both clarification and further related research
2. Yes, for clarification only
3. Yes, for further related research only
4. No

ONLINE: Thank you. This research was conducted under the terms of the MRS code of conduct and is completely confidential.

CAPI: Thank you. This research was conducted under the terms of the MRS code of conduct and is completely confidential. If you would like to confirm my credentials or those of Accent please call the MRS free on.

HAND OVER THE THANK YOU SLIP.

Please can I take a note of your name and where we can contact you for quality control purposes?

Respondent name:

Telephone:

HAND OVER THE INCENTIVE If you have any queries about your incentive please contact us on 020 8742 2211.
Thank you.

CAPI: Interviewer Confirmation

CAPI: I confirm that this interview was conducted under the terms of the MRS code of conduct and is completely confidential

Yes

No

SYSTEM INFORMATION

Time interview completed:

APPENDIX B

Non-Household Questionnaire

SYSTEM INFORMATION:

Interviewer number

Interviewer name

Date:

Time interview started:

Introduction

Good morning/afternoon/evening. My name is from Accent and I am carrying out research for Scottish Water to understand customers' priorities for water and sewerage services. **IF REQUIRED:** You will get your bills from a separate company but this survey is about the services delivered by Scottish Water.

Please may I speak to whoever is responsible – either jointly or solely – for paying your organisation's water bills and/or liaising with your water supplier? **WHEN SPEAKING TO APPROPRIATE CONTACT CONTINUE WITH EXPLANATION**

This is a *bona fide* market research exercise. It is being conducted under the Market Research Society Code of Conduct which means that any answers you give will be treated in confidence. This call may be recorded for quality control and training purposes.

Can I just ask you a few questions to check that you are eligible to take part in this research?

Scoping questions

Q65. Do you or any of your close family work or have any of you worked in either market research or in the water industry (including working for Scottish Water)?

Yes **THANK & CLOSE**

No

Q66. Can I please confirm that you are responsible – in some part – for your organisation's water and waste/sewerage bill and/or liaising with your water supplier?

Yes

No thank & close

Q67. Can I confirm your organisation has all or some of its premises in Scotland? **SINGLE CODE**

Yes, some or all in Scotland

No, all elsewhere **THANK AND CLOSE**

Q68. Do you currently have any on-going complaints or issues with Scottish Water?

Yes **THANK & CLOSE**

No

Q69. Can you tell me which council area your business is based in, or mainly based in? **SINGLE CODE [DP USE DROP DOWN LIST]**

1. Aberdeen City
2. Aberdeenshire

3. Angus
4. Argyll & Bute
5. Clackmannanshire
6. Dumfries & Galloway
7. Dundee City
8. East Ayrshire
9. East Dunbartonshire
10. East Lothian
11. East Renfrewshire
12. Edinburgh, City of
13. Eilean Siar/Western Isles
14. Falkirk
15. Fife
16. Glasgow City
17. Highland
18. Inverclyde
19. Midlothian
20. Moray
21. North Ayrshire
22. North Lanarkshire
23. Orkney Islands
24. Perth & Kinross
25. Renfrewshire
26. Scottish Borders
27. Shetland Islands
28. South Ayrshire
29. South Lanarkshire
30. Stirling
31. West Dunbartonshire
32. West Lothian

CHECK QUOTAS – [BROAD SPREAD]

Q70. How many employees does your company have at your place of work?

- None, sole trader
- 1 to 9 employees
- 10 to 49 employees
- 50 to 249 employees
- Over 250 employees

CHECK QUOTA

Q71. And what business sector best defines the core activity of your organisation?

- 1 : Agriculture, forestry & fishing
- 2 : Mining, quarrying & utilities
- 3 : Manufacturing
- 4 : Construction
- 5 : Motor trades
- 6 : Wholesale
- 7 : Retail
- 8 : Transport & storage (inc postal)
- 9 : Accommodation & food services
- 10 : Information & communication
- 11 : Financial & insurance
- 12 : Property

- 13 : Professional, scientific & technical
- 14 : Business administration & support services
- 15 : Public administration & defense
- 16 : Education
- 17 : Health
- 18 : Arts, entertainment, recreation & other services
- 19: Don't know **THANK AND CLOSE**

CHECK QUOTA

Q72. Does your property have a septic tank?

If you do have one, this would mean that your property is not connected to the main sewer and you would periodically arrange to have the septic tank emptied.

Yes **THANK AND CLOSE**

No

Don't know **THANK AND CLOSE**

Q73. Do you receive tap water from a public/mains supply or a private supply (eg spring, well etc.)?
Please note 97% of Scotland is served by a public/mains supply.

Yes, I receive water from a public/ mains supply

No, I receive tap water from a private supply **THANK AND CLOSE**

Don't know **THANK AND CLOSE**

Main Questionnaire

Thank you, I can confirm you are in scope for the survey. The questionnaire will take about 20 minutes to complete.

Just to clarify, as a business customer you have a contract with your licensed provider (who you pay your bills to). However, your water and waste water services are supplied by Scottish Water, who is responsible for managing the water and sewerage network. This is just like having your energy bills with Sainsbury's Energy and receiving your supply of gas and electricity from British Gas.

You do not have to answer questions you do not wish to and you can terminate the interview at any point.

You do need to have some materials in front of you which I can either email to you now and we can carry on or I can email or post them to you and we can make an arrangement to talk at a convenient time for you.

Q12. Together with other organisations, Scottish Water is responsible for the quality of river and coastal bathing waters. It would be useful to understand some of your responses to this survey by also understanding whether any of your business activity or income is related to activities in or around rivers or beaches. Do any of the following apply?

Fishing/angling

Swimming/paddling in the sea/rivers

Sailing or other water sports

Visiting beaches and/or river banks

Surfing

None of these **NOT WITH ANY OTHER CODE**

Choice Experiment Introduction

Please now look at Show Card A (Service Measures).

On very rare occasions there may be issues with your water and waste water services. This section is about various types of water and waste water service issues. In all cases, the problem will last 24-48 hours unless otherwise stated. We'll now look at each of these in a little more detail.

- DRINKING WATER QUALITY
- TASTE AND/OR ODOUR OF WATER WHICH IS NOT ACCEPTABLE
- DISCOLOURED WATER
- INTERRUPTIONS TO YOUR WATER SUPPLY
- SURFACE WATER CLOSE TO YOUR PLACE OF WORK
- LOW WATER PRESSURE
- SEWER FLOODING INSIDE YOUR PLACE OF WORK
- SEWER FLOODING CLOSE TO YOUR PLACE OF WORK
- SMELL FROM WASTE WATER TREATMENT WORKS
- POLLUTION INCIDENTS
- BATHING WATER QUALITY
- RIVER WATER QUALITY

DP: INTERVIEWER HOVER/SHOW CARD TEXT FOR EACH SERVICE MEASURE IS SHOWN BELOW:

- **DRINKING WATER QUALITY:** There can be temporary problems with your drinking water which means it doesn't meet minimum quality standards. Some instances can be resolved by **boiling the water**; in other instances **boiling** the water can be **ineffective**. You can still use water for flushing toilets.
- **TASTE AND/OR ODOUR OF WATER WHICH IS NOT ACCEPTABLE:** There can be water at your place of work that tastes and smells unpleasant, but the water is safe to drink.
- **DISCOLOURED WATER:** There can be water at your place of work that regularly is discolored and therefore looks unpleasant, but is still safe to drink.
- **INTERRUPTIONS TO YOUR WATER SUPPLY:** On occasion your water supply may be unexpectedly interrupted meaning your place of work would have no water for a period of time. This can affect your daily working routine as you would have no use of water during this time eg you would not be able to flush the toilets, use the taps or showers, or machines that use water.
- **SURFACE WATER CLOSE TO YOUR PLACE OF WORK:** A mains pipe may burst causing a visible water leak in a nearby road or water collecting in outside spaces.
- **LOW WATER PRESSURE:** There can be low water pressure in your workplace that is permanent or recurring. This may affect how well your water appliances and production processes will work (production lines, taps, or machinery which uses water).
- **SEWER FLOODING INSIDE YOUR PLACE OF WORK:** Sewage can flood under your floorboards, in a basement, storage areas or from the outside through doors or vents. This will cause a foul smell and damage to your place of work.
- **SEWER FLOODING CLOSE TO YOUR PLACE OF WORK:** There can be sewage that floods close to your place of work, or in your surrounding outside space or in public amenities such as local roads or community areas which affect their access and use.

- **SMELL FROM WASTE WATER TREATMENT WORKS:** There can be an unpleasant smell from a nearby waste water treatment works that you might encounter on a recurring basis at your place of work or when traveling past the treatment works.
- **POLLUTION INCIDENTS:** There can be pollution incidents of different degrees of severity from the treatment of sewage that affect local waterways. These can lead to visible sewage debris and discolouration and can also kill fish.
- **BATHING WATER QUALITY:** Designated bathing waters are awarded a rating out of 3 stars. This rating is linked to health and the risk of contracting an infection or illness from bathing in the water. The signs shown display the rating of the beach.
- **RIVER WATER QUALITY:** Poor river water quality can affect the range of natural plants, fish and wildlife that live in the water, and if the water is poor, can cause unwanted algae to grow. It can also affect the suitability of the water for contact activities (i.e. swimming, boating, fishing).

Can you read through Show Cards B1 to B12. Please do take your time and let me know when you are ready. **INTERVIEWER: CHECK IF RESPONDENT NEEDS MORE TIME BEFORE PROCEEDING.**

Q25. To your knowledge, has your business or any other businesses or organisations you know experienced any of these problems in Scotland within the past year? You can refer back to Show Cards B1 to B12 if you need to. **READ OUT.**

	Within past year	Never	Don't know
Drinking water quality issue			
Taste and/or odour of water which is not acceptable			
Discoloured water			
Interruptions to the water supply			
Surface water close to a property/place of work			
Low water pressure			
Sewer flooding inside a property/place of work			
Sewer flooding outside a property/place of work			
Smell from waste water treatment works			
Pollution incidents			
Poor bathing water quality			
Poor river water quality			

Choice Experiment

[IMPACT BLOCK TEXT]

In the next ten questions you will be shown cards like this – see show card C2 which has ‘EXAMPLE EXERCISE’ at the top: [SHOW EXAMPLE MAXDIFF CARD C2].

For each question you will be asked to choose which of the four service issues would have the **most impact**, and which would have the **least impact** on you and your business activities.

Some of the service issues shown would affect your place of work whereas others would affect your local area. When comparing please consider how you would feel generally about the service issue happening, including any concerns you may have about your local area and the environment.

Now turn to show card D1

Max/diff 1 Please look at choice card D1

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Max/diff 2 Please look at choice card D2

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Max/diff 3 Please look at choice card D3

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Max/diff 4 Please look at choice card D4

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Max/diff 5 Please look at choice card D5

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Max/diff 6 Please look at choice card D6

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Max/diff 7 Please look at choice card D7

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Max/diff 8 Please look at choice card D8

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Max/diff 9 Please look at choice card D9

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Max/diff 10 Please look at choice card D10

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

Follow-up Questions

Here are a few questions about the choices you have just made.

Q48. Did you generally feel able to choose between the options presented to you?

1. Yes **GO TO Q50**
2. No **GO TO Q49**

Q49. **SKIP IF Q48=1** Why weren't you able to choose between the options presented to you? **RECORD VERBATIM**

Q50. Were any of the service issues hard for you to understand?

1. Yes **GO TO Q51**
2. No **GO TO Q54**

Q51. Which service issues did you feel were hard to understand? **RECORD VERBATIM**

Q52. Why was it/ they hard to understand? **RECORD VERBATIM**

Q54. **COUNTDOWN TIMER – 30 seconds** "Name up to three things that Scottish Water should concentrate on in the future" (gamification question)

INTERVIEWER READ BOX BELOW. Click next to start when participant is ready. Say stop when time is up. Move onto the next screen if the participant has finished before the timer is up.

Classification Questions

Q55. **DO NOT ASK** Code as:

- Male
- Female

Q57a Is your business operation dependent on your water supply?

- Yes
- No
- Don't Know

Q58. How many sites does your business operate from in Scotland?

- 1
- 2
- 3
- 4+

Q59. How much is your organisation's annual bill from your Licensed Provider? If you do not know exactly, please try and give your best estimate. **DP: DO NOT ALLOW ACTUAL BILL BOX TO BE**

FILLED IN AS WELL AS THE BUTTONS BELOW IT INTERVIEWER: RECORD ACTUAL BILL IF KNOWN, ELSE THE BAND IT FALLS INTO.

£

SMALL (Bill <£1,000 pa)

MEDIUM (Bill £1,000-£19,999 pa)

LARGE (Bill £20,000+ pa)

Don't know

Q60. Can you enter the name of the town or city where your business is mainly located? If this is a remote location, enter the name of the nearest town.

SPECIFY

Q61. How would you describe this place? Is it....

4. Urban – eg a town or city
5. Rural – but within a 30 minute drive of a town or city
6. Remote rural – more than a 30 minute drive to a town or city

Q61a Can you tell me if you're located on an island?

Yes

No

Q62. We really appreciate the time that you have given us today. Would you be willing to be contacted again for clarification purposes or be invited to take part in other related research for Scottish Water?

5. Yes, for both clarification and further related research
6. Yes, for clarification only
7. Yes, for further related research only
8. No

Thank you. This research was conducted under the terms of the MRS code of conduct and is completely confidential. If you would like to confirm my credentials or those of Accent please call the MRS free on 0500 396999.

Please can I take a note of your name and where we can contact you for quality control purposes?

Respondent name: [CATI: DP, IMPORT FROM ID]

Business Telephone: [CATI: DP, IMPORT FROM TELNUMBER]

Interviewer Confirmation

I confirm that this interview was conducted under the terms of the MRS code of conduct and is completely confidential

Yes

No

SYSTEM INFORMATION

Time interview completed:

APPENDIX C

Household Show Cards

SHOW CARD A

Service Measures

This is about various types of water and waste water service issues. On very rare occasions there may be issues with your water and waste water services. In all cases, the problem will last 24-48 hours unless otherwise stated.

- DRINKING WATER QUALITY
- TASTE AND/OR ODOUR OF WATER WHICH IS NOT ACCEPTABLE
- DISCOLOURED WATER
- INTERRUPTIONS TO YOUR WATER SUPPLY
- SURFACE WATER CLOSE TO YOUR PROPERTY
- LOW WATER PRESSURE
- SEWER FLOODING INSIDE YOUR PROPERTY
- SEWER FLOODING CLOSE TO YOUR PROPERTY
- SMELL FROM WASTE WATER TREATMENT WORKS
- POLLUTION INCIDENTS
- BATHING WATER QUALITY
- RIVER WATER QUALITY

HH Pilot v19

SHOW CARD B1

DRINKING WATER QUALITY

There can be temporary problems with your drinking water which mean it doesn't meet minimum quality standards.

Some instances can be **resolved** by **boiling** the water; in other instances **boiling** the water can be **ineffective**. You can still use water to bathe and flush the toilet as normal.

SHOW CARD B2

TASTE AND/OR ODOUR OF WATER WHICH IS NOT ACCEPTABLE

There can be water at your property that tastes and/or smells unpleasant, but the water is safe to drink.

SHOW CARD B3

DISCOLOURED WATER

There can be water at your property that regularly is discoloured and therefore looks unpleasant, but is still safe to drink.



SHOW CARD B4

INTERRUPTIONS TO YOUR WATER SUPPLY

On occasion your water supply may be unexpectedly interrupted meaning your property would have no water for a period of time.

This can affect your daily routine as you would have no use of water during this time eg you would not be able to flush your toilet, use your kitchen tap or take a shower.

SHOW CARD B5

SURFACE WATER CLOSE TO YOUR PROPERTY

A mains pipe may burst causing a visible water leak in a nearby road or water collecting in outside spaces.



SHOW CARD B6

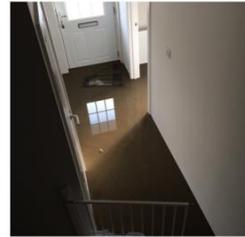
LOW WATER PRESSURE

There can be low water pressure that is permanent or recurring so that it takes longer to fill the bath or kettle than you would like. This may affect how well a combi boiler works as well as other appliances such as a dishwasher, washing machine or shower.

SHOW CARD B7

SEWER FLOODING INSIDE YOUR PROPERTY

Sewage can flood under your floorboards, in a basement or in attached garages or from the outside through doors or vents. This will cause a foul smell and damage to your property.



SHOW CARD B8

SEWER FLOODING CLOSE TO YOUR PROPERTY

There can be sewage that floods close to your property, or in your garden or detached garages or in public amenities such as local roads or community areas which affect their access and use.



SHOW CARD B9

SMELL FROM WASTE WATER TREATMENT WORKS

There can be an unpleasant smell from a nearby waste water treatment works that you might encounter on a recurring basis at your home or when traveling past the works.

SHOW CARD B10

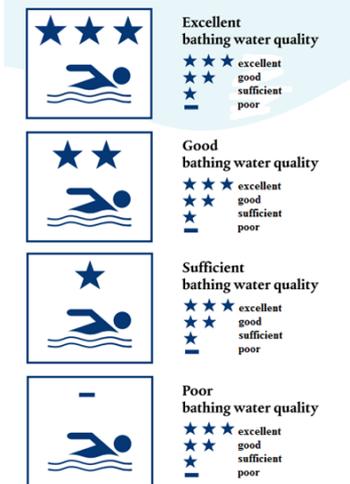
POLLUTION INCIDENTS

There can be pollution incidents of different degrees of severity from the treatment of sewage that affect local waterways. These can lead to visible sewage debris and discolouration and can also kill fish.

SHOW CARD B11

BATHING WATER QUALITY

These are the signs you could see at a beach to describe the bathing water quality.



SHOW CARD B12

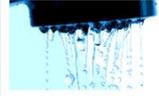
RIVER WATER QUALITY

Poor river water quality can affect the range of natural plants, fish and wildlife that live in the water, and if the water is poor, can cause unwanted algae to grow. It can also affect the suitability of the water for contact activities (i.e. swimming, boating, fishing).

SHOW CARD C2

EXAMPLE EXERCISE

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

 <p>Your water company tells you that your water is not safe to drink, even after boiling. You can use it to bathe and flush the toilet as normal.</p> <p>I</p>	 <p>You see sewage on part of your local park.</p> <p>I</p>	 <p>A sign at your local beach states that the bathing water quality has been awarded one out of three stars, and a rating of 'Sufficient'.</p> <p>I</p>	 <p>You have low water pressure in your home. This will affect how well your water appliances will work (showers, taps, washing machines etc.). This is a permanent problem.</p> <p>I</p>	
Most impact	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Least impact	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please note, this is an example so you won't be able to click on any of the options

APPENDIX D

Non-Household Show Cards

SHOW CARD A

Service Measures

This is about various types of water and waste water service issues. On very rare occasions there may be issues with your water and waste water services. In all cases, the problem will last 24-48 hours unless otherwise stated.

- DRINKING WATER QUALITY
- TASTE AND/OR ODOUR OF WATER WHICH IS NOT ACCEPTABLE
- DISCOLOURED WATER
- INTERRUPTIONS TO YOUR WATER SUPPLY
- SURFACE WATER CLOSE TO YOUR PLACE OF WORK
- LOW WATER PRESSURE
- SEWER FLOODING INSIDE YOUR PLACE OF WORK
- SEWER FLOODING CLOSE TO YOUR PLACE OF WORK
- SMELL FROM WASTE WATER TREATMENT WORKS
- POLLUTION INCIDENTS
- BATHING WATER QUALITY
- RIVER WATER QUALITY

NHH Cogs v15

SHOW CARD B1

DRINKING WATER QUALITY

There can be temporary problems with your drinking water which mean it doesn't meet minimum quality standards.

Some instances can be **resolved** by **boiling** the water; in other instances **boiling** the water can be **ineffective**. You can still use water for flushing toilets.

SHOW CARD B2

TASTE AND/OR ODOUR OF WATER WHICH IS NOT ACCEPTABLE

There can be water at your place of work that tastes and/or smells unpleasant, but the water is safe to drink.

SHOW CARD B3

DISCOLOURED WATER

There can be water at your place of work that regularly is discoloured and therefore looks unpleasant, but is still safe to drink.



SHOW CARD B4

INTERRUPTIONS TO YOUR WATER SUPPLY

On occasion your water supply may be unexpectedly interrupted meaning your place of work would have no water for a period of time.

This can affect your daily working routine as you would have no use of water during this time eg you would not be able to flush the toilets, use the taps or showers or machines that use water.

SHOW CARD B5

SURFACE WATER CLOSE TO YOUR PLACE OF WORK

A mains pipe may burst causing a visible water leak in a nearby road or water collecting in outside spaces.



SHOW CARD B6

LOW WATER PRESSURE

There can be low water pressure in your workplace that is permanent or recurring. This may affect how well your water appliances and production processes will work (production lines, taps, or machinery which uses water).

SHOW CARD B7

SEWER FLOODING INSIDE YOUR PLACE OF WORK

Sewage can flood under your floorboards, in a basement, storage areas or from the outside through doors or vents. This will cause a foul smell and damage to your place of work.



SHOW CARD B8

SEWER FLOODING CLOSE TO YOUR PLACE OF WORK

There can be sewage that floods close to your place of work, or in your surrounding outside space or in public amenities such as local roads or community areas which affect their access and use.



SHOW CARD B9

SMELL FROM WASTE WATER TREATMENT WORKS

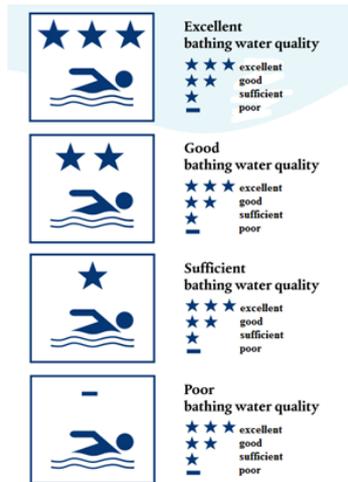
There can be an unpleasant smell from a nearby waste water treatment works that you might encounter on a recurring basis at your place of work or when traveling past the treatment works.

POLLUTION INCIDENTS

There can be pollution incidents of different degrees of severity from the treatment of sewage that affect local waterways. These can lead to visible sewage debris and discolouration and can also kill fish.

BATHING WATER QUALITY

Designated bathing waters are awarded a rating out of 3 stars. This rating is linked to health and the risk of contracting an infection or illness from bathing in the water. The signs shown display the rating of the beach.



SHOW CARD B12

RIVER WATER QUALITY

Poor river water quality can affect the range of natural plants, fish and wildlife that live in the water, and if the water is poor, can cause unwanted algae to grow. It can also affect the suitability of the water for contact activities (i.e. swimming, boating, fishing).

SHOW CARD C2

EXAMPLE EXERCISE

Which of these service issues would have the **most impact** and which would have the **least impact** on you?

 <p>You find sewage outside of your workplace. You can get in and out of your workplace as normal.</p> <p>1</p>	 <p>You see water coming out of the ground in a garden or path close to your place of work.</p> <p>1</p>	 <p>You notice a visible impact on a local waterway including sewage debris and discolouration over a distance of more than a mile. There are a significant number of dead fish over that distance and a smell of sewage.</p> <p>1</p>	 <p>You find sewage in your workplace. It has come up through your plumbing (i.e. toilet or wash basin).</p> <p>1</p>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Most impact
Least impact

APPENDIX E

Segmentation and Experience Analysis

Segmentation Analysis

The following tables present segmentation results for household and non-households. Household segmentations include age, gender and SEG, area, zone, vulnerability and water related activities, non-household segmentations include area, zone, number of employees, number of branches, dependency on water supply, bill size and industry. The number of respondents in each segment is summarised in Table 17 and Table 18. We would advise caution against any inferences based on sample sizes below 50.

The results from the segmentation analysis of the Impact scores are first presented for households. In all cases, Impact scores are scaled to sum to 100 for each segment. This approach helps to ensure that comparisons between segments are not influenced by the arbitrary choice of which service issue to treat as a benchmark. We have further investigated the statistical significance between the corresponding segments via t-test.

Results for all samples and segments are displayed in Table 19 through to Table 33.

Table 17: Segmentation variables, segments and sample sizes - households

Variable	Segments	Number of Respondents
Gender	Male	487
	Female	518
Area	Urban	680
	Rural	325
Zone	Central Belt*	495
	Others	510
Age	16-34	156
	35-49	252
	50-64	320
	65plus	267
SEG	A & B	204
	C1 & C2	333
	D & E	181
Vulnerability	Vulnerable	198
	Non-Vulnerable	807
Water-related activities	Any Water Related Activities	652
	No Water Related Activities	353
Experienced Issues	Drinking water quality issue	108
	Taste/Odour	104
	Discolouration	230
	Interruptions	177
	Surface water close to a prop.	99
	Water pressure	181
	Internal/External flooding	60
	Smell from sewage works	74
	Bathing/River water quality	61
Time required to complete questionnaire	Slow**	503
	Fast	502

*Includes: City of Glasgow, City of Edinburgh, North Lanarkshire, South Lanarkshire, West Lothian, Renfrewshire, Falkirk, East Dunbartonshire, East Lothian, Midlothian and Clackmannshire

** Separates between fast and slow depending on the time used to complete the questionnaire. The split is used at the median.

Table 18: Segmentation variables, segments and sample sizes – non-households

Variable	Segments	Number of Respondents
Area	Urban	296
	Rural	104
Number of Employees	Sole Trader	53
	1 – 9 employees	244
	10 or more employees	103
Zone	Central Belt*	188
	Others	212
Number of Branches	1	279
	2 or 3	54
	4 or more	67
Dependency on Water Supply	Dependent	183
	Not dependent	217
Bill Size	Small	170
	Medium	125
	Large*	20
Industry*	Agriculture, Forestry & Fishing	14
	Manufacturing	21
	Construction	38
	Motor Trades	15
	Retail	46
	Accommodation & Food Service	51
	Communication & Information	16
	Finance & Insurance	16
	Science	45
	Business Administration & Support Services	23
	Health	27
	Arts, Entertainment, Recreation & Other Services	40
	Others	48

Households

The results in the following tables show that the rank order is largely consistent across segments whereas the scale of the Impact score can vary substantially. From the analysed segmentation variables, gender proves as the most consistent as only four of the differences between men and women pass for statistical significance at 10% or higher. For all other factors, there is a substantial number of attribute levels that prove significantly different between the respective segments; there are a list of attributes standing out as they prove statistically indifferent among almost all segments. Those are “Unexpected interruption (3h-6h)”, “Unexpected interruption (24h-72h)”, “Sewage in home through plumbing”, “Sewage in home in garage/basement” and “Sewage in home from under front door”.

Table 19: Impact score by gender - households

Service issue	Impact score		t-test significance
	Male [1]	Female [2]	[1]=[2]
Sewage in home from under front door	18.3	17.4	
Sewage in home through plumbing	18.7	15.9	
Sewage in home under floorboards	14.1	19.6	
Sewage in home in garage/basement	8.2	7.9	
Unsafe to drink (24h-48h)	5.8	6.9	
Unexpected interruption (24h-72h)	6.0	5.3	
Sewage in garden - difficult to access	4.5	4.9	
Unexpected interruption (12h-24h)	4.7	3.8	*
Sewage in garden - normal access	1.9	2.5	***
Boil before drinking (24h-48h)	1.9	1.6	
Poor pressure (Permanent)	1.8	1.5	
Pollution incident - Cat 1	1.5	1.2	
Unpleasant taste/odour (24h-48h)	1.2	1.2	
Sewage on local road	1.2	1.1	
Pollution incident - Cat 2	1.2	1.0	*
Poor pressure (Recurring)	1.2	1.0	
Pollution incident - Cat 3	1.1	0.9	
Unexpected interruption (3h-6h)	1.0	0.9	
Sewage on local park	0.9	0.8	
Odour smelt from home	0.8	0.7	
Mains burst close to home (24h-48h)	0.7	0.7	
Discoloured water(24h-48h)	0.6	0.6	
River water quality = Bad	0.5	0.5	
River water quality = Poor	0.5	0.4	
Mains burst local area (24h-48h)	0.4	0.5	**
River water quality = Moderate	0.3	0.3	
Bathing water quality = Poor	0.3	0.3	
Bathing water quality = Sufficient	0.2	0.2	
Bathing water quality = Good	0.2	0.2	
Odour smelt while travelling	0.1	0.2	

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 20: Impact score by age - households

Service issue	Impact score				t-test significance		
	All	16-34 [1]	35-64 [2]	65plus [3]	[1]=[2]	[1]=[3]	[2]=[3]
Sewage in home from under front door	17.9	12.3	18.2	23.8			
Sewage in home through plumbing	17.4	12.5	18.6	16.8			
Sewage in home under floorboards	16.5	14.7	16.9	15.8			
Sewage in home in garage/basement	8.1	8.1	7.2	10.1			
Unsafe to drink (24h-48h)	6.3	9.6	5.7	5.5		*	
Unexpected interruption (24h-72h)	5.7	7.7	5.7	4.4		*	**
Sewage in garden - difficult to access	4.7	3.6	4.8	5.0	***	**	
Unexpected interruption (12h-24h)	4.3	5.3	4.1	3.7			
Sewage in garden - normal access	2.2	2.0	2.4	1.9	**		***
Boil before drinking (24h-48h)	1.8	2.7	1.7	1.3	***	***	***
Poor pressure (Permanent)	1.7	2.3	1.8	1.1	***	***	***
Pollution incident - Cat 1	1.3	2.1	1.2	1.0	***	***	***
Unpleasant taste/odour (24h-48h)	1.2	2.2	1.2	0.8	***	***	***
Sewage on local road	1.2	1.2	1.1	1.1		**	
Pollution incident - Cat 2	1.1	1.2	1.1	0.9	***	***	***
Poor pressure (Recurring)	1.1	1.3	1.0	0.9	***	***	***
Pollution incident - Cat 3	1.0	1.3	1.0	0.8	***	***	***
Unexpected interruption (3h-6h)	1.0	1.9	0.9	0.6	***	***	***
Sewage on local park	0.9	1.0	0.8	0.8	***	***	**
Odour smelt from home	0.8	1.4	0.7	0.6	***	***	***
Mains burst close to home (24h-48h)	0.7	1.2	0.6	0.6	***	***	***
Discoloured water(24h-48h)	0.6	1.2	0.6	0.4	***	***	***
River water quality = Bad	0.5	0.5	0.5	0.4		***	***
River water quality = Poor	0.5	0.7	0.4	0.4	***	***	*
Mains burst local area (24h-48h)	0.5	0.5	0.5	0.4		***	***
River water quality = Moderate	0.3	0.3	0.3	0.2	***	***	***
Bathing water quality = Poor	0.3	0.4	0.3	0.2	***	***	***
Bathing water quality = Sufficient	0.2	0.4	0.2	0.2	***	***	***
Bathing water quality = Good	0.2	0.3	0.2	0.1	***	***	***
Odour smelt while travelling	0.1	0.2	0.1	0.1	***	***	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 21: Impact score by SEG - households

Service issue	Impact score			t-test significance		
	AB [1]	C1C2 [2]	DE [3]	[1]=[2]	[1]=[3]	[2]=[3]
Sewage in home from under front door	17.3	17.9	13.2			
Sewage in home through plumbing	18.5	17.8	14.0			
Sewage in home under floorboards	22.2	16.0	14.5			
Sewage in home in garage/basement	7.6	8.1	6.5			
Unsafe to drink (24h-48h)	5.0	6.3	8.3		*	
Unexpected interruption (24h-72h)	4.7	6.1	7.1			
Sewage in garden - difficult to access	4.7	4.7	4.3			
Unexpected interruption (12h-24h)	4.2	4.4	4.4			
Sewage in garden - normal access	2.3	2.4	2.1			
Boil before drinking (24h-48h)	1.5	1.8	2.6	***	***	***
Poor pressure (Permanent)	1.5	1.9	2.1	***	***	
Pollution incident - Cat 1	1.0	1.3	1.9	***	***	***
Unpleasant taste/odour (24h-48h)	1.1	1.2	2.0	***	***	***
Sewage on local road	0.9	0.9	1.8		***	***
Pollution incident - Cat 2	0.8	1.1	1.4	***	***	***
Poor pressure (Recurring)	1.0	1.1	1.2	*	***	**
Pollution incident - Cat 3	0.8	1.0	1.4	***	***	***
Unexpected interruption (3h-6h)	0.8	1.0	1.5	***	***	***
Sewage on local park	0.8	0.7	1.0		***	***
Odour smelt from home	0.5	0.7	1.4	***	***	***
Mains burst close to home (24h-48h)	0.6	0.5	1.2	*	***	***
Discoloured water(24h-48h)	0.4	0.7	1.1	***	***	***
River water quality = Bad	0.3	0.5	1.0	***	***	***
River water quality = Poor	0.4	0.3	1.0	***	***	***
Mains burst local area (24h-48h)	0.4	0.4	0.6	***	***	***
River water quality = Moderate	0.2	0.3	0.5	***	***	***
Bathing water quality = Poor	0.2	0.3	0.5	***	***	***
Bathing water quality = Sufficient	0.1	0.2	0.5	***	***	***
Bathing water quality = Good	0.1	0.2	0.5	***	***	***
Odour smelt while travelling	0.1	0.1	0.3	***	***	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 22: Impact score by area - households

Service issue	Impact score		t-test significance
	Urban [1]	Rural [2]	[1]=[2]
Sewage in home from under front door	18.6	16.6	
Sewage in home through plumbing	17.6	16.7	
Sewage in home under floorboards	17.8	14.3	
Sewage in home in garage/basement	7.2	10.2	*
Unsafe to drink (24h-48h)	6.3	6.3	
Unexpected interruption (24h-72h)	5.7	5.5	
Sewage in garden - difficult to access	4.5	5.1	**
Unexpected interruption (12h-24h)	4.6	3.6	***
Sewage in garden - normal access	2.0	2.7	***
Boil before drinking (24h-48h)	1.7	1.8	
Poor pressure (Permanent)	1.6	1.8	***
Pollution incident - Cat 1	1.3	1.5	***
Unpleasant taste/odour (24h-48h)	1.2	1.3	***
Sewage on local road	1.1	1.4	***
Pollution incident - Cat 2	0.9	1.4	***
Poor pressure (Recurring)	1.0	1.1	***
Pollution incident - Cat 3	0.9	1.3	***
Unexpected interruption (3h-6h)	1.0	1.0	
Sewage on local park	0.8	1.1	***
Odour smelt from home	0.7	1.0	***
Mains burst close to home (24h-48h)	0.7	0.7	
Discoloured water(24h-48h)	0.6	0.6	***
River water quality = Bad	0.5	0.6	***
River water quality = Poor	0.4	0.6	***
Mains burst local area (24h-48h)	0.4	0.6	***
River water quality = Moderate	0.2	0.4	***
Bathing water quality = Poor	0.3	0.3	***
Bathing water quality = Sufficient	0.2	0.2	***
Bathing water quality = Good	0.2	0.2	***
Odour smelt while travelling	0.1	0.1	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 23: Impact score by zone - households

Service issue	Impact score		t-test significance
	Central [1]	Non-central [2]	[1]=[2]
Sewage in home from under front door	16.8	19.1	
Sewage in home through plumbing	15.5	19.1	
Sewage in home under floorboards	16.1	16.9	
Sewage in home in garage/basement	9.1	7.2	**
Unsafe to drink (24h-48h)	6.4	6.2	
Unexpected interruption (24h-72h)	6.1	5.3	
Sewage in garden - difficult to access	5.1	4.3	***
Unexpected interruption (12h-24h)	4.6	3.9	**
Sewage in garden - normal access	2.5	1.9	***
Boil before drinking (24h-48h)	1.8	1.7	
Poor pressure (Permanent)	2.2	1.3	***
Pollution incident - Cat 1	1.3	1.4	
Unpleasant taste/odour (24h-48h)	1.2	1.2	
Sewage on local road	1.3	1.1	***
Pollution incident - Cat 2	1.0	1.2	***
Poor pressure (Recurring)	1.2	1.0	***
Pollution incident - Cat 3	1.0	1.0	**
Unexpected interruption (3h-6h)	1.2	0.8	***
Sewage on local park	0.9	0.9	**
Odour smelt from home	0.8	0.7	***
Mains burst close to home (24h-48h)	0.8	0.6	***
Discoloured water(24h-48h)	0.6	0.6	
River water quality = Bad	0.5	0.5	***
River water quality = Poor	0.5	0.5	
Mains burst local area (24h-48h)	0.5	0.5	***
River water quality = Moderate	0.3	0.3	***
Bathing water quality = Poor	0.3	0.3	***
Bathing water quality = Sufficient	0.2	0.2	**
Bathing water quality = Good	0.2	0.2	***
Odour smelt while travelling	0.1	0.1	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 24: Impact score by water activity - households

Service issue	Impact score		t-test significance
	Activities [1]	No activities [2]	[1]=[2]
Sewage in home from under front door	17.7	18.4	
Sewage in home through plumbing	17.3	17.6	
Sewage in home under floorboards	17.0	15.4	
Sewage in home in garage/basement	8.0	8.3	
Unsafe to drink (24h-48h)	6.3	6.4	
Unexpected interruption (24h-72h)	5.7	5.6	
Sewage in garden - difficult to access	5.0	4.1	***
Unexpected interruption (12h-24h)	4.3	4.2	
Sewage in garden - normal access	2.2	2.2	
Boil before drinking (24h-48h)	1.8	1.7	
Poor pressure (Permanent)	1.5	1.9	***
Pollution incident - Cat 1	1.5	1.1	***
Unpleasant taste/odour (24h-48h)	1.2	1.3	***
Sewage on local road	1.1	1.2	***
Pollution incident - Cat 2	1.1	1.0	***
Poor pressure (Recurring)	1.0	1.3	***
Pollution incident - Cat 3	0.9	1.2	***
Unexpected interruption (3h-6h)	1.0	1.0	
Sewage on local park	0.9	0.9	*
Odour smelt from home	0.7	1.0	***
Mains burst close to home (24h-48h)	0.7	0.7	***
Discoloured water(24h-48h)	0.5	0.7	***
River water quality = Bad	0.5	0.6	***
River water quality = Poor	0.5	0.5	***
Mains burst local area (24h-48h)	0.4	0.6	***
River water quality = Moderate	0.3	0.3	***
Bathing water quality = Poor	0.3	0.2	***
Bathing water quality = Sufficient	0.2	0.2	
Bathing water quality = Good	0.2	0.2	
Odour smelt while travelling	0.1	0.2	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 25: Impact score by vulnerability - households

Service issue	Impact score		t-test significance
	Vulnerable [1]	Non-vuln. [2]	[1]=[2]
Sewage in home from under front door	14.9	18.9	
Sewage in home through plumbing	19.1	16.8	
Sewage in home under floorboards	15.5	16.6	
Sewage in home in garage/basement	6.7	8.5	
Unsafe to drink (24h-48h)	7.5	6.0	
Unexpected interruption (24h-72h)	6.4	5.5	
Sewage in garden - difficult to access	3.1	5.2	***
Unexpected interruption (12h-24h)	5.3	4.0	*
Sewage in garden - normal access	1.9	2.3	***
Boil before drinking (24h-48h)	2.4	1.6	***
Poor pressure (Permanent)	1.7	1.6	
Pollution incident - Cat 1	1.3	1.3	
Unpleasant taste/odour (24h-48h)	1.4	1.2	***
Sewage on local road	1.6	1.1	***
Pollution incident - Cat 2	1.3	1.0	***
Poor pressure (Recurring)	1.2	1.0	***
Pollution incident - Cat 3	1.2	1.0	***
Unexpected interruption (3h-6h)	1.0	1.0	
Sewage on local park	1.0	0.8	***
Odour smelt from home	0.8	0.8	*
Mains burst close to home (24h-48h)	0.7	0.7	
Discoloured water(24h-48h)	0.7	0.6	***
River water quality = Bad	0.7	0.5	***
River water quality = Poor	0.6	0.5	***
Mains burst local area (24h-48h)	0.5	0.5	*
River water quality = Moderate	0.4	0.3	***
Bathing water quality = Poor	0.4	0.3	***
Bathing water quality = Sufficient	0.3	0.2	***
Bathing water quality = Good	0.2	0.2	***
Odour smelt while travelling	0.2	0.1	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 26: Impact score by time required for questionnaire - households

Service issue	Impact score		t-test significance
	Fast [1]	Slow [2]	[1]=[2]
Sewage in home from under front door	17.4	18.4	
Sewage in home through plumbing	15.4	19.3	
Sewage in home under floorboards	18.8	14.6	
Sewage in home in garage/basement	8.0	8.1	
Unsafe to drink (24h-48h)	6.7	5.9	
Unexpected interruption (24h-72h)	6.2	5.2	
Sewage in garden - difficult to access	4.7	4.7	
Unexpected interruption (12h-24h)	4.3	4.2	
Sewage in garden - normal access	2.5	1.9	***
Boil before drinking (24h-48h)	1.7	1.8	
Poor pressure (Permanent)	1.7	1.6	***
Pollution incident - Cat 1	1.2	1.5	***
Unpleasant taste/odour (24h-48h)	1.1	1.3	***
Sewage on local road	1.0	1.3	***
Pollution incident - Cat 2	1.1	1.1	
Poor pressure (Recurring)	1.1	1.1	
Pollution incident - Cat 3	0.8	1.2	***
Unexpected interruption (3h-6h)	1.1	0.9	***
Sewage on local park	0.8	1.0	***
Odour smelt from home	0.8	0.7	***
Mains burst close to home (24h-48h)	0.6	0.7	***
Discoloured water(24h-48h)	0.6	0.6	
River water quality = Bad	0.4	0.6	***
River water quality = Poor	0.5	0.5	***
Mains burst local area (24h-48h)	0.5	0.5	***
River water quality = Moderate	0.3	0.3	***
Bathing water quality = Poor	0.3	0.3	***
Bathing water quality = Sufficient	0.2	0.3	***
Bathing water quality = Good	0.2	0.2	***
Odour smelt while travelling	0.1	0.2	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 27: Impact scores by area – non-households

Service issue	Impact score		t-test significance
	Urban [1]	Rural [2]	[1]=[2]
Sewage in workplace through plumbing	22.0	19.1	
Sewage in workplace from under front door	19.7	13.3	
Sewage in workplace under floorboards	9.5	9.3	
Unexpected interruption (24h-72h)	7.5	9.3	
Unexpected interruption (12h-24h)	6.5	6.1	
Sewage in workplace in storage areas	6.4	6.9	
Unsafe to drink (24h-48h)	5.4	6.2	
Sewage outside workplace - difficult to access	4.4	3.8	
Unexpected interruption (3h-6h)	2.8	2.3	
Sewage outside workplace - normal access	2.6	3.7	
Boil before drinking (24h-48h)	1.7	2.5	**
Sewage on local road	1.5	1.5	
Odour smelt from home	1.1	0.8	*
Unpleasant taste/odour (24h-48h)	1.1	1.5	**
Pollution incident - Cat 2	0.8	1.1	**
Poor pressure (Recurring)	0.8	1.0	
Pollution incident - Cat 3	0.8	1.5	***
Pollution incident - Cat 1	0.7	1.5	***
Poor pressure (Permanent)	0.7	1.0	**
Sewage on local park	0.6	1.3	***
Discoloured water(24h-48h)	0.6	1.1	***
Mains burst close to home (24h-48h)	0.5	0.8	***
Mains burst local area (24h-48h)	0.5	1.3	***
Odour smelt while travelling	0.3	0.4	
River water quality = Poor	0.3	0.7	***
River water quality = Moderate	0.3	0.5	***
River water quality = Bad	0.2	0.6	***
Bathing water quality = Sufficient	0.1	0.3	***
Bathing water quality = Poor	0.1	0.3	***
Bathing water quality = Good	0.1	0.1	

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 28: Impact score by zone – non-households

Service issue	Impact score		t-test significance
	Central [1]	Non-central [2]	[1]=[2]
Sewage in workplace from under front door	23.0	14.8	
Sewage in workplace through plumbing	18.7	23.4	
Sewage in workplace under floorboards	8.8	9.6	
Unexpected interruption (24h-72h)	8.8	7.2	
Unexpected interruption (12h-24h)	7.0	5.8	
Sewage in workplace in storage areas	5.9	6.9	
Unsafe to drink (24h-48h)	5.3	5.9	
Sewage outside workplace - difficult to access	4.1	4.4	
Unexpected interruption (3h-6h)	3.1	2.3	**
Sewage outside workplace - normal access	3.0	2.8	
Boil before drinking (24h-48h)	1.8	2.0	*
Sewage on local road	1.3	1.6	***
Unpleasant taste/odour (24h-48h)	1.2	1.2	
Odour smelt from home	0.9	1.2	***
Pollution incident - Cat 2	0.8	1.0	***
Poor pressure (Permanent)	0.8	0.7	
Poor pressure (Recurring)	0.7	1.0	***
Pollution incident - Cat 3	0.7	1.1	***
Discoloured water(24h-48h)	0.6	0.8	***
Sewage on local park	0.6	0.9	***
Pollution incident - Cat 1	0.6	1.2	***
Mains burst local area (24h-48h)	0.5	0.7	***
Mains burst close to home (24h-48h)	0.5	0.6	***
Odour smelt while travelling	0.3	0.4	***
River water quality = Poor	0.3	0.5	***
River water quality = Moderate	0.3	0.5	***
River water quality = Bad	0.2	0.5	***
Bathing water quality = Poor	0.1	0.2	***
Bathing water quality = Sufficient	0.1	0.3	***
Bathing water quality = Good	0.1	0.2	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 29: Impact scores by number of employees – non-households

Service issue	Impact score			t-test significance		
	Sol. Tr. [1]	1-9 [2]	10+ [3]	[1]=[2]	[1]=[3]	[2]=[3]
Sewage in workplace from under front door	36.3	17.8	13.2			
Sewage in workplace through plumbing	20.1	23.3	15.8			
Sewage in workplace under floorboards	5.8	8.9	11.6			
Sewage in workplace in storage areas	5.4	6.3	7.2			
Unsafe to drink (24h-48h)	4.1	5.7	5.8			
Sewage outside workplace - difficult to access	3.2	4.0	5.7		**	
Unexpected interruption (24h-72h)	3.2	7.9	11.2			
Sewage outside workplace - normal access	2.7	3.0	2.3			*
Boil before drinking (24h-48h)	2.6	1.8	1.6			
Unexpected interruption (12h-24h)	2.5	6.5	8.8	***	***	
Sewage on local road	1.3	1.5	1.3			**
Sewage on local park	1.3	0.7	0.5	***	***	***
Unexpected interruption (3h-6h)	1.3	2.3	5.8	***	***	**
Odour smelt from home	1.2	1.0	1.0	*		
Pollution incident - Cat 3	1.1	1.0	0.6		***	***
Pollution incident - Cat 1	0.9	0.9	0.7		*	***
Unpleasant taste/odour (24h-48h)	0.9	1.2	1.2	**	***	
Pollution incident - Cat 2	0.8	0.9	0.9			
River water quality = Poor	0.7	0.4	0.2	***	***	***
Discoloured water(24h-48h)	0.7	0.7	0.8		*	***
Mains burst local area (24h-48h)	0.5	0.6	0.5	*		***
River water quality = Moderate	0.5	0.4	0.3	***	***	***
Poor pressure (Recurring)	0.5	0.9	1.0	***	***	
Mains burst close to home (24h-48h)	0.5	0.5	0.5	*		**
Poor pressure (Permanent)	0.5	0.7	0.9	***	***	**
River water quality = Bad	0.5	0.3	0.2	***	***	***
Odour smelt while travelling	0.4	0.4	0.3	**	***	***
Bathing water quality = Poor	0.3	0.2	0.1	***	***	***
Bathing water quality = Sufficient	0.2	0.2	0.1	***	***	***
Bathing water quality = Good	0.1	0.1	0.1	***		***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 30: Impact score by number of branches – non-households

Service issue	Impact score			t-test significance		
	1 [1]	2-3 [2]	4+ [3]	[1]=[2]	[1]=[3]	[2]=[3]
Sewage in workplace through plumbing	20.8	20.2	23.0			
Sewage in workplace from under front door	18.6	15.2	17.3			
Sewage in workplace under floorboards	8.3	12.1	12.3			
Unexpected interruption (24h-72h)	7.4	10.3	8.0			
Unexpected interruption (12h-24h)	7.2	5.5	4.1		**	
Sewage in workplace in storage areas	6.8	5.1	6.9			
Unsafe to drink (24h-48h)	6.2	5.8	3.6		*	
Sewage outside workplace - difficult to access	4.0	4.5	5.4			
Sewage outside workplace - normal access	2.7	2.8	4.5		*	
Unexpected interruption (3h-6h)	2.6	2.1	4.1			
Boil before drinking (24h-48h)	2.2	2.1	1.0		***	***
Sewage on local road	1.5	1.5	1.3		**	
Unpleasant taste/odour (24h-48h)	1.4	0.9	0.7	***	***	
Odour smelt from home	1.2	1.5	0.5		***	***
Pollution incident - Cat 3	1.0	1.2	0.6		***	***
Pollution incident - Cat 2	0.9	1.2	0.8	**	***	***
Poor pressure (Permanent)	0.9	0.6	0.5	***	***	***
Poor pressure (Recurring)	0.9	1.2	0.9	*		
Pollution incident - Cat 1	0.8	1.2	0.9	*		
Sewage on local park	0.8	0.8	0.6		***	***
Discoloured water(24h-48h)	0.8	0.7	0.4	**	***	***
Mains burst local area (24h-48h)	0.6	0.7	0.8		**	
Mains burst close to home (24h-48h)	0.5	0.6	0.7		***	**
River water quality = Poor	0.5	0.3	0.2	***	***	***
Odour smelt while travelling	0.4	0.4	0.2	**	***	***
River water quality = Moderate	0.4	0.5	0.4	***		***
River water quality = Bad	0.3	0.4	0.2	***	***	***
Bathing water quality = Sufficient	0.2	0.1	0.1	***	***	***
Bathing water quality = Poor	0.2	0.2	0.1	**	***	***
Bathing water quality = Good	0.1	0.2	0.1	***	***	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 31: Impact score by dependency on water supply – non-households

Service issue	Impact score		t-test significance
	Dependent [1]	Not-depend. [2]	[1] = [2]
Sewage in workplace through plumbing	19.2	23.3	
Sewage in workplace from under front door	16.3	18.5	
Unexpected interruption (24h-72h)	13.0	5.6	*
Unexpected interruption (12h-24h)	8.8	4.8	**
Sewage in workplace under floorboards	8.8	9.5	
Unsafe to drink (24h-48h)	6.0	5.2	
Sewage in workplace in storage areas	5.7	7.0	
Sewage outside workplace - difficult to access	3.5	4.8	***
Unexpected interruption (3h-6h)	3.2	2.2	***
Sewage outside workplace - normal access	2.4	3.3	***
Boil before drinking (24h-48h)	1.8	2.0	
Poor pressure (Recurring)	1.2	0.7	***
Unpleasant taste/odour (24h-48h)	1.1	1.2	
Sewage on local road	1.1	1.8	***
Poor pressure (Permanent)	1.0	0.6	***
Odour smelt from home	0.9	1.1	***
Pollution incident - Cat 2	0.8	1.0	***
Pollution incident - Cat 3	0.7	1.2	***
Discoloured water(24h-48h)	0.7	0.7	
Sewage on local park	0.7	0.8	***
Pollution incident - Cat 1	0.6	1.1	***
Mains burst local area (24h-48h)	0.5	0.7	***
Mains burst close to home (24h-48h)	0.4	0.7	***
Odour smelt while travelling	0.3	0.4	***
River water quality = Poor	0.3	0.5	***
River water quality = Moderate	0.3	0.5	***
River water quality = Bad	0.2	0.4	***
Bathing water quality = Sufficient	0.2	0.2	***
Bathing water quality = Poor	0.1	0.2	***
Bathing water quality = Good	0.1	0.2	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 32: Impact score by bill size – non-households

Service issue	Impact score			t-test significance		
	Small [1]	Med. [2]	Large [3]	[1]=[2]	[1]=[3]	[2]=[3]
Sewage in workplace through plumbing	20.9	21.8	12.5			
Sewage in workplace from under front door	18.9	13.8	9.2			
Sewage in workplace under floorboards	10.4	8.6	19.8			
Unexpected interruption (24h-72h)	6.2	10.3	27.3			
Unsafe to drink (24h-48h)	5.9	7.0	2.1		**	**
Sewage in workplace in storage areas	5.8	6.8	7.6			
Unexpected interruption (12h-24h)	5.5	8.9	3.6			
Sewage outside workplace - difficult to access	4.5	4.3	2.4			
Sewage outside workplace - normal access	3.2	2.5	2.1	*		
Boil before drinking (24h-48h)	2.7	1.9	1.0	***	***	***
Unexpected interruption (3h-6h)	1.9	3.0	6.6	**		
Sewage on local road	1.7	1.3	0.3	***	***	***
Unpleasant taste/odour (24h-48h)	1.4	1.1	0.4	***	***	***
Pollution incident - Cat 3	1.3	0.6	0.2	***	***	***
Odour smelt from home	1.2	0.8	0.8	***		
Pollution incident - Cat 1	1.2	0.6	0.3	***	***	***
Sewage on local park	1.0	0.6	0.2	***	***	***
Pollution incident - Cat 2	0.8	0.9	0.5			
Poor pressure (Recurring)	0.8	1.0	0.9	***		
Poor pressure (Permanent)	0.8	0.7	0.6			
Discoloured water(24h-48h)	0.7	0.7	0.3		***	***
Mains burst local area (24h-48h)	0.6	0.7	0.1		***	***
Mains burst close to home (24h-48h)	0.6	0.6	0.1		***	***
River water quality = Poor	0.6	0.2	0.1	***	***	***
Odour smelt while travelling	0.4	0.3	0.2	***	***	***
River water quality = Moderate	0.3	0.3	0.3	***		
River water quality = Bad	0.3	0.3	0.1		***	***
Bathing water quality = Poor	0.2	0.1	0.0	***	***	***
Bathing water quality = Sufficient	0.2	0.1	0.1	***	***	**
Bathing water quality = Good	0.1	0.1	0.0	***	***	***

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 33: Impact score by industry - non-households

Service issue	Impact score												
	Agric ¹	Manuf. ²	Constr. ³	Mot. Tr ⁴	Retail ⁵	Accom. ⁶	Comm. ⁷	Finance ⁸	Science ⁹	B. Adm. ¹⁰	Health ¹¹	Art ¹²	Others ¹³
Sewage in workplace through plumbing	17.8	33.7	14.3	3.8	14.7	25.5	13.1	17.4	27.6	14.8	25.9	25.9	9.0
Sewage in workplace from under front door	12.1	9.0	10.2	31.1	24.6	15.5	18.6	14.7	12.9	49.5	9.1	22.2	1.6
Unexpected interruption (12h-24h)	10.1	3.2	6.8	6.0	5.2	8.5	2.7	3.9	4.2	3.1	7.7	6.6	5.0
Sewage in workplace under floorboards	8.4	2.3	12.3	6.5	6.3	8.1	13.7	37.4	12.5	6.7	10.5	7.9	3.2
Unexpected interruption (24h-72h)	7.3	4.0	4.4	13.4	8.6	11.3	9.3	7.8	7.3	5.1	7.3	9.9	27.5
Unsafe to drink (24h-48h)	5.7	6.9	11.0	6.4	4.8	7.1	3.6	2.0	4.1	6.3	6.6	3.2	0.8
Pollution incident - Cat 1	5.5	1.0	1.9	1.0	1.3	0.5	0.3	0.6	0.9	0.4	0.9	0.7	0.5
Sewage in workplace in storage areas	5.1	16.8	6.8	4.3	6.9	3.5	21.4	6.4	6.2	4.3	8.2	5.1	29.4
Pollution incident - Cat 2	3.8	1.2	1.4	1.0	1.1	0.7	0.6	0.3	1.1	0.2	0.6	0.6	0.9
Sewage outside workplace - normal access	3.2	1.5	4.1	3.0	3.3	1.6	1.5	2.4	2.5	2.0	3.9	1.3	5.9
Boil before drinking (24h-48h)	2.6	1.3	2.9	1.1	2.0	2.1	2.8	0.9	2.3	0.8	1.4	1.8	-1.5
Sewage outside workplace - difficult to access	2.3	4.1	6.3	5.8	5.4	2.0	2.6	0.9	4.1	1.7	3.6	2.5	1.7
Unpleasant taste/odour (24h-48h)	2.3	1.1	1.3	0.8	1.2	1.9	1.0	0.5	1.2	0.4	1.1	1.3	0.3
Sewage on local road	2.0	1.8	1.6	1.6	2.1	0.9	1.3	0.8	0.9	0.9	1.6	1.0	0.6
Unexpected interruption (3h-6h)	1.3	1.3	2.5	3.7	2.0	2.7	2.1	0.7	4.0	0.6	3.2	3.1	4.6
River water quality = Bad	1.2	0.3	0.6	0.5	0.5	0.3	0.2	0.1	0.3	0.1	0.3	0.1	0.3
Pollution incident - Cat 3	1.0	1.1	1.5	1.8	1.1	0.4	0.6	0.3	0.6	0.3	0.8	0.8	0.1
River water quality = Moderate	1.0	0.7	0.6	0.2	0.6	0.3	0.1	0.0	0.5	0.1	0.4	0.3	0.5
Sewage on local park	1.0	1.0	1.1	0.5	0.9	0.7	0.4	0.2	0.9	0.4	1.1	0.4	0.4
Mains burst close to home (24h-48h)	0.9	1.6	0.9	1.0	0.5	0.4	0.2	0.3	0.7	0.2	0.6	0.5	0.4
Poor pressure (Permanent)	0.9	0.9	0.8	1.4	0.7	1.3	0.3	0.5	0.5	0.2	1.0	1.3	0.5
Odour smelt from home	0.8	0.9	0.9	0.9	1.8	0.9	1.0	0.3	0.9	0.5	0.8	0.9	0.2
Mains burst local area (24h-48h)	0.7	0.5	1.3	0.7	0.7	0.5	0.5	0.2	1.0	0.2	0.4	0.5	0.3
River water quality = Poor	0.7	0.7	0.6	0.4	0.6	0.3	0.3	0.1	0.4	0.1	0.5	0.3	0.3
Discoloured water(24h-48h)	0.6	0.8	1.2	0.7	0.8	0.8	0.8	0.3	0.7	0.3	0.6	0.6	0.4
Bathing water quality = Good	0.5	0.2	0.3	0.2	0.3	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.2
Poor pressure (Recurring)	0.5	0.9	1.1	1.6	1.0	1.3	0.6	0.4	0.6	0.3	1.1	0.9	0.5
Bathing water quality = Sufficient	0.4	0.3	0.4	0.2	0.3	0.2	0.0	0.1	0.3	0.1	0.2	0.1	0.1
Odour smelt while travelling	0.2	0.5	0.5	0.4	0.6	0.4	0.1	0.3	0.3	0.1	0.3	0.3	3.7
Bathing water quality = Poor	0.2	0.4	0.4	0.1	0.3	0.2	0.2	0.1	0.3	0.1	0.1	0.1	0.1

Experience Analysis

The analysis of experience focuses on the effect of respondents' past experience of service failure on the relative impact they assigned to the corresponding service issue in comparison to the others, as captured by the MaxDiff models. To this end, an indicator variable was constructed for each service issue that equalled 1 if the respondent experienced a failure in it any time in the past, and 0 otherwise. These indicator variables were interacted with their corresponding MaxDiff service issues in order to identify the effect in question. The rank-ordered logit model was therefore extended to estimate for each service measure a base coefficient representing relative impact under no experience, and an interaction term representing the change in relative impact with experience.

In most cases, our analysis found that Impact scores did not depend significantly on experience of the service issue in question. The exceptions to this rule are presented below in Table 34. Thus, customers who experienced mains bursts close to their home scored the issue more highly than those without similar experience. Likewise, customers who experienced Bad river water quality also scored this issue more highly than those without similar experience. For all other service measures, however, there was no evidence of a statistically significant effect of experience on Impact scores.

Table 34: Impact scores by experience - households

Service issue	No Experience	Experience	Significance of interaction effect
Mains burst close to home	0.7	1.2	**
River water quality = Bad	0.5	0.9	**

*Significant at 10% level / **Significant at 5% level / Significant at 1% level