Drainage and Wastewater Management Plan reports

Qualitative findings, September 2021

Quantitative findings, November 2021 (summary slides)

Quantitative findings, January 2022 (full report)

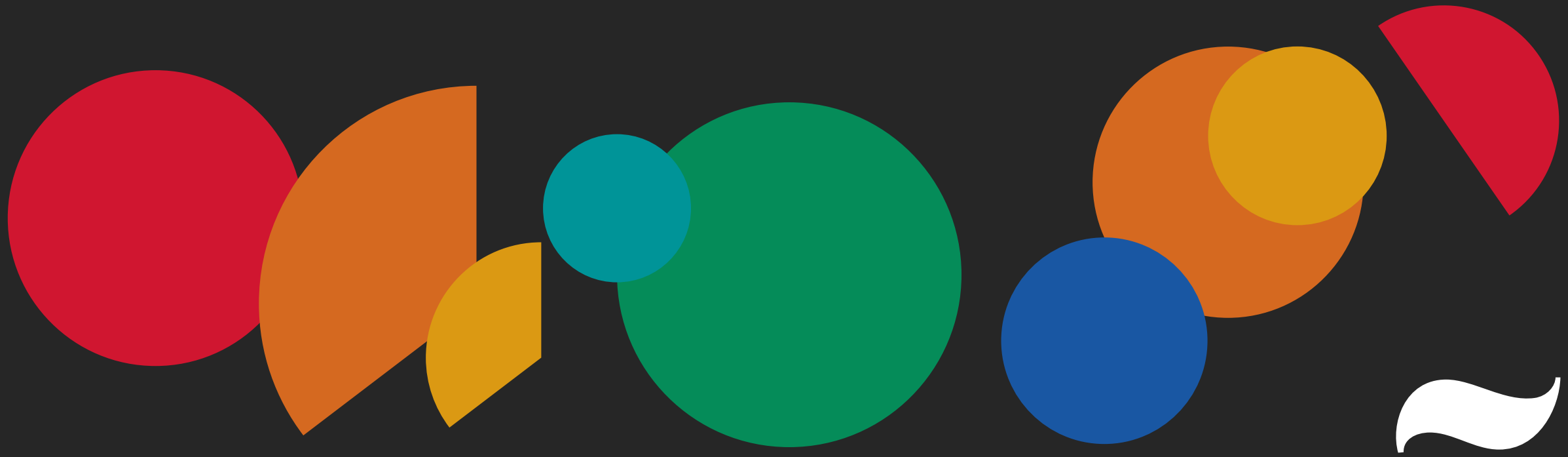
How this research met Ofwat's high quality research principles

Business plan 2025-2030

Wessex Water
YTL GROUP

FOR YOU. FOR LIFE.

Accent PJM economics



Drainage and Wastewater Management Plan Research: Qualitative Findings

Accent, Tel +44 (0)20 8742 2211,
September 2021
3500

BACKGROUND & CHALLENGES

Wessex Water is creating:

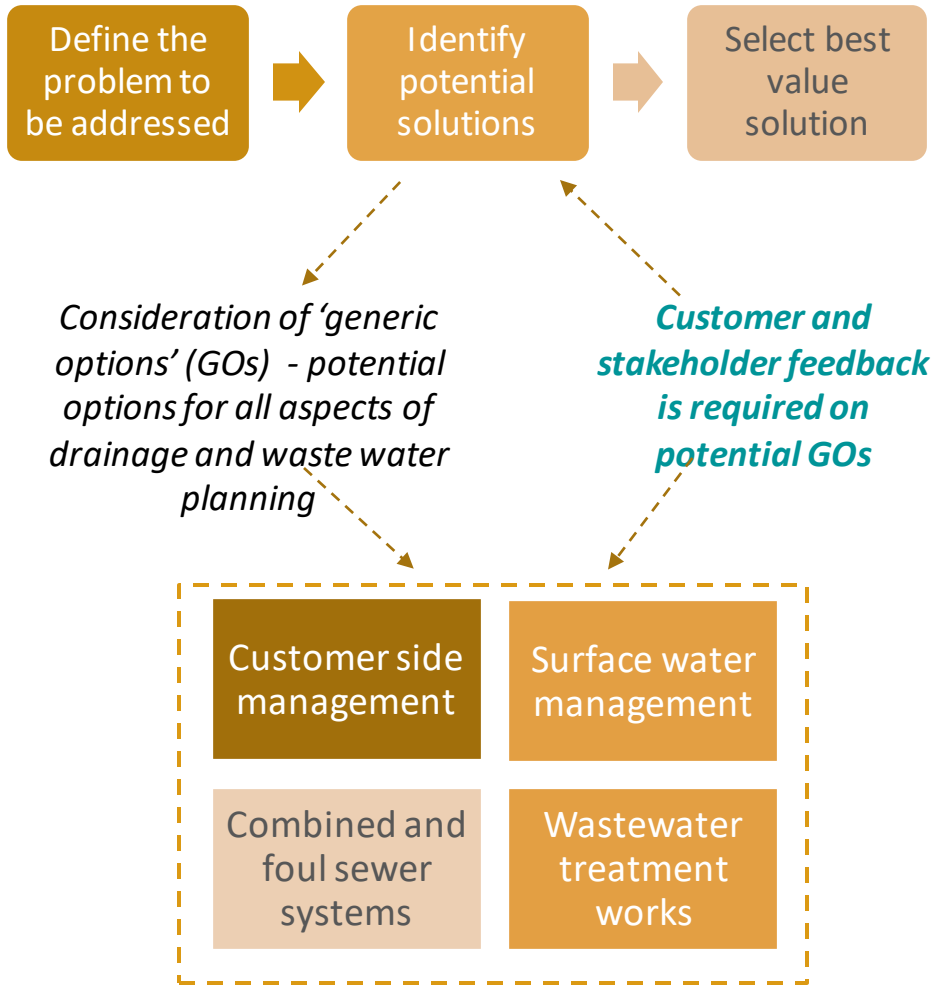
- A company-wide drainage and wastewater management plan (DWMP)
- Drainage and wastewater management catchment plans for Bristol Avon, Dorset, Hampshire Avon and Somerset strategic catchment partnerships
- Local drainage and wastewater strategies for water recycling centres catchments with existing or future risks.

Drainage and Wastewater Management Plans (DWMP)

- Introduced in 2019
- A move towards a more consistent basis for long-term planning of drainage and wastewater services
- A number of organisations collaborate to create a 25 year strategic plan to improve drainage and environmental water quality
- Wessex Water seeks to integrate customers views
- Plans developed by DWMP also feed into Wessex Waters PR24 business plan

Customer and stakeholder input in the water and wastewater industry is crucial. Decisions made now can impact the service provided to customers and the environment for generations to come.

The process of developing DWMP



APPROACH OVERVIEW

Iterative phases of research creating depth of insight

1. **Immersive Review and Inception Meeting** – Recap of results to date from SDS study

2. **Expert Co-creation** – The **expert panel** created for the SDS project will meet to discuss WDMP, feedback on GOs and how to convey them to customers

3. **Qualitative discovery**
   Perceptions of wastewater, drainage and reactions to GOs (especially behavioural focussed). Tailored engagement channels to reach different audiences, with an opportunity to draw learnings from each phase and make refinements for subsequent engagement. A unique focus for each audience according to their degree of specialism.

   - a) Retailer depths (reconvened)
   - b) Online workshop with business customers (reconvened)
   - c) Online consumer Zoom groups (reconvened)
   - d) Tele depths with vulnerable customers
   - e) Zoom depth interviews with customers who have experienced sewer flooding/waste water issue (affected but uninformed)

4. **Quantification –** – Online and face to face surveys with customers (HH and NHH)
   Two interlinked surveys:
   A) Acceptability of Impact and support for GO options
   B) WTP for alternative GO's, Impact of bill alternative options, When Wessex Water should invest

5. **Final refinements – expert panel reconvened to debate research findings and suggested actions**

6. **Action Planning Workshop to disseminate results**

DETAILED METHODOLOGY AND SAMPLE:

Households: Ten online reconvened workshops; six depth interviews with customers in vulnerable situations: five depth interviews with flood incident experiencers. Home-work exercises via LiveMinds platform

All participants (with the exception of those who had experienced a flooding incident) reconvened from the SDS work

Online groups reconvened	Location	Customer Type		
1	Bournemouth	Future Customers	25-55	55+
2	Bristol			
3	Taunton			
4	Salisbury			

No of depth Interviews	Location	Customers in Vulnerable Situations
6	Bath, Bristol, Cheddar	Literacy issue, long-term health problem, 75+, learning difficulty, unemployed

No of depth Interviews	Location	Customers who have experienced a flooding issue
5	Wessex	Mix of sewer flooding and wastewater, internal/external, single and multiple incidents

DETAILED METHODOLOGY:

NHH online workshop

NHH Workshop

- Sectors include:
  - Manufacturing, Construction, Hospitality, Events, Catering
- Water usage is largely unconscious and using what is needed for business to function:
  - Drinking
  - Food preparation
  - Cleaning
  - Flushing
  - Car/van washing
  - Washing/bathing

Mix of fresh recruit and reconvened SDS participants

Feedback from all strands included with differences referenced

BACKGROUND MATERIALS SHARED:

Explanation of DWM terminology and background on DWMP to ensure base level of knowledge

Showcard 1

Recap on the basics

- The water you use to clean your teeth, shower and bath and to flush the toilet becomes sewage – Wessex Water treats 480 million litres of it every day.
- Other sewage they treat includes rainwater from roads, roofs and gardens as well as industrial effluent – mainly liquid organic waste from industries such as food factories and diary product manufacturers.
- Wessex Water has invested hundreds of millions of pounds to improve sewage treatment and over the past five years their treatment works have regularly achieved more than 99.9% compliance with environmental standards.
- Almost all sewage is organic which is why water recycling centres (sewage treatment works) use natural, organic processes.
- The sewage goes through the following processes:
  - debris, rags and large objects, are removed using screens
  - sewage flows into tanks where the solids sink to the bottom and are removed as sludge
  - the sewage is treated biologically - the liquid passes through media with bacteria growing on them, such as filters of stone or plastic. The bacteria feeds off the waste, helping to clean the water.
- Another form of biological treatment they use is the activated sludge process. Bacteria are mixed with the waste in large tanks using equipment which either blows or beats air into the mixture.

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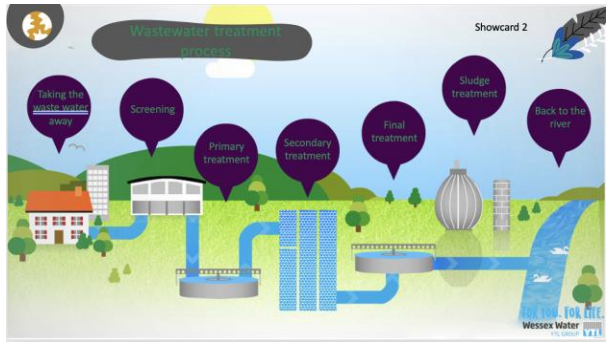

Showcard 3

Recap on the basics

- The collection and treatment of domestic sewage and wastewater is vital to public health and clean water
- River catchment areas: the area of land from where surface water flows into the river
- Surface water: when rain from heavy rain collects on land and overwhelms drains etc, causing disruption
- Groundwater: when the level of water within the rock or soil underground (known as the water table) rises and reaches ground level, water starts to seep through to the surface and flooding can happen
- Groundwater flooding is much slower to occur than river flooding – it will usually happen days, weeks or even months after heavy or prolonged rainfall. And it may last weeks or even months.
- Sewers collect sewage and wastewater from homes, businesses, and industries and deliver it to wastewater treatment facilities
- In a combined sewer system all the wastewater and surface water goes into one pipe. This pipe takes everything to a sewage treatment works for processing
- Sewer flooding is when sewage or foul water leaks from the sewerage system (through pipes, drains or manholes). Sewer flooding can be caused by a number of factors, including pipe blockages and heavy rainfall.

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Showcard 4

Introduction to DWMP

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Drainage and Wastewater Management Plans (DWMP)

- Introduced in 2019, the draft DWMP will be published in Summer 2022.
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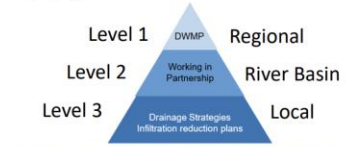
Showcard 5

DWMP progress (1)

- Significant stakeholder engagement and reporting at various levels



1. WRFCC = Wessex Regional Floods and Coastal Committee
2. LLFA = Partnerships / Lead Local Flood Authority (councils)
3. Local = The catchment of a treatment works (aka WRC)

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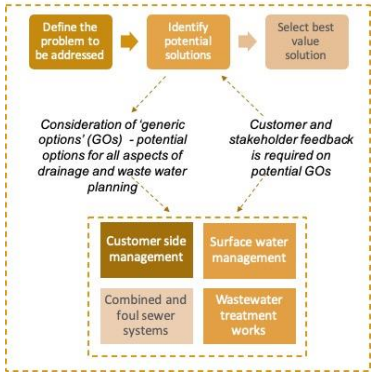
Showcard 7

DWMP progress (2)

- Hundreds of meetings during 2019-20-21
- Annual Stakeholder workshops (March 2020 and 2021) identified 57 priority locations



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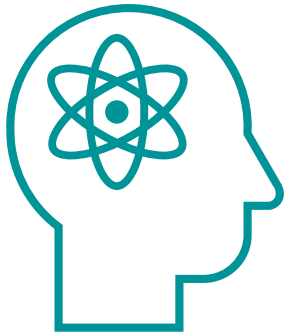
What do customers think about Drainage and Wastewater?

STARTING KNOWLEDGE AND UNDERSTANDING OF DRAINAGE AND WASTEWATER IS GENERALLY LOW AMONG THOSE WITH NO EXPERIENCE OF ISSUES: Drainage challenges feel remote and not a domestic issue

- Limited understanding of terminology: 'surface water' 'groundwater', 'combined sewage' etc
- Initially feels detached from their daily water usage
- No initial link made to customer behaviour
- Most admit to not having considered what happens to surface water
  - and little thought to the sewage treatment process
- Awareness of issues is low: no real spontaneous reference to river water pollution etc
- Higher among those living near treatment works or aware of local drain/sewer flooding
- Micro challenges initially assumed to be a 'Wessex Water problem' rather than under customers' control:
  - Infrastructure/maintenance issues
  - OR affecting those deciding to leave near a flood risk area
- On prompting, some recalled stories around sewer blockages from fatbergs, wet wipes etc on news, social media



"I must admit I have never even thought about how all this stuff works before. I feel a bit stupid because I don't really know much about it at all and this all feels quite technical"

Bournemouth, 55+

"I had no idea that the rain and surface run-off goes in with all the sewage, but I suppose that makes sense now I think about it"

Bristol, 25-55

I've seen some stuff about fatbergs and not flushing things down the toilet, like wipes"

Taunton, Future

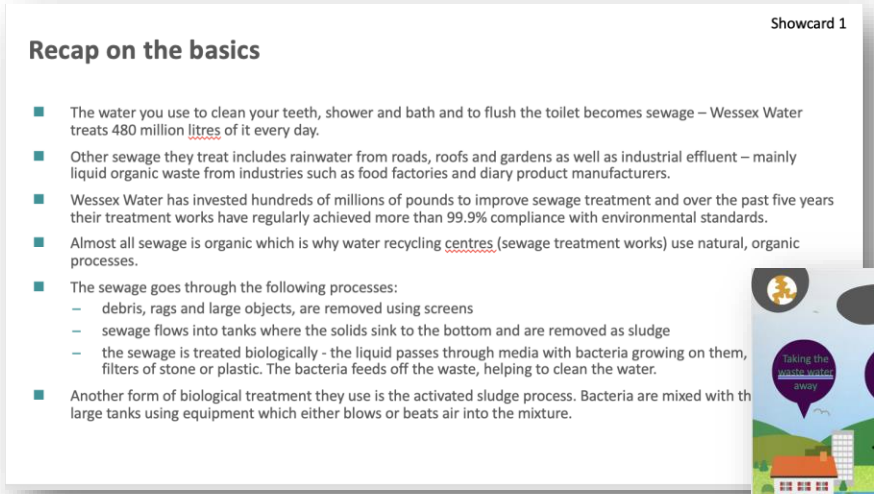
Implications for quantitative stage:

Challenges around Drainage and Wastewater are not top of mind and taken as read – with no obvious link to customer behaviour

Nature and causes of incidents may need to be highlighted/illustrated

DETAILED EXPLANATION OF PROCESS AND TERMINOLOGY HELPS TO SECURE CUSTOMER ENGAGEMENT IN THE DISCUSSION

Relationship between surface water, ground water and sewage is required to explain challenges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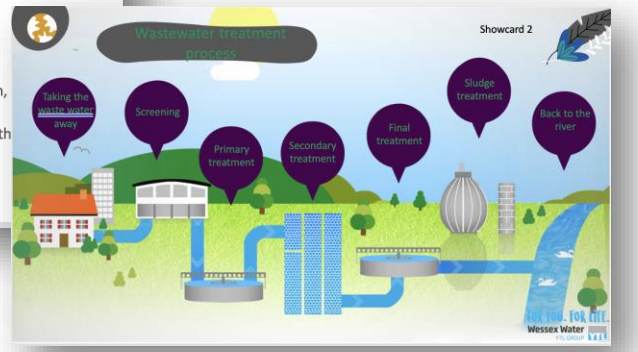


- Detailed explanation of process and terminology feels necessary
- Not all are familiar with 'surface water' and 'groundwater'
- Areas of interest/surprise were:
  - Treatment is an organic process
  - High number of litres processed per day
  - Numerous steps involved in treatment process
  - Surface and sewage water are combined in system
- Some wanted information on number of incidents per year

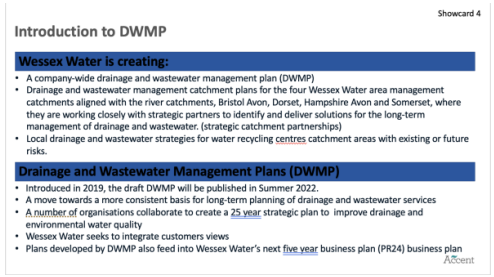
> *"I like the idea that this is all organic: I would never have realised that"*
>
> ***Salisbury, Future***

> *"When we talk about drains getting overwhelmed are we just talking about incidents when there is extreme weather, or is it more than that? "*
>
> ***NHH***

Implications for quantitative stage:
Background information with diagrams and visuals may increase engagement

WESSEX WATER'S DWMP….

Macro and Micro DWM challenges giving rise to the plan may need highlighting to customers with limited awareness/direct experience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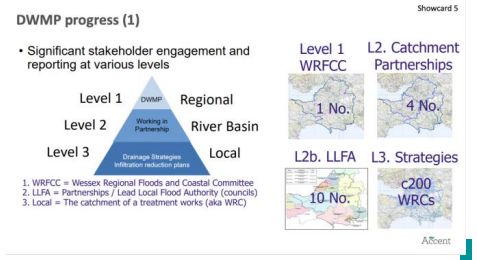
Showcard 5

DWMP progress (1)

- Significant stakeholder engagement and reporting at various levels

Level 1 — Regional
Level 2 — River Basin
Level 3 — Local

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3. Local = The catchment of a treatment works (aka WRC)

Level 1 WRFCC: 1 No.
L2. Catchment Partnerships: 4 No.
L2b. LLFA: 10 No.
L3. Strategies: c200 WRCs

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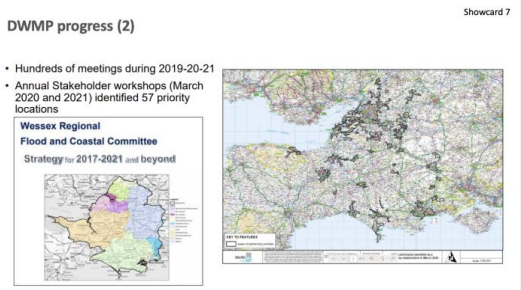
Showcard 7

DWMP progress (2)

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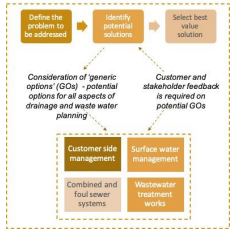
- Annual Stakeholder workshops (March 2020 and 2021) identified 57 priority locations

Wessex Regional Flood and Coastal Committee Strategy for 2017-2021 and beyond



- Consistent long-term approach and involvement of partners is received positively, though some struggle with the terminology on these slides: abbreviations, 'stakeholder engagement', 'Catchment Partnerships'
- Some surprise at implication that no long-term plan exists now
- Initially difficult for most participants to comprehend how they could add meaningful input to the plan
- Once initially prompted most were able to identify the **macro challenges** for WW going forward, even if unaware of current incidents in their area
- Customer behaviour is not usually listed as a cause of issues

> *I'm not sure why they are asking us to tell them how to do their job. Surely they have looked into all of this before*
>
> ***NHH***

- 'Over' development (especially in 'my area')
- Population growth
- Climate change and unusual weather
- Old (Victorian?) pipes and equipment

Implications for engagement: Communication needs to outline the growing challenges around DWMP in this area and the potential impact on costs and the local environment

THOSE WHO HAVE EXPERIENCED ISSUES ARE MORE AWARE OF AND CONCERNED ABOUT LIKELY CAUSES

PERCEIVED CAUSES

Climate/natural environment:

- Extreme weather
- Too much silt in rivers stopping flow of water

Population/development growth:

- New builds and accompanying infrastructure stopping
- natural flow of water to sea
- Too many new properties in the area (insufficient infrastructure)
- Building houses on flood plains/farm land

Infrastructure :

- Old infrastructure that doesn't have the capacity to deal with wastewater
- Old pipes on property not recorded or dealt with by WW
- Infrastructure too old to deal with demand
- Old manhole that does not allow water to drain properly

Customer actions:

- Blocked drain on street – mix of people flushing wrong items and lack of regular maintenance
- Lack of education about wet wipes, fat in drains etc

> *"Bristol is full of old Victorian drains. Ideally they would replace them, but I imagine there are bigger issues for them to deal with than making sure my drain doesn't get blocked"*

EMOTIONAL IMPACT

- *"I couldn't eat for a couple of days and I didn't feel clean"*
- *"I'm paranoid about it happening again"*
- *"It was such a nuisance – I couldn't do anything until it was dealt with"*
- *"It was really traumatic"*
- *"We were told to keep away from the cellar because it was a health hazard"*
- *" I felt like nobody cared, because it was on the street outside the house and it smelled awful"*

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EXPERIENCES OF WW HANDLING OF INCIDENTS IS MIXED

Sometimes happy with the initial response, but unsure how much of a priority for WW

Quick initial response from engineers and **pleasant customer service staff** (when able to get through)

Mixed views on thoroughness of initial checks – not always a proper investigation of cause, suggestion that probably the customer's problem rather than WW; lack of communication from WW to engineer

Unsure who to contact if told not a WW problem: time and money spent looking for someone to deal with it: not a 'regular plumber problem'

One customer happy that WW took responsibility when information from third party (Alpha Rod) was passed on

- **Perceived lack of empathy from WW when follow-up action was required**
  - Help towards cost of replacing kitchen lino took an amount of 'pestering' and was a very low sum
  - Installation of non-return valve still hasn't happened
  - No remedial action yet once initial blockage was removed – even when promised

"Obviously I had to clean it straight away and because it was clean they said they didn't need to do anything about the problem. I wasn't going to leave sewage on the kitchen floor"

"Alpha rod did a report for Wessex Water and I was impressed that Wessex Water then contacted me to take responsibility and refunded the money I had to spend"

"They put a yellow mark on the road, so I imagine they intend to do something eventually to make sure it doesn't happen again, but I would rather it had been properly sorted out"

For experiencers, the likelihood of incidents feels higher and investment in reducing the risk therefore is more of a priority

CUSTOMER CHANGE AS A RESULT OF INCIDENTS OFTEN DEPENDS ON THE SPECIFIC CAUSE

Not always linked to wider customer awareness or larger scale investments

Behavioural change is more about reducing likelihood of another incident in their property

- Checking manholes more often
- Looking out for signs of flooding during bad weather
- Replaced lino with tiles to prevent further seeping
- Flushing toilet less often to prevent overwhelming own drain
- Avoiding use of cellar, storing items elsewhere

Do not always link their own experience to wider customer behaviour in relation to water efficiency

- Though sometimes feel better education around sewage and potential blockage incidents is necessary

Mixed views on acceptability and effectiveness of storm overflows, depending on their local area and environmental attitude

- General trust issue for some with regard to pollution, even when they feel these are an important safeguard against flooding

> "I check the manhole every week now. I would rather they replace it, as I don't think it's fit for purpose, but all I can do is keep checking the levels"

> "I now keep all my valuables on the top floor of my property, because it's listed and I can't do much to it to make sure it doesn't happen again"

> "There was an issue with storm drains when I lived in Poland and they were fined for over-use. I think we still need them to avoid other people experiencing what I did, but they must be monitored carefully"

Past experience of incidents sometimes impacts on priorities for GOs – emphasis is often on spending money to ensure properties are not affected

Pre-weighted reactions to General Options

Option name	Detail
Control measures	These are options that are designed to deal with heavy rain water as close to the source as possible. For example, building soakaways at the side of roads so that rain water would be diverted into these soakaways rather than entering the sewer system and/or causing flooding on the road. These would include opportunities for large-scale source control installations such as retrofitting in highways and around existing buildings, as well as aligning with ongoing programmes like local authority highway upgrades or major opportunity area developments. This offers the benefits of reduced flood risk and improved water quality.
Pathway measures	These are options that are designed to divert heavy rain away from roads and buildings and onto land that can cope with flooding (such as parkland or other open land). This could significantly mitigate the risk of considerable damage to public and private property.
Separate flows	This would involve developing separate networks for surface water and foul water (the waste from homes and businesses) by constructing new surface water networks. Currently in a combined sewer system all the wastewater and surface water goes into one pipe. This pipe takes everything to a sewage treatment works for processing. During heavy periods of rain the sewer network can become overwhelmed which increases the risk of road, property or treatment works flooding
Mitigation	This would involve keeping floodwater away from buildings and strategic infrastructure (such as electricity sub stations) in the event of a storm. This would include property level protection such as floodgates as properties

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SURFACE WATER MANAGEMENT:

Control measures and pathway measures are often selected as most effective with least disruption. And have the potential to enhance the natural environment

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CONTROL MEASURES 1

- Often selected as favoured option here
- Containing water at source makes sense
- 'Improved water quality' has great appeal
- Some existing/older customers were familiar with 'soakaways'
- Involvement of construction co, local authorities, highways etc spreads responsibility and cost
- BUT could be disruptive/expensive, especially if retrofitting

PATHWAY MEASURES 2

- Some selected this as a 'natural' solution
- Others raised environmental concerns – flooded/ruined land with potentially polluted water
  - Waste of water that could be reused
  - Use of 'parkland' can prompt negative reactions
- Question how effective this could be in each area – how much of this land exists and where?

SEPARATE FLOWS 3

- Mixed reactions
- Makes sense to avoid overwhelming sewers
- No need to contaminate 'cleaner' water and put it through the same process – saves energy
- Feels like a longer term, higher cost option
- Prompts questions:
  - Where would the surface water go to?
  - What cost/disruption of building a new network?
  - Could the surface water be used/recycled?

MITIGATION 4

- Least often selected, though of interest to those living in a flood risk area
- Avoiding floods to electricity sub station is vital

BUT

- Unsure as to the scope of the benefits – which/whose buildings?
- Would this cause a problem elsewhere? For those who cannot afford their own defences?

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I'm not sure I really understand what the pathway measures are about

I don't like the idea of flooding parkland with the excess water

my last choice would be the pathway measures as this is just moving the problem elsewhere

Mitigation seems like damage limitation rather than future planning.

Control measures seems the most progressive option as it can be installed in new developments as well as flood risk areas.

Separate flows - this seems a good way to save energy as not all water needs treating like sewage.

SURFACE WATER MANAGEMENT

I like the option of separate flows as this would help deal with Heavy rain periods especially as our weather seems to be heading towards warmer climates so inducing more rainfall and of course much heavier rainfall.

Least favourite option is Mitigation as the roads would still get flooded and disrupt transport.. Long term with climate change increasing the severity of the weather this is like a sticking plaster, ie a short term solution.

COMBINED AND FOUL WATER SYSTEMS

While improved storage and dynamic operation appeal, improvements to existing network are assumed to be ongoing and part of the Wessex Water's core responsibilities

Option name	Detail
Intelligent network operation (smart network)	Controlling the flow movement in reaction to the current situation. Allows the system to be operated proactively, maximising the use of existing assets (sewer pipes, treatment works, etc). These options cover a range of different approaches e.g. modifying the start-stop levels at strategic pumping stations, creation of new network control points which allow for flow to be temporarily held back in the catchment. This would allow for flow of foul and surface water throughout the network to ease the amount of water in the system during heavy periods. Note: A pumping station is an intermediate storage/collecting chamber which transfers either the foul or surface water to a local drain, manhole, or sewer
increase capacity of existing foul/combined networks	Replace existing sewer with a large diameter sewer to increase capacity
Wastewater transfers	The movement of sewer flow to another area within the Wessex area, or company
Sewer rehab	Sewer rehabilitation (updating) to improve the equipment and prevent collapses/blockages
Reduction of sewer groundwater infiltration	Infiltration is groundwater that enters sewer pipes through cracks, leaky pipe joints, connection failures and deteriorated manhole covers. Infiltration amounts vary by season and in response to groundwater levels. This would see these cracks, leaky pipe joints, etc repaired/sealed
Property Level Resilience	Protecting properties by use of non-return valves, pumps, flood gates etc. Drains can be overwhelmed by storm water during heavy down pours, or in flood events, which can lead to backflow in the drainage system. A drain non-return valve has a single flap to prevent water backing up the drain pipe and into properties. This would help stop internal and [illegible] flooding
Attenuation	Temporarily stores storm water for a period of time, to then release back into sewer netwo[illegible]. The storm water is collected and routed into the sewer the normal way but with the use of flow controls, t[illegible]ed volume to flow through into the main system. Creates additional volume to reduce storm impact.

INTELLIGENT NETWORK OPERATION

1

- Sensible option of making the existing infrastructure work harder
- Feels dynamic, responsive and less disruptive
- However, some concerns over how effective and how resilient this option would be
- Short-term fix rather than a longer term solution

ATTENUATION

2

- Feels like a simple/lower cost solution
- Stored water could be reused where/when required
- Expected storage facilities linked to businesses, new developments, farms, spare land etc
- Minority concerns about potential long-term effectiveness: enough of them? Are they large enough?
- Does not address issue of taking surface water through the sewage treatment process

INCREASE CAPACITY OF EXISTING SEWERS

3

- Concept of 'doing more with the same' appeals
- However, prompts concerns around longevity
- Would be costly, unless could be part of maintenance process
- Does not address issue of taking surface water through the sewage treatment process

SEWER REHABILITIATION

4

- Selected as a 'no brainer' – aren't Wessex doing this anyway?
- For some could be false economy if existing sewers could not cope with future demand

Accent

COMBINED AND FOUL WATER SYSTEMS

Some less popular options felt too short-term or less scalable

PROPERTY LEVEL RESILIENCE 5

- Felt to be a sticking plaster fix whilst more robust solutions are implemented
- Protects the health of householders and damage to individual properties
- Minority unsure why they should pay for others who choose to live in high-risk areas
- Some concerns about where the water would go

REDUCE GROUNDWATER INFILTRATION 6

- Dismissed as a short-term option with assumed limited scope to address significant challenges
- Expected Wessex to be doing this anyway: especially if it potentially address the challenges

Option name	Detail
Intelligent network operation (smart network)	Controlling the flow movement in reaction to the current situation. Allows the system to be operated proactively, maximising the use of existing assets (sewer pipes, treatment works, etc). These options cover a range of different approaches e.g. modifying the start-stop levels at strategic pumping stations, creation of new network control points which allow for flow to be temporarily held back in the catchment. This would allow for flow of foul and surface water throughout the network to ease the amount of water in the system during heavy periods. Note: A pumping station is an intermediate storage/collecting chamber which transfers either the foul or surface water to a local drain, manhole, or sewer
Increase capacity of existing foul/combined networks	Replace existing sewer with a large diameter sewer to increase capacity
Wastewater transfers	The movement of sewer flow to another area within the Wessex area, or company
Sewer rehab	Sewer rehabilitation (updating) to improve the equipment and prevent collapses/blockages
Reduction of sewer groundwater infiltration	Infiltration is groundwater that enters sewer pipes through cracks, leaky pipe joints, connection failures and deteriorated manhole covers. Infiltration amounts vary by season and in response to groundwater levels. This would see these cracks, leaky pipe joints, etc repaired/sealed
Property Level Resilience	Protecting properties by use of non-return valves, pumps, flood gates etc. Drains can be overwhelmed by storm water during heavy down pours, or in flood events, which can lead to backflow in the drainage system. A drain non return valve has a single flap to prevent water backing up the drain pipe and into properties. This would help stop internal and external sewer flooding
Attenuation	Temporarily stores storm water for a period of time, to then release back into sewer network at another time. The storm water is collected and routed into the sewer the normal way but with the use of flow controls, this allows a controlled volume to flow through into the main system. Creates additional volume to reduce storm impact.

WASTEWATER TRANSFERS 7

- Rejected on the basis of moving the problem elsewhere rather than providing long-term solutions
- What would be the environmental impact
- Concerns about cost

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COMBINED AND FOUL WATER SYSTEMS

Attenuation may be a solution but I would need to see data that proves the temporary storage would also be able to comfortably hold the storm water and not cause further problems elsewhere

With an ever-growing population at some point the sewer capacity is going to be too small for the demand so its better to get ahead and do it now then when the problem actually occurs.

Increase capacity of foul and combined networks In my opinion this is the best way forward for the future, especially post covid more people working from home and will be living in our area.

I like the Intelligent Network Operation' option, using the existing assets eradicates some other options' as repairing existing assets should be happening anyway and would continue to happen

Property Level Resilience - Good idea, but the water is flowing back up pipes for a reason, preventing this flow must mean the water must go elsewhere.

I've seen attenuation systems in new developments. Sometimes they make a feature of them like a pond with reeds. There should be more of those around and it would be good for Wessex Water for people to see them

WASTEWATER TREATMENT

Potential environmental impact has a strong bearing on selections here:

TREATMENT AT OVERFLOWS

1

- A popular option in principle
  - Some reference to Somerset levels
- Working with the environment - an organic process
- Assumed to involve minimal disruption
- However, some questioned how much coverage would be possible and how scalable across the area
- Some concerns about the impact on the local eco system
- Some water retailers suggest partnering with businesses with land to develop in partnership

INCREASE TREATMENT CAPACITY

2

- Makes sense to do more with the same and assumed not too much disruption
- However, customers wanted more information as to how much the capacity could be increased and whether a long-term solution

TREAT/PRE-TREAT IN NETWORK

3

- Makes sense to reduce the time/pressure on WRCs
- Concerns, however, about introducing chemicals into the process: health and environmental
- Assumed high cost to monitor water quality throughout the network
  - and potential for errors/spills

Option name	Detail
Treat/pre-treat in network	Chemical dosing prior to flow reaching the treatment works to relieve the load transferred to the sewage treatment works or to remove contaminants. This means that water would be treated before it reaches the waste water treatment works
Treatment at overflows	Use of reedbeds/wetlands to provide treatment. Note: Reed beds are an aquatic plant-based system which allows bacteria in the root to feed on the organic matter contained in the sewage. Wetlands - As wastewaters flow through the system, suspended solids and trace metals settle and are filtered. Plants and organic material also absorb trace metals.
Increase treatment capacity	Increase the efficient use of the existing waste water treatment works Or Invest in new treatment works to provide additional capacity within existing site footprint.
Rationalisation/centralisation	Close smaller treatment works and transfer flows to a larger one.
Decentralisation	Remove flows from a treatment works and create localised treatment works.

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WASTEWATER TREATMENT

Addressing local requirements more efficiently is often prioritised

DECENTRALISATION

4

- More popular than rationalisation due to lower reliance on a small number of large WRCs
- Considered to be a way of effectively addressing local issues
- Could create more local jobs
- Some concerns about more WRCs to go wrong and higher costs
- Rejected by some due to potential local environmental impact

RATIONALISATION

5

- For some this was about reducing resources needed to maintain numerous WRCs
- Others were concerned about all 'eggs in one basket' – if there is an issue the impact will be widely felt
- Could result in loss of jobs – already an issue post Covid

Option name	Detail
Treat/pre-treat in network	Chemical dosing prior to flow reaching the treatment works to relieve the load transferred to the sewage treatment works or to remove contaminants. This means that water would be treated before it reaches the waste water treatment works
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Decentralisation would create more local jobs and make Wessex Water more noticeable in the local community

What's the point of taking all the water to a great big facility in Bristol or somewhere?

Treat / pre-treat in Network is a Lazy option. Why would you treat with a chemical which you are then going to have to remove before the water can be piped back to homes etc.

My second option would be to increase treatment capacity within the existing footprint by investing in superior equipment.

Treatment at overflows is a good idea as it uses the environment to help the sewage system with it not placing further chemicals into the water and using Reed beds instead.

WASTEWATER TREATMENT

It doesn't make sense to introduce chemicals in the process and then have to monitor the water more

my least favorite would be the Decentralisation as i can't imagine many homeowners relishing having a 'localised' treatment works near to their property.

CUSTOMER SIDE MANAGEMENT

Treatment and reuse feels innovative and future focussed

Option name	Detail
Greywater treatment and re-use	Install systems to treat and re-use household water (excluding toilets) for flushing toilets and gardening use. Either at property level or larger scale to reduces both flow and load to the system. The treatment levels considered vary from treatment for potable use to pre-treatment for discharge into the combined or foul sewer network.
Blackwater (from toilets) treatment and re-use	Install systems to re-use household water for flushing toilets and gardening use. Either at property level or larger scale. Options vary from pre-treatment before the wastewater is conveyed through to a sewage treatment works, to complete treatment of blackwater.
Water efficient measures (property/ community/industrial)	Water efficiency measures can be installed within buildings with the purpose of reducing water consumption. Reduced consumption can also benefit the wastewater system by reducing the flow of water being carried in dry weather through the sewer network and through the sewer treatment works.
Customer incentive	Financially rewarding customers who sign up to a range of programs which are designed to help customers make smart choices in managing and/or utilising water and wastewater services.
Domestic and business customer education	Roll out of an education programme to improve understanding of the importance of reduced flows and misuse of the system, and the impact this has on the environment and sewerage system.
Water efficient appliances	Supplying customers with household appliances which are designed to reduce water consumption. Reduced consumption can also benefit the wastewater system by reducing the dry weather flow to be conveyed through the sewer network and through the sewage treatment works.

GREYWATER TREATMENT AND REUSE

1

- A popular option
- Makes complete sense to reuse for non-drinking purposes
- Reduces guilt in sending 'clean' water to sewage
- Some knowledge of existing toilets with integrated basins, so doesn't feel too far a stretch
- For consumers it is ideal if the system is contained within their own household
- Could be integrated into new developments
- Potential costs/accessibility would be a barrier
- Some interested among NHH if help provided
- Water retailers feel there is an opportunity for Wessex to have effective dialogue with practical solutions for businesses

BLACKWATER TREATMENT AND REUSE

3

- For some, reactions are as above
- Others are concerned about cost and health risks
- Some strong concerns around the idea of 'larger scale' – not just my household's waste

WATER EFFICIENT APPLIANCES

2

- More popular with younger customers and some families
- Some are unsure about overall impact on challenges
- Some consumers and NHH in hospitality are cynical as to effectiveness and some bad experiences
  - shower heads not working with combi boilers
  - Dual flushes are confusing or not enough water, so false economy

WATER EFFICIENCY MEASURES

4

- Some interest here, but limited information as to potential cost and impact
- Assume more suitable for new developments and larger businesses
- Again Water retailers feel Wessex could work more effectively with larger businesses here

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CUSTOMER SIDE MANAGEMENT

Education is expected to have a longer-term impact on influencing social norms- if unlikely to change behaviour in the short term

Option name	Detail
Greywater treatment and re-use	Install systems to treat and re-use household water (excluding toilets) for flushing toilets and gardening use. Either at property level or larger scale to reduces both flow and load to the system. The treatment levels considered vary from treatment for potable use to pre-treatment for discharge into the combined or foul sewer network.
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EDUCATION

5

- While all agree this is necessary there are mixed views on effectiveness and therefore prioritisation
- Wessex could (and already do) spend money educating users without changes in behaviour
- Some older customers are more optimistic
- Longer term opportunity to educate children and develop ‘new normal’
- Those affected by incidents feel more money should be spent on education and better investigation of causes
- Complete spread of attitudes towards saving water and relevant behaviour within our sample
- NHH claim unlikely to change unless there is real financial gain
- Water retailers feel there is an opportunity for Wessex to have effective dialogue with practical solutions for businesses

CUSTOMER INCENTIVES

5

- Future and some existing customers are interested in reducing bills and ‘win win’ opportunity
  - Also appeals to those on low incomes
- Expected to work alongside and enhance education initiatives
- Those in favour assumed reduction in bills or help towards installing systems
  - Some parallels drawn with grants to install solar panels etc: mixed views of success
- Some (esp NHH) rejected as unlikely to shift behaviour if saving money on metered account is not enough motivation
  - Water retailers feel there is an opportunity for three-way discussion with Wessex and some larger business customers

my least favorite option would be customer education as i feel the biggest abusers of water are the corporate businesses. I hink the average person already re-cycles water to a certain degree anyway & probably wouldn't appreciate someone lecturing them

I feel that supplying water efficient appliances will benefit the customer greatly because it will encourage them to reduce water usage whilst being supplied with the resources needed to help achieve this

CUSTOMER SIDE MANAGEMENT

we all waste so much water so reusing grey water would be a good idea. I think greywater reuse is better than blackwater reuse because you automatically shudder at the idea of blackwater reuse.

Customer incentive - That money could be spent on other things, seems to be a little bit of a waste. Would be better to just educate them and hope they do it by themselves

I think we have all been far too complacent with regards to our water and. Have left it to the water companies to manage it all

My least favourite would be Black water treatment as to me it doesn't sound plausible

Impact of additional information on reactions to GOs

How acceptable is each of these options (1-5)

0-3 Score (3= good)

		Sewer flooding incidents and storm overflows	Carbon emissions	Impact on rivers / environment	Construction impact	Cost	Certainty of solution
Water Recycling Centre options							
Wastewater Treatment Works	Increase treatment capacity	2	1	3	2	1	3
	Catchment initiatives and permitting	0	3	2	1	3	1
Flooding and Storm Overflows options							
Customer Side Management	Customer education (wetwipe blockages, misuse, lifting covers)	3	3	2	3	3	2
	Separation - Sustainably preventing rainfall entering sewers / SuDS	1	1	2	2	1	1
Surface Water Management	Separation - Traditional surface water sewers	2	0	2	0	0	3
	SuDS and Wetlands to treat excess combined flows	2	3	3	1	1	1
Combined and Foul Sewer Systems	Increase network capacity / build underground tanks	3	1	2	1	2	3
	Live with flooding, but Reduce impact of flooding (mitigation)	2	2	1	3	3	3
	Smart systems	1	3	2	3	2	1
Asset health							
Combined and Foul Sewer Systems	Making sewers watertight to prevent groundwater inundation	1	1	2	1	1	1
	Replace ageing sewers - intergeneration investment	1	2	2	1	1	3
Asset health							
Combined and Foul Sewer Systems	Sewer rehabilation using no-dig technology	1	1	2	2	2	2
	Sewer rehabilation using trenches in roads	1	1	2	0	2	3

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PRESENCE OF IMPACT INFORMATION OFTEN SHIFTED ORIGINAL PRIORITIES AND MADE SOME SOLUTIONS MORE/LESS ACCEPTABLE

Certainty of solution alongside cost and/or environmental impact are key considerations

How acceptable is each of these options (1-5)

0-3 Score (3= good)

		Sewer flooding incidents and storm overflows	Carbon emissions	Impact on rivers / environment	Construction impact	Cost	Certainty of solution
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	Sewer rehabilation using trenches in roads	1	1	2	0	2	3

Impacts reflect spontaneous requests for more information, BUT

- Some want to know how the calculations are made
- Some initial confusion around low vs high, good vs bad – must be clearly emphasised – eg 3 for cost is low not high: hence green
- Various requests for carbon emissions to be offset by WW – do they plant trees, use hydro power etc?
- Some (especially experiencers) still went with the ideas they initially preferred, regardless of weightings

Some terminology needs reviewing/ explaining:

- Catchment initiatives and permitting
- SuDS
- 'Live with flooding' but…
- 'no-dig' technology

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OPTIONS THAT OFTEN BECAME OR REMAINED HIGH PRIORITY

Certainty of solution alongside cost and/or environmental impact are key considerations

How acceptable is each of these options (1-5)

0-3 Score (3= good)

		Sewer flooding incidents and storm overflows	Carbon emissions	Impact on rivers / environment	Construction impact	Cost	Certainty of solution
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	Sewer rehabilation using trenches in roads	1	1	2	0	2	3

INCREASE TREATMENT CAPACITY

- High certainly of some reduction in incidents
- Low impact on rivers
- Cost and disruption acceptable for longer term gain

BUT

- Requests for carbon offset (esp. younger)

CUSTOMER EDUCATION

- Fairly certain of reduction in incidents at low 'cost'
- Examples of wet-wipes etc helps to ground in reality

INCREASE NETWORK CAPACITY/UNDERGROUND TANKS

- Confirmation of effectiveness appeals to those unsure of impact

TRADITIONAL SURFACE WATER SEWERS (SOME)

- Certainty of effectiveness long-term is enough to make up for short-term disruption for some
- BUT too costly in price and carbon for others

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OPTIONS THAT OFTEN BECAME OR REMAINED LOWER PRIORITY

Certainty of solution alongside cost and/or environmental impact are key considerations

0-3 Score (3= good)

How acceptable is each of these options (1-5)

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Water Recycling Centre options							
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SMART SYSTEMS

- Despite not too high cost and impact, uncertain and potentially limited reduction in incidences feels lower priority

SuDS and WETLANDS

- Uncertainty of reduced incidents and potential cost render this lower priority for those to whom scalability was already in question

SUSTAINABLY PREVENTING RAINFALL ENTERING SEWERS

- Much uncertainty with potential monetary and carbon cost reduces appeal here for those initially interested
- NOTE: ‘sustainable’ but with high carbon impact confuses

ASSET HEALTH OPTIONS

- Confirmed as potentially limited for a long-term solution, though still assumed as necessary ongoing expenditure

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WIILINGNESS TO PAY

Some differences in attitudes across the board

Which option would you prefer for your wastewater service?

	Option A (Same as now)	Option B (Reduced flooding)
Foul/combined sewer flooding incidents per year in Wessex Water region (1.2 million properties served in total)		
- Inside customers' properties	170	0
- Outside homes within property boundaries	2,000	1,500
- In roads, fields and parks	1,200	900
Your annual bill from Wessex Water	**£233 per year (Same as now)**	**£250.5 per year (£17.5 more than now)**
	☐	☐

> ***People are losing jobs and all bills will go up, so I'm not choosing to willingly pay more for not much of an impact***
>
> ***NHH***

UNWILLING TO PAY

- General economic uncertainty/pessimism
- Number of current incidents feels low compared to no. of households
- Some asked for clearer definition of incident
- People are responsible for their own properties
- Unlikely to happen to me
- How can Wessex ensure no household incidents?
- Sceptical about £17.50 – what about inflation and rest of bill(s)

WILLING TO PAY

- Amount of increase doesn't feel too high
- Nobody should experience sewer flooding
- Need to make improvements for the future
- **"The greater good" – I can afford to, others can't**

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TIMING OF INVESTMENT

Midway option is often selected as a fair timescale/payment plan

Which option would you prefer for your wastewater service?

	Option A (Same as now)	Option B (Invest by 2030)	Option C (Invest by 2035)	Option D (Invest by 2050)
Wastewater service levels (2025 to 2050)	Same as now out to 2050	Improve steadily from 2025 to 2030, then stay at new level from 2030 to 2050	Improve steadily from 2025 to 2035, then stay at new level from 2035 to 2050	Improve steadily from 2025 to 2050
Annual wastewater bill (2025 to 2050)	**Same as now (£233) out to 2050**	**Increase by £3.5 each year from £233 in 2025 to £250.5 in 2030, then stay at £250.5 from 2030 to 2050**	**Increase by £1.75 each year from £233 in 2025 to £250.5 in 2035, then stay at £250.5 from 2035 to 2050**	**Increase by £0.7 each year from £233 in 2025 to £250.5 in 2050**
	☐	☐	☐	☐

- Some discussion around bill levels and potential additional inflation-related increases
- Cynicism regarding improvements being achieved within five years
- Option B involving higher price rises followed by high bills for longer feels unacceptable to some
- Option C often chosen as 'middle ground' on the basis that 25 years feels too long for improvements
- Some older selected Option D on the basis that they may not personally benefit from improvements anyway
- **Some feel the planned improvements might change over the 25 years in response to evolving challenges**

> *I think it's better to get them down quickly, as the challenges are going to change again in a few years*
>
> *Incident experiencer*

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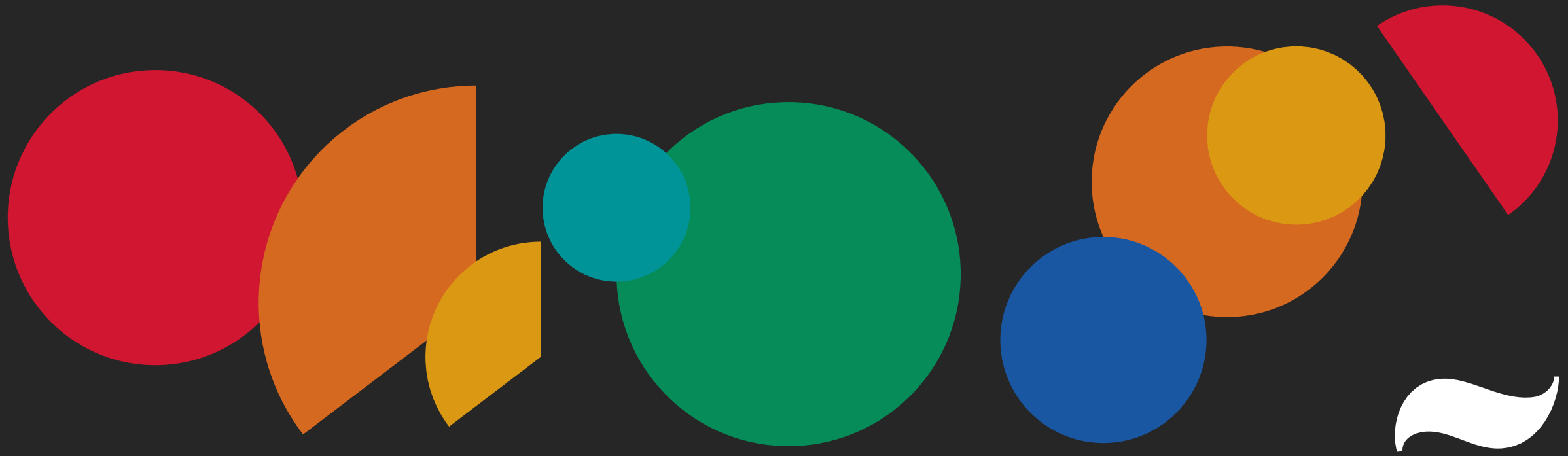
Thank you



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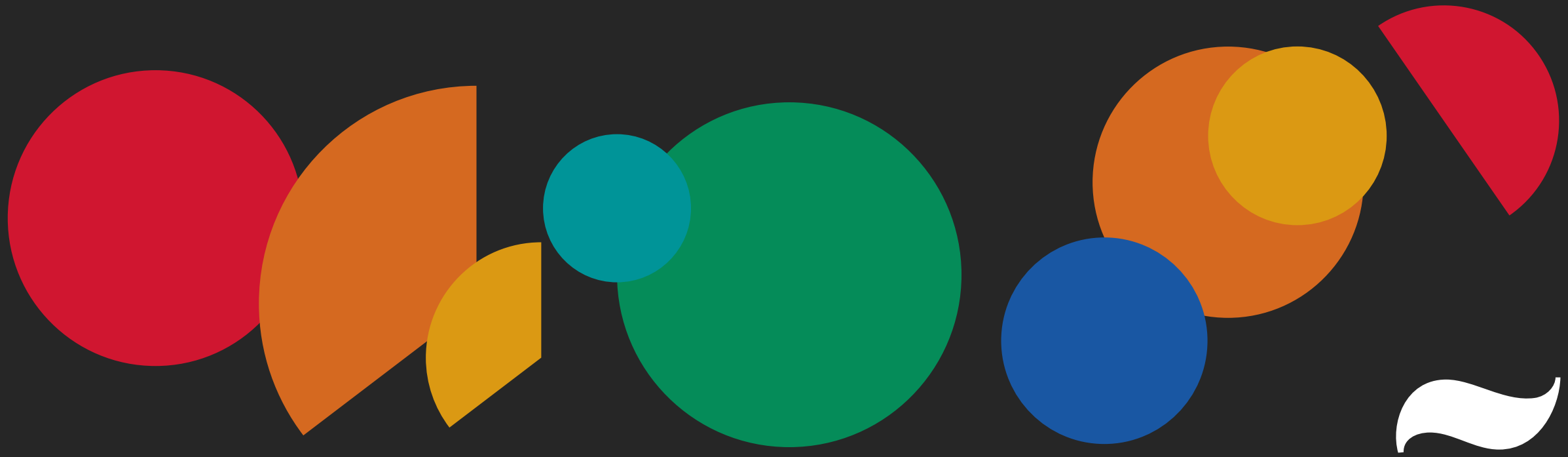

Drainage and Wastewater Management Plan Research: Quantitative Findings

Wessex Water, 24 November 2021

Agenda

1. Objectives
2. Survey Administration and Design
3. Measuring relative impacts of flooding & WTP for reduced flooding
4. When Wessex Water should invest
5. Preferences and WTP for DWMP outcomes
6. Support for alternative GOs
7. Conclusions

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1. Objectives

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Core objectives of research:

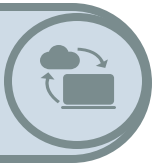
To understand customer views on…

01 Issues relating to wastewater drainage

02 The acceptability of impact and frequency of sewer flooding

03 The acceptability of and willingness to support a range of potential generic options

04 Willingness to pay for alternative generic options (GOs)



05 The impact on bills of alternative options and levels of service

06 When WW should invest in systems to make them resilient to potential future challenges such as climate change.

2. Survey Administration and Design

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Methodology overview

ENSURE ACCURACY

Survey had good coverage of all four drainage regions. The data was weighted to ensure robustness and reliability

FACE TO FACE

These were supplemented with **face to face interviews** to ensure coverage amongst hard to reach, vulnerable and digitally disengaged customers.

METHODOLOGY

Majority of interviews were conducted online among Wessex Water domestic customers' from our panel partners and from sample provided by Wessex Water. Business and vulnerable customer were also included.

SURVEY DESIGN

Two versions of the questionnaire, each containing different exercises, to avoid respondent fatigue

CHOICE EXCERCISE

To address the key objectives, we conducted a number of **choice experiments, ranking exercises and a contingent valuation exercise**

Methodology & survey administration

SURVEY A
CHOICE EXERCISES

1 Measuring relative impacts of flooding

5 WTP for reduced flooding

6 When Wessex Water should invest

Focus is on flooding and bills

SURVEY B
CHOICE EXERCISES

2 Preferences and WTP for DWMP outcomes

3 Support for alternative GOs

Focus is on broader DWMP outcomes and generic options

Total Sample size	2,181 interviews
Weighted subgroups	Domestic: 1,854 (85%) Future customers: 47 (2%) NHH: 279 (13%)
Method	Online (panel, Wessex sample, Youthsite, Respondi) F2F
Supply area	Dual: 1,691 (78%) Bristol: 236 (11%) Bournemouth: 253 (12%)

Customer views elicited through a series of choice exercises, split across two surveys

Measures of validity

HIGH LEVEL OF VALIDITY

- Very few instances of non-trading behaviour i.e. where participants always choose the same alternative throughout the exercise.
- Positive participant feedback: choices were easy to understand, and people were able to make comparisons between the options presented to them.

Example: SP1 Non-traders

Measure	HH	NHH	Total
Number of participants	979	118	1097
%	**89%**	**11%**	**100%**
Always chose Option A	10	2	12
%	**1.02%**	**1.69%**	**1.09%**
Always chose Option B	6	0	6
%	**0.61%**		**0.55%**

Example: SP2 participant feedback

Measure	Yes	No	Total
Did you generally feel able to make comparisons between the options presented to you?	924	160	1084
%	**85%**	**15%**	**100%**
Were any of the options shown hard to understand?	192	892	1084
%	**18%**	**82%**	**100%**

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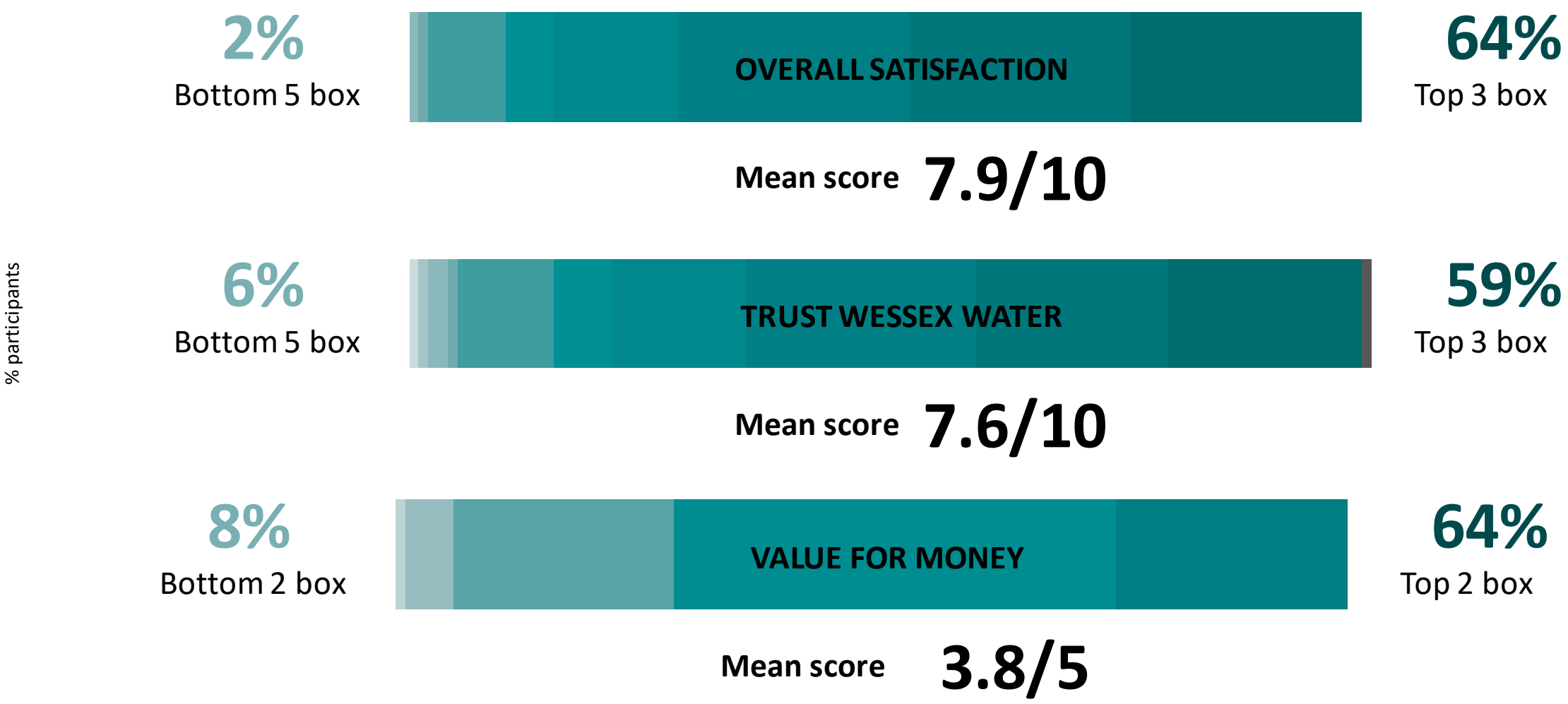
Key metrics - DWMP

Perceptions of Wessex Water

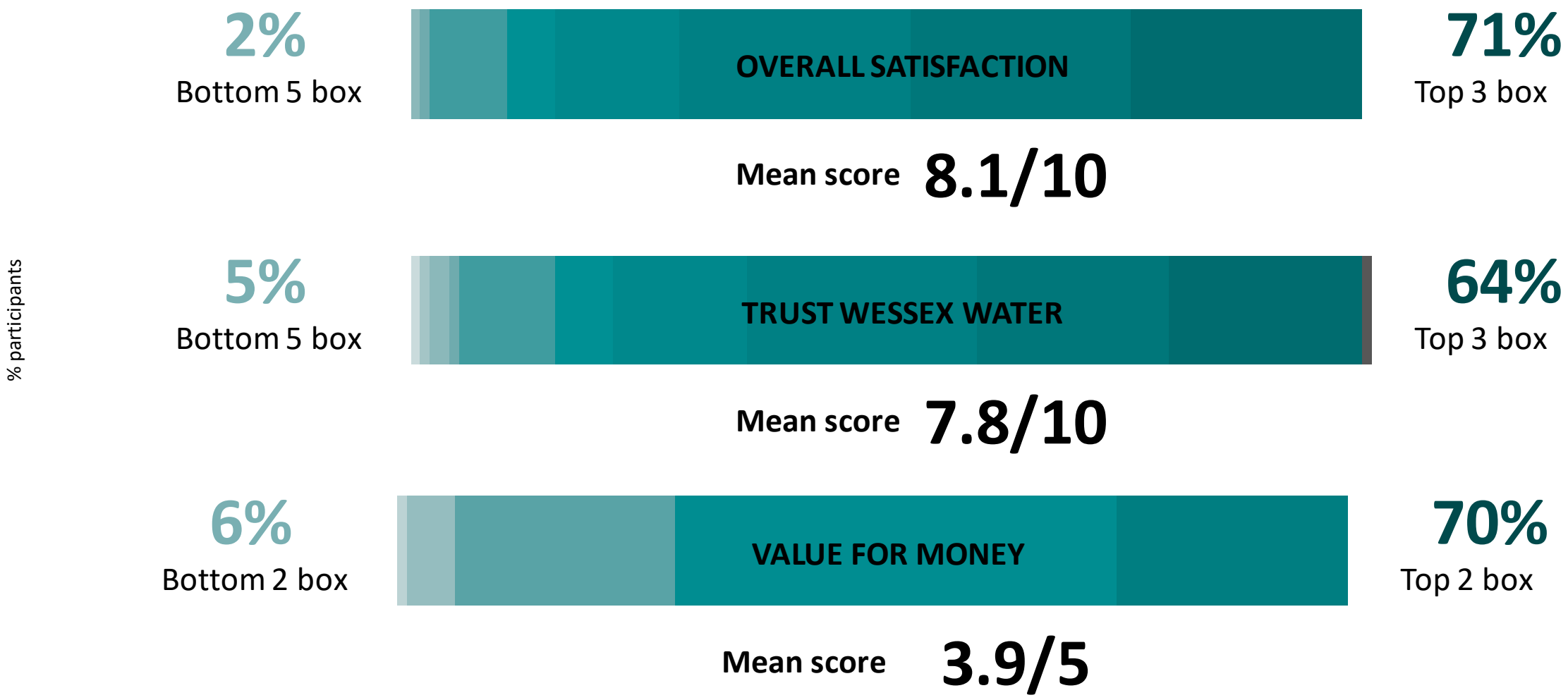


Q28. How satisfied would you say you are with the overall service provided by Wessex Water? (10 point scale) Weighted base size: n=2,181
Q29. How much do you trust Wessex Water? (10 point scale) Weighted base size: n=2,181
Q30. How satisfied are you with the value for money of the services you receive? (5 point scale) Weighted base size: n=2,181

Accent

Key metrics -SSD

Perceptions of Wessex Water



Q32. How satisfied would you say you are with the overall service provided by Wessex Water? (10 point scale) n=1,514
Q33. How much do you trust Wessex Water? (10 point scale) n=1,514
Q34. How satisfied are you with the value for money of the services you receive? (5 point scale) n=1,514

Accent

Measuring relative impacts of flooding & WTP for reduced flooding

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SP1: **Measuring relative impacts of flooding**

Example choice question

Which type of flooding would you consider the **worst** for you from the options shown below?

	Option A	Option B
Location	Outside your home but within the property boundary: **More than** 10 square metres affected	In your road
Type of water	Rainwater only	Foul/Combined
Frequency	Twice in 1 year	Once in 1 year
	✓	○

- Survey participants saw eight questions each
- Location, Type of water and Frequency levels varied according to an experimental design

➢ Outcome from exercise is an index of relative impact across all the location, type and frequency levels shown.

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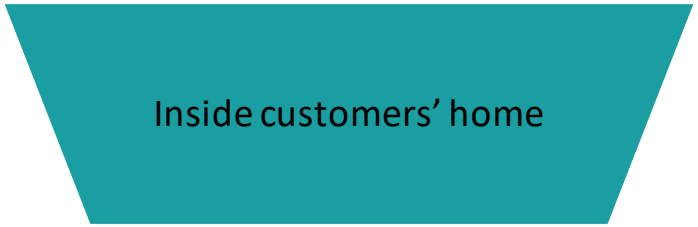
Measuring relative impacts of flooding

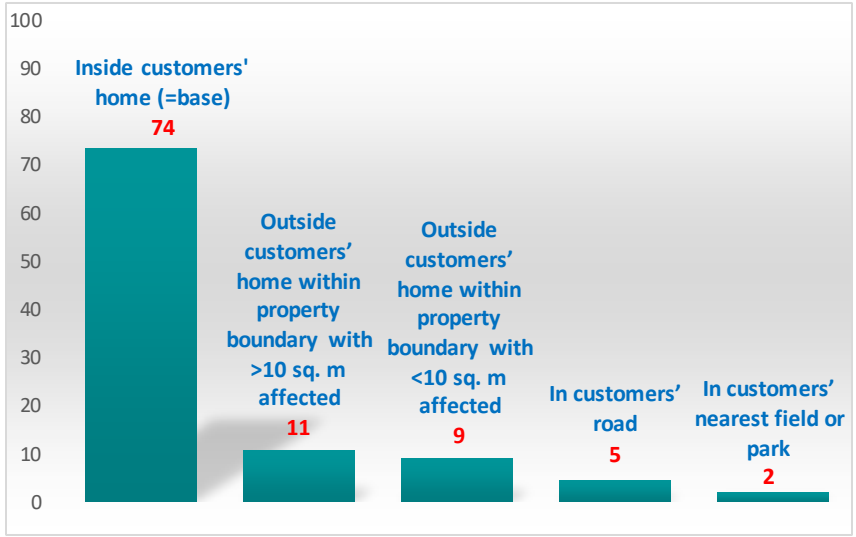
SP1 choice exercise results



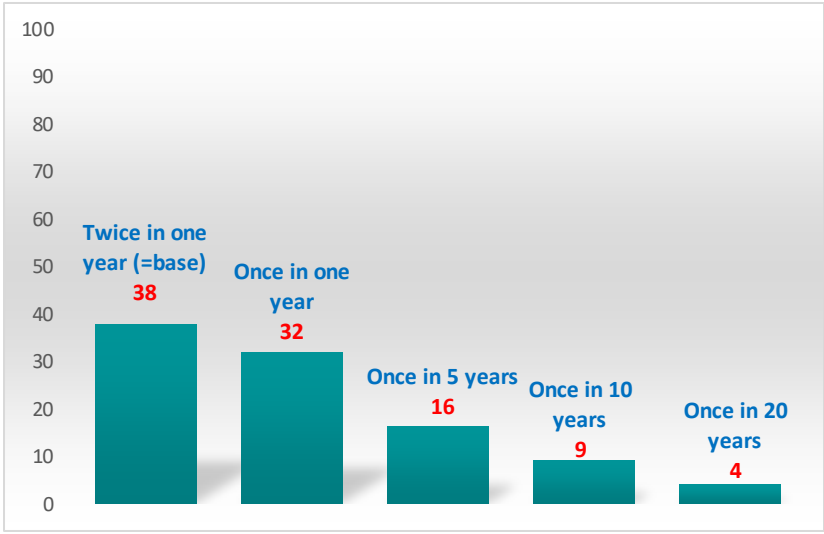
Measuring relative impacts of flooding

SP1 results: Customers' Flooding Priorities

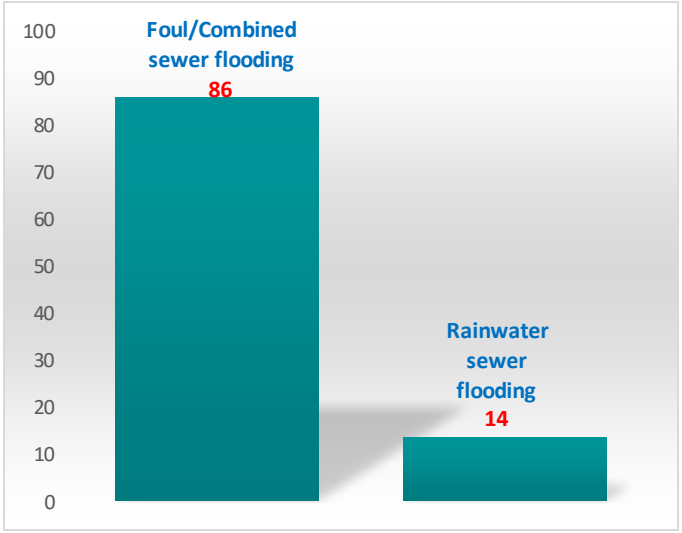
Location of Flooding



Frequency of Flooding



Types of Flooding



- The above figures indicate relative importance of the levels of location, type and frequency of flooding.
- SP1 model coefficients used to derive importance scores for the levels of location, type and frequency of flooding.
- Importance scores are scaled to sum to 100 to indicate the relative magnitude of the differences across flooding levels.

PJM economics Accent

SP5: **Willingness to Pay for reduced flooding**

Example choice question

If these were the only two options, which option would you **prefer** for your wastewater service?

	Option A (Same as now)	Option B (Reduced flooding)
Foul/combined sewer flooding incidents per year in Wessex Water region (1.2 million properties served in total) - Inside customers' properties - Outside homes within property boundaries - In roads, fields and parks	 170 2,000 1,200	 0 1,500 900
Your annual bill from Wessex Water	£294.00 per year (Same as now)	£299.00 per year (£5.00 more than now)
	✔	○

- Attribute levels fixed except for bill impact for Option B which varied across participants.
- Q1 cost levels: {2%; 4%; 8%; 16%; 32%}
- Q2 cost levels doubled or halved depending on Q1 answer

- Outcome from exercise is a measure of customer WTP for reduced flooding
- This can be combined with SP1 to obtain WTP estimates for avoiding each type of flooding

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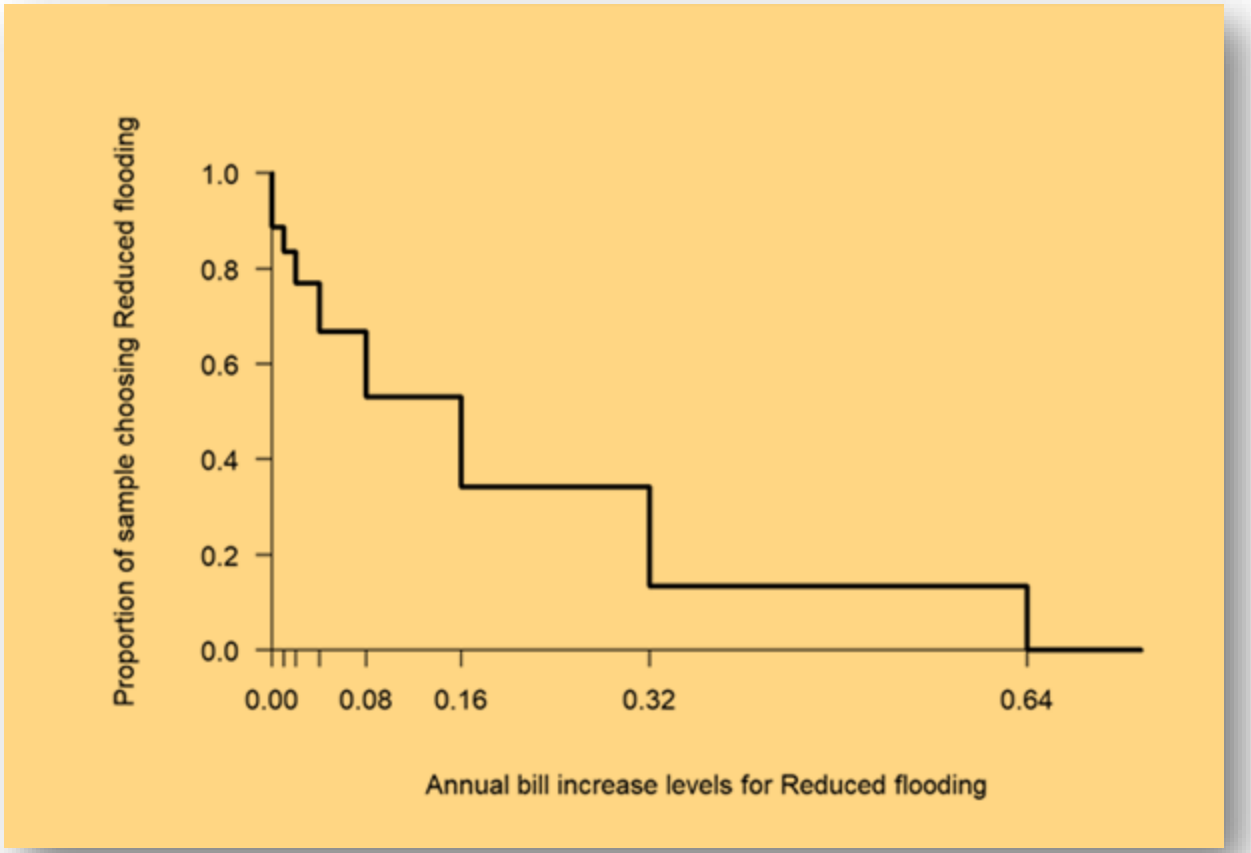
WTP for reduced flooding

SP5 choice exercise results

Nonparametric Turnbull estimator



Downward sloping curve > **participants more likely to choose Reduced flooding when cheaper than when more expensive.**

Model results show:

£ Mean willingness to pay for reduced flooding is **19% of the annual wastewater bill per year.**

£ **95% confidence intervals** around the mean is [17.9%, 21.7%].

£ For an **average household** paying an **annual wastewater bill of £223**, this implies:

- Mean **WTP for Reduced flooding of £44 per year**
- 95% of samples of the same kind from the same population would be expected to result in a mean WTP for Reduced flooding **between £40 and £48.**

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Measuring relative impacts of flooding & WTP for reduced flooding

SP1+SP5: Overall WTP estimates

Scaled WTP values per avoided sewer flooding incident, per property affected

Options	WTP (£/year/avoided foul/combined sewer flooding incident)	WTP (£/year/avoided rainwater only sewer flooding incident)
Inside customers' home	£227,377.9	£36,607.84
Outside customers' home within property boundary with >10 sq. m affected	£32,662.7	£5,258.69
Outside customers' home within property boundary with <10 sq. m affected	£28,092.51	£4,522.89
In customers' road	£14,635.22	£2,356.27
In customers' nearest field or park	£7,971.04	£1,283.34

Results derived by combining:

- Relative impact of service failures (***SP1)***
- Mean value for the package of service improvements (***SP5) and***
- Wessex Water Total connected properties

- Results show total customer valuation for entire customer base for avoiding 1 unit of each type of service failure per property affected.
- NB: For flooding affecting roads and fields/parks, values shown must be multiplied by numbers of properties affected.

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Measuring relative impacts of flooding & WTP for reduced flooding

SP1+SP5: Segmented WTP

	Types of Flooding	WTP (£/year/avoided foul/combined sewer flooding incident)	
REGION	Outside customers' home within property boundary with <10 sq. m affected	Somerset: £28,436	Hampshire & Avon: £27,983
	In customers' nearest field or park	Somerset: £6,604	Hampshire & Avon: £8,361
AGE	In customers' road	Age 30-44 years: £14,334	Age 65 plus years: £14,907
		WTP (£/year/avoided rainwater only sewer flooding incident)	
REGION	Outside customers' home within property boundary with <10 sq. m affected	Somerset: £4,578	Hampshire & Avon: £4,505
	In customers' nearest field or park	Somerset: £1,063	Hampshire & Avon £1,346
AGE	In customers' road	Age 30-44 years: £2,307	Age 65 plus years: £2,400

- SP1 model results used to obtain individual-level coefficients for the different levels of location, type and frequency of flooding.
- Individual-level coefficients then combined with the mean value for the package of service improvements (SP5) to derive individual-level WTP values for the different levels of location, type and frequency of flooding .
- Individual-level WTP values combined with WW total connected properties to derive total scaled WTP values for avoided sewer flooding incidents.
- Statistical significance in differences of mean WTP values between different segments assessed via multiple t-tests.
- Segments considered: Region (Bristol, Somerset, Hampshire & Avon and Dorset), Age (18-29, 30-44, 45-64 and 65 plus years), Seg Code (AB, C1,C2 and DE) and Gender (Male/Female).
- **Differences in mean WTP values between most segments were not statistically significant (at 5%) with some exceptions shown here.**

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When Wessex Water should invest

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SP6: **When Wessex Water should invest**

Example choice question

Of these four options, which option would you prefer for your wastewater service?

	Option A (Same as now)	Option B1 (Invest by 2030)	Option B2 (Invest by 2035)	Option B3 (Invest by 2050)
Wastewater service levels (2025 to 2050)	Same as now out to 2050	Improve steadily from 2025 to 2030, then stay at new level from 2030 to 2050	Improve steadily from 2025 to 2035, then stay at new level from 2035 to 2050	Improve steadily from 2025 to 2050
Annual wastewater bill (2025 to 2050)	Same as now (£294.00) out to 2050	2025 to 2030: Increase by £1.00/year (from £294.00 to £299.00) 2030 to 2050: Stay at £299.00	2025 to 2035: Increase by £0.50/year (from £294.00 to £299.00) 2035 to 2050: Stay at £299.00	2025 to 2050: Increase by £0.20/year (from £294.00 to £299.00)
	○	○	○	○

➢ Outcome from exercise is a preference order over alternative investment timing options

- Only one question asked per participant
- The bill impact varied across the design in line with the initial cost level shown to them in the SP5 exercise.

PJM economics Accent

When Wessex Water should invest

SP6 choice exercise results

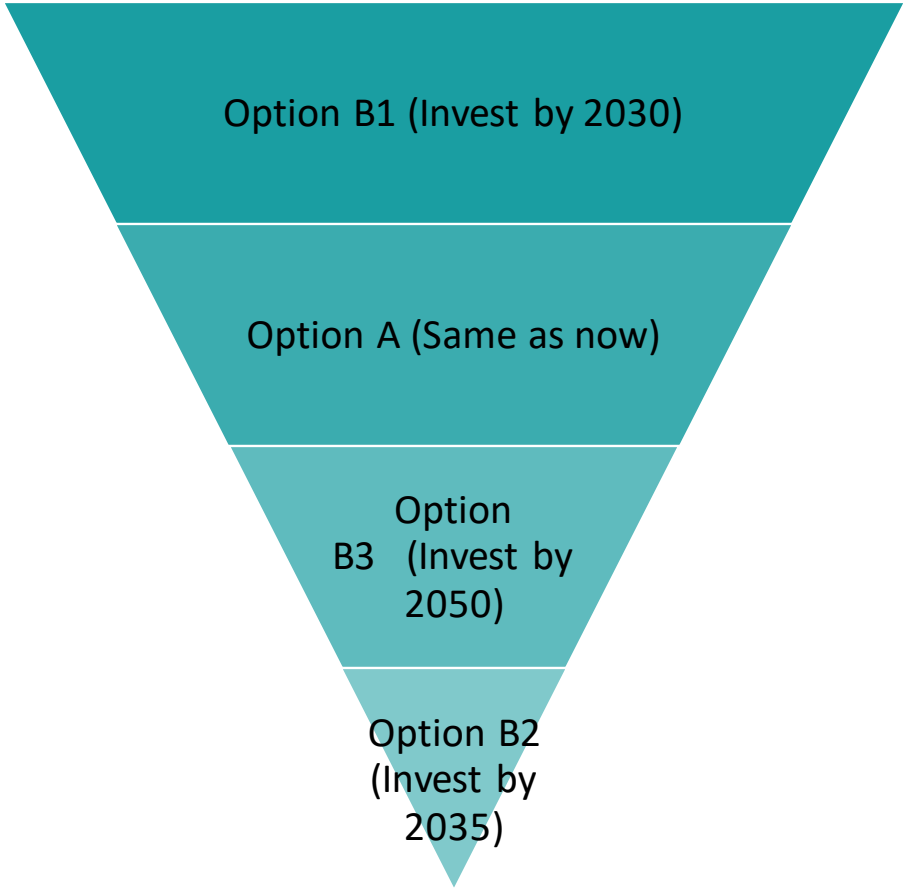
Tabulation of Options chosen

Options	Frequency	Percent
Option A: Same as now	232	21.1%
Option B1: Invest by 2030	478	43.6%
Option B2: Invest by 2035	167	15.2%
Option B3: Invest by 2050	220	20.1%

Results show participants' preferences.

- Option B1 is most preferred, followed by Option A, Option B3 and Option B2.
- **Bill increase does not seem to have a significant impact on choice.**

PARTICIPANTS' PREFERENCES



Click here to see the full data

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Preferences and WTP for DWMP outcomes

SP2: **Preferences and WTP for DWMP outcomes**

Which option would you prefer for your wastewater service?

	Option A	Option B
Sewer flooding incidents	-- 25% increase in flooding	+ 10% reduction in flooding
Carbon emissions	++ Reduce emissions by 1,000 tonnes/year (equivalent to 60 households)	+ Reduce emissions by 500 tonnes/year (equivalent to 30 households)
Impact on rivers	Same as now	++ 25km river improved (improved treatment and 20% reduction of storm overflows)
Local disruption	Same as now	-- Increased local traffic congestion for 12 months
Your annual bill from Wessex Water	£131.12 per year (£21.85 more than now)	£109.27 per year (Same as now)
	○	○

- Survey participants saw eight of these questions each
- Attribute levels all varied according to an experimental design

➢ Outcome from exercise is a set of WTP estimates for each attribute level change

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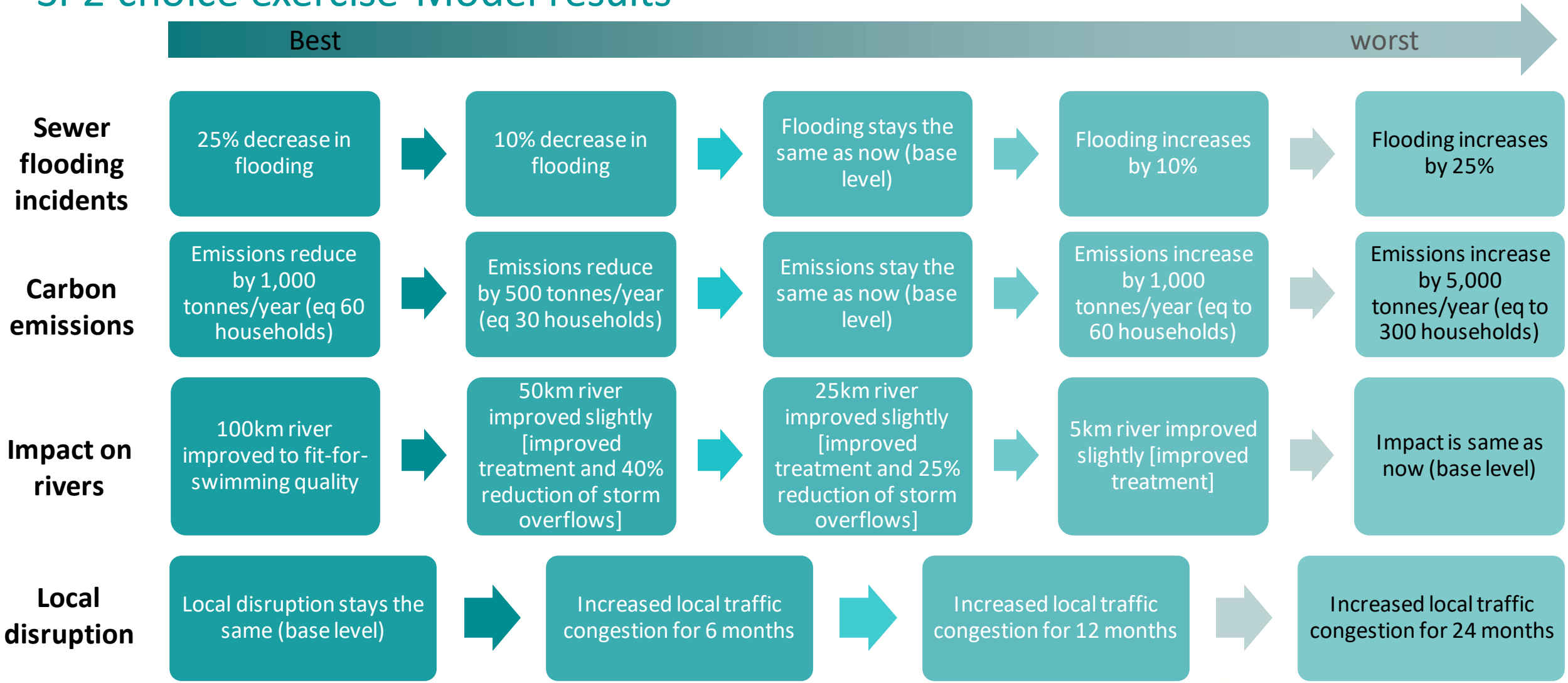
Preferences and WTP for outcomes

SP2 choice exercise Model results

Mixed Logit Model

Bill percentage changes : Participants prefer less costly options, all else equal.



Click here to see full data

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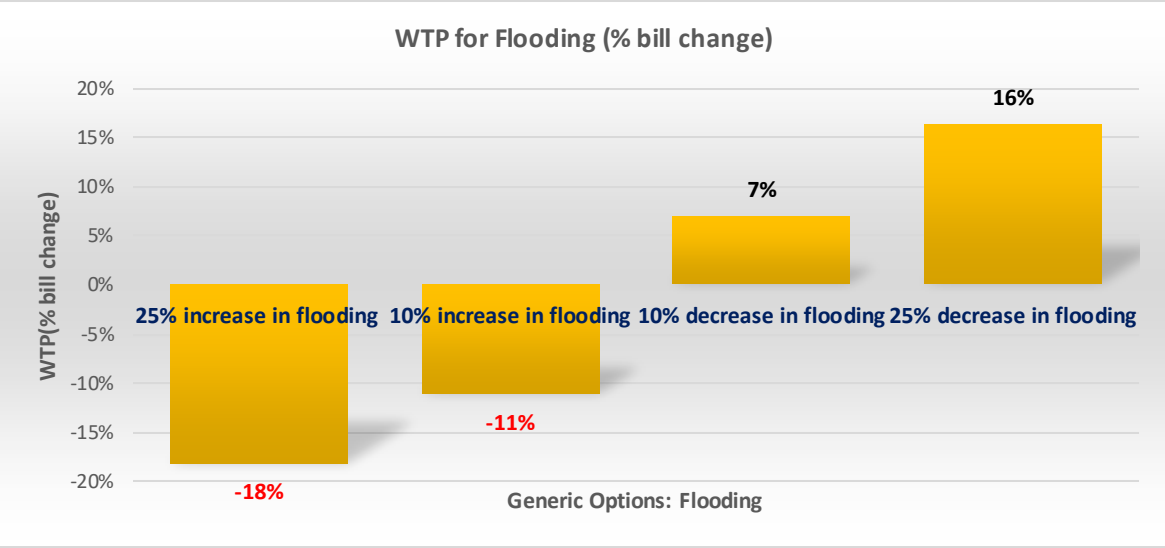
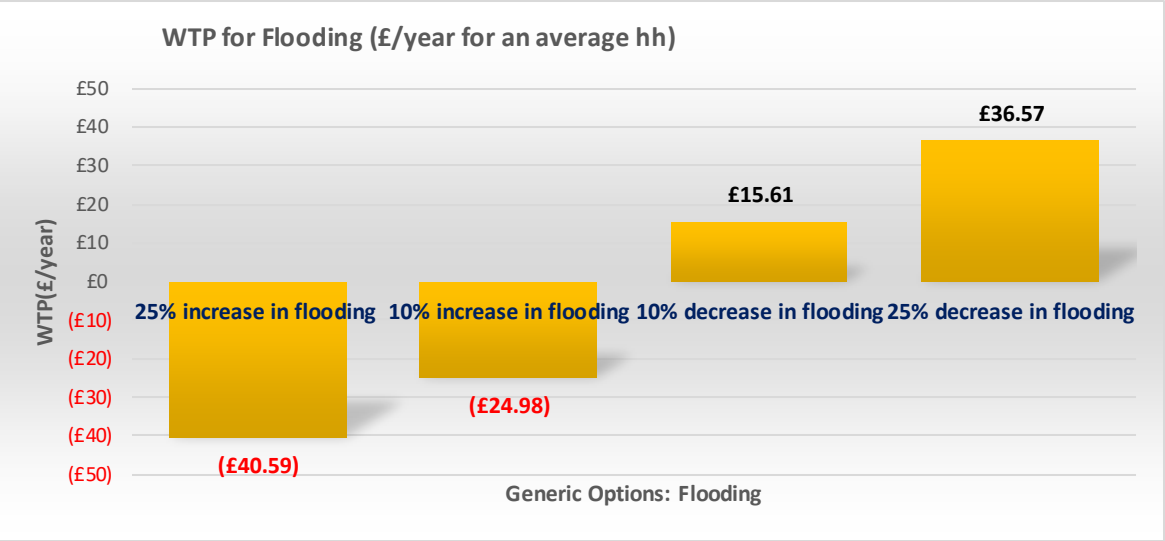
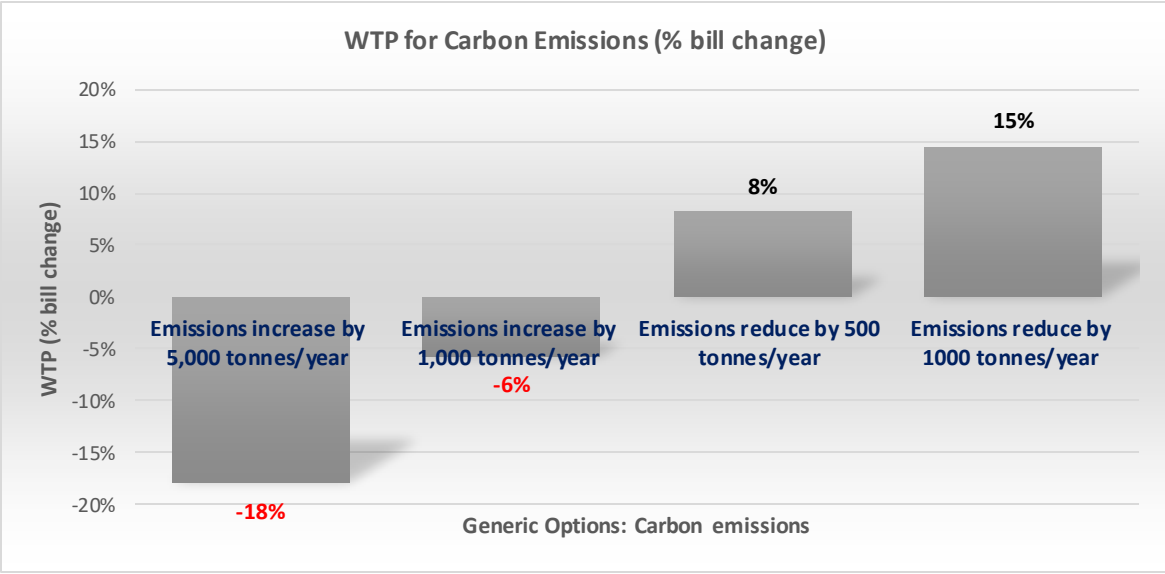
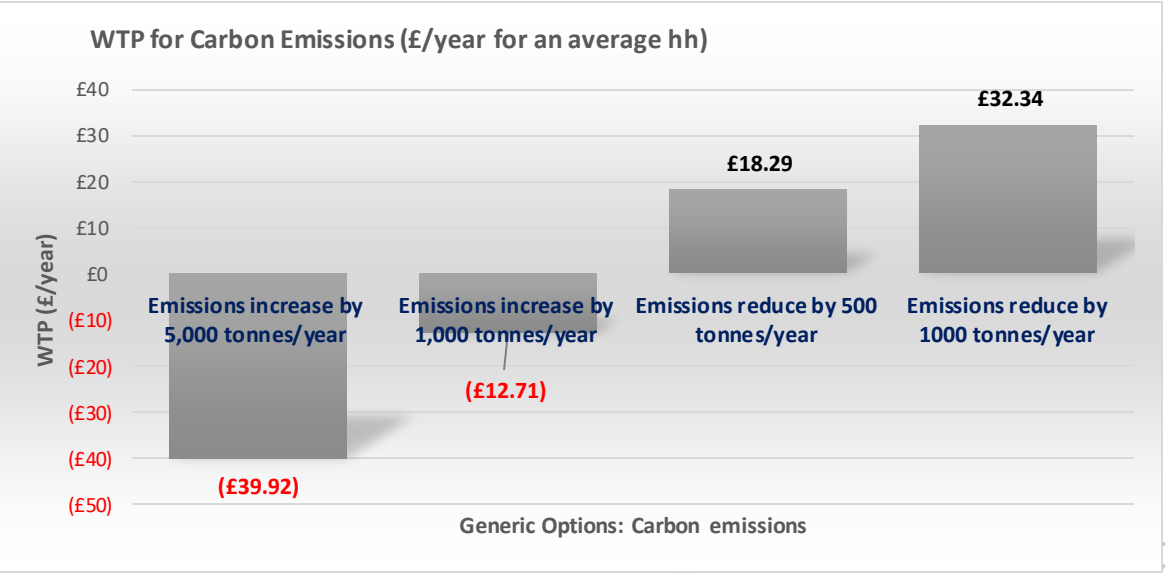
Preferences and WTP for outcomes

SP2 choice exercise results: Overall WTP (1)



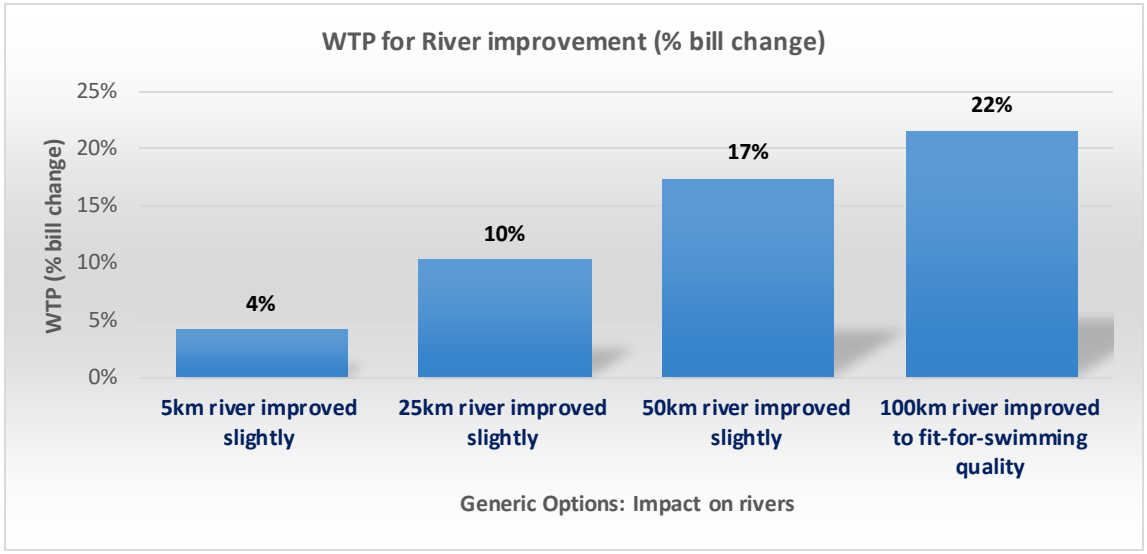


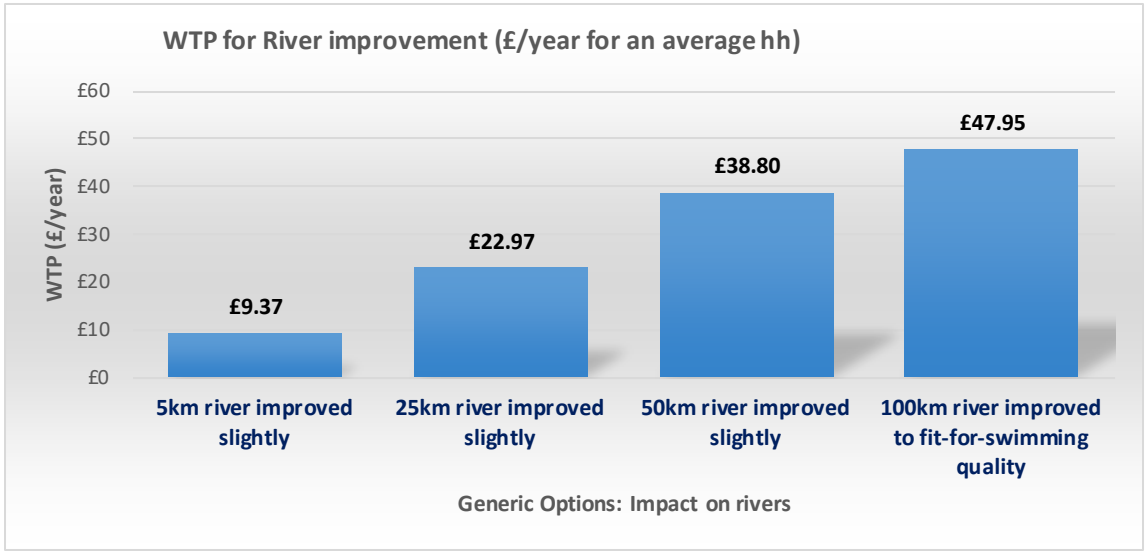


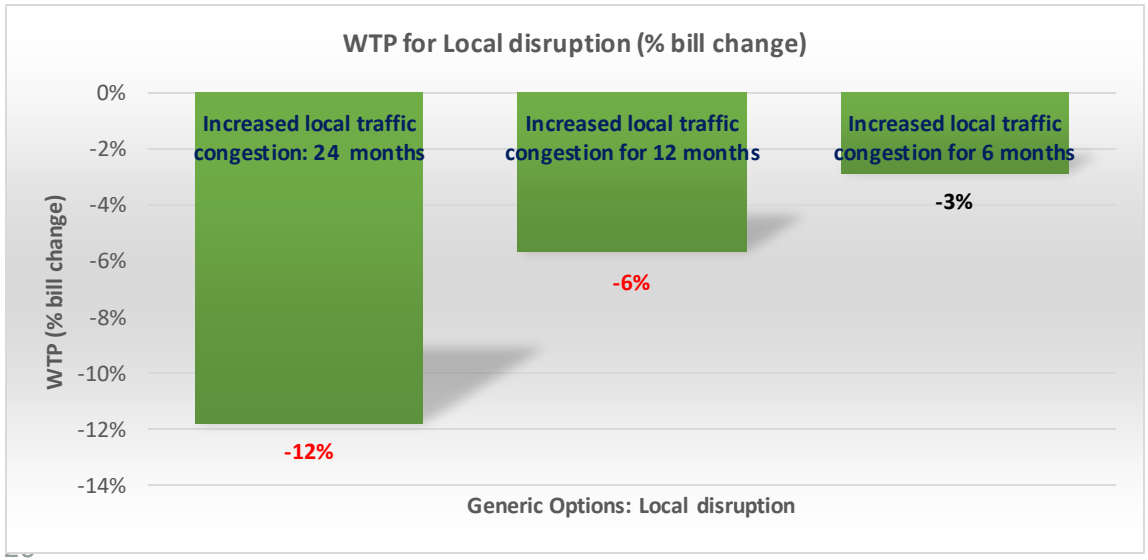


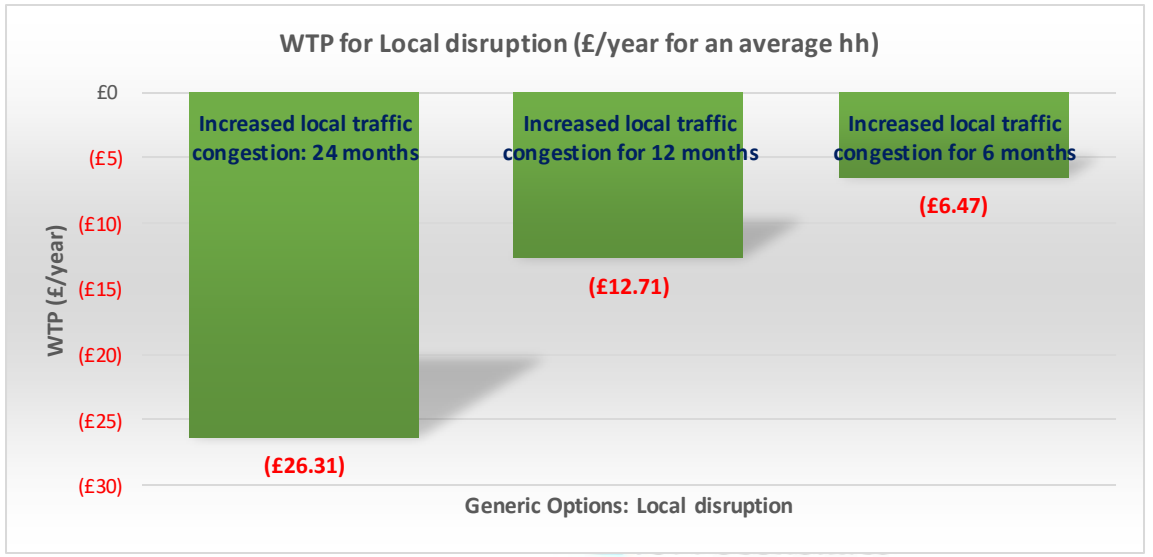
Preferences and WTP for outcomes

SP2 choice exercise results: Overall WTP (2)









Preferences and WTP for outcomes

SP2: Segmented WTP

	Generic Options	WTP (% bill change)	
AGE	25% increase in flooding	Age 18-29 years: -**15%**	Age 65 plus years: -**21%**
	25% increase in flooding	Age 45-64 years: -**16 %**	Age 65 plus years: -**21%**
	25% decrease in flooding	Age 18-29 years: **15%**	Age 65 plus years: **17%**
	25% decrease in flooding	Age 45-64 years: **16%**	Age 65 plus years: **17%**
SEG CODE	25% increase in flooding	Seg AB: **-22%**	Seg DE: **-14%**
	25% increase in flooding	Seg C1: **-19%**	Seg DE: **-14%**
	Emissions increase by 5,000 tonnes/year (eq to 300 households)	Seg AB: **-19%**	Seg DE: **-15%**
	Emissions increase by 5,000 tonnes/year (eq to 300 households)	Seg C2: **-21%**	Seg DE: **-15%**

- SP2 model results used to obtain individual-level coefficients for the various generic options.
- Individual-level coefficients then used to derive individual-level WTP values for the generic options.
- Statistical significance in differences of mean WTP values between different segments assessed via multiple t-tests.
- Segments considered: Region (Bristol, Somerset, Hampshire & Avon and Dorset), Age (18-29, 30-44, 45-64 and 65 plus years), Seg Code (AB, C1,C2 and DE) and Gender (Male/Female).
- **Differences in mean WTP values between most segments were not statistically significant (at 5%) with some exceptions shown here.**

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Support for alternative GOs

SP3: **Support for alternative GOs**

Generic options tested:

- **Wastewater Treatment Works:**
  - Increase treatment capacity
  - Catchment initiatives and permitting
- **Customer Side Management:**
  - Customer education (wet wipe blockages, misuse, lifting covers)
  - Separation - Sustainably preventing rainfall entering sewers / SuDS
- **Surface Water Management :**
  - Separation - Traditional surface water sewers
  - SuDS and Wetlands to treat excess combined flows
- **Combined and Foul Sewer Systems:**
  - Increase network capacity / build underground tanks
  - Live with flooding, but reduce impact of flooding (mitigation)
  - Making sewers watertight to prevent groundwater inundation
  - Smart systems

- Participants shown key information about each option as bullet points, a few options at a time
- Then, provided with a summary of the options with hover buttons to recover the more detailed information about each one if desired.

➢ **Key questions:**
- Are any of these options unacceptable to you?
- Are any of these options particularly appealing to you?

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Support for alternative GOs

SP3: Support for alternative GOs

Example choice question: Wastewater Treatment Works

Are either of these options **unacceptable** to you?

1-5 Score (5 = good)	Sewer flooding incidents	Carbon emissions	Impact on rivers	Local disruption	Cost
Increase treatment capacity	1	1	5	4	1
Pre-treatment initiatives and permitting	1	4	2	3	4

	Unacceptable	Neither	Acceptable
Increase treatment capacity	○	○	○
Pre-treatment initiatives and permitting	○	○	○

- The meaning of each of the scores (1-5) was shown in advance
- Hover buttons reveal the same info on what each of the scores means.

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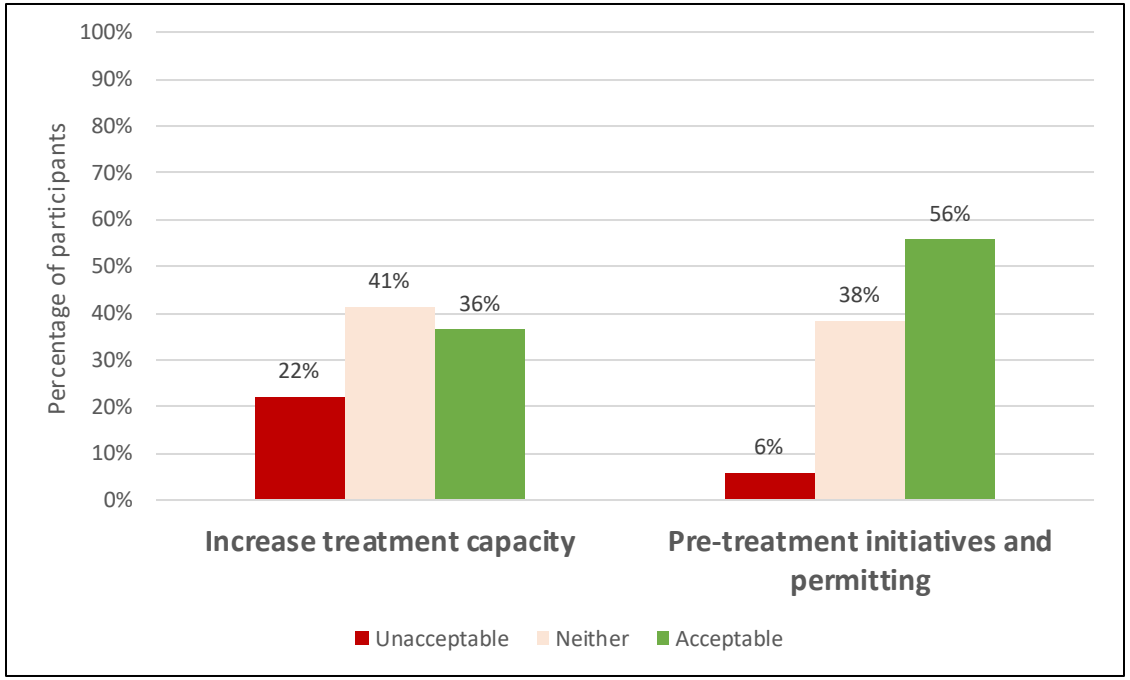
Scoring of Generic Options by Metric

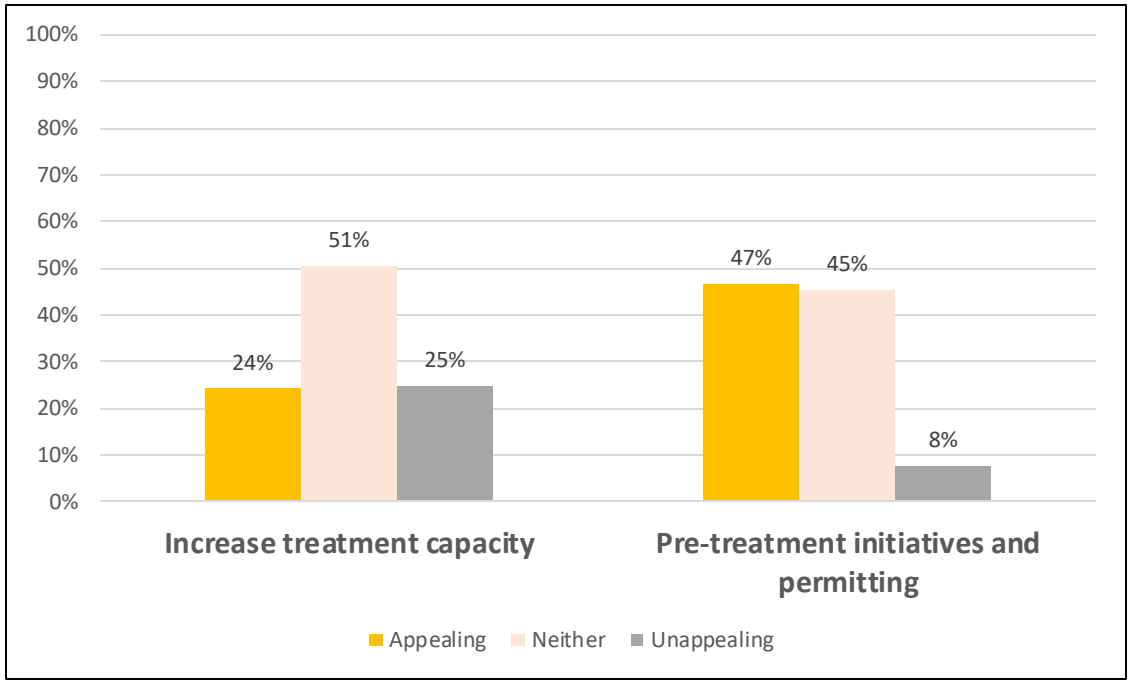
	Sewer flooding incidents	Carbon emissions	Impact on rivers	Local disruption	Cost
Score of 1	No change	High emissions	Little benefit	Significant disruption	Expensive
Score of 3	Reduction in flooding but not as much as other options	Medium emissions	Improvement but not as much as other options	Some local disruption	Affordable but may not be possible everywhere
Score of 5	Significant reduction in flooding incidents	Low emissions	Substantial improvement in water quality	No disruption	Cheap, but may not work

SP3 results: Wastewater Treatment

Acceptability of Wastewater Treatment options



Appeal of Wastewater Treatment options



ACCEPTABILITY: Much higher percentage found Pre-treatment initiatives and permitting acceptable compared to Increased treatment capacity
APPEAL: Much higher percentage found Pre-treatment initiatives and permitting appealing compared to Increased treatment capacity

Why unacceptable?

Increasing treatment capacity

COST	NEGATIVE ENVIRONMENTAL IMPACT
Because it's expensive	*no improvement to emissions or flooding*
More flooding and high costs	*Not tackling emissions and heightened flood risk.*
Mainly Carbon Emissions and Cost.	*high levels of sewage flooding, causes damage to rivers*
	Because of the negative impact on carbon emissions

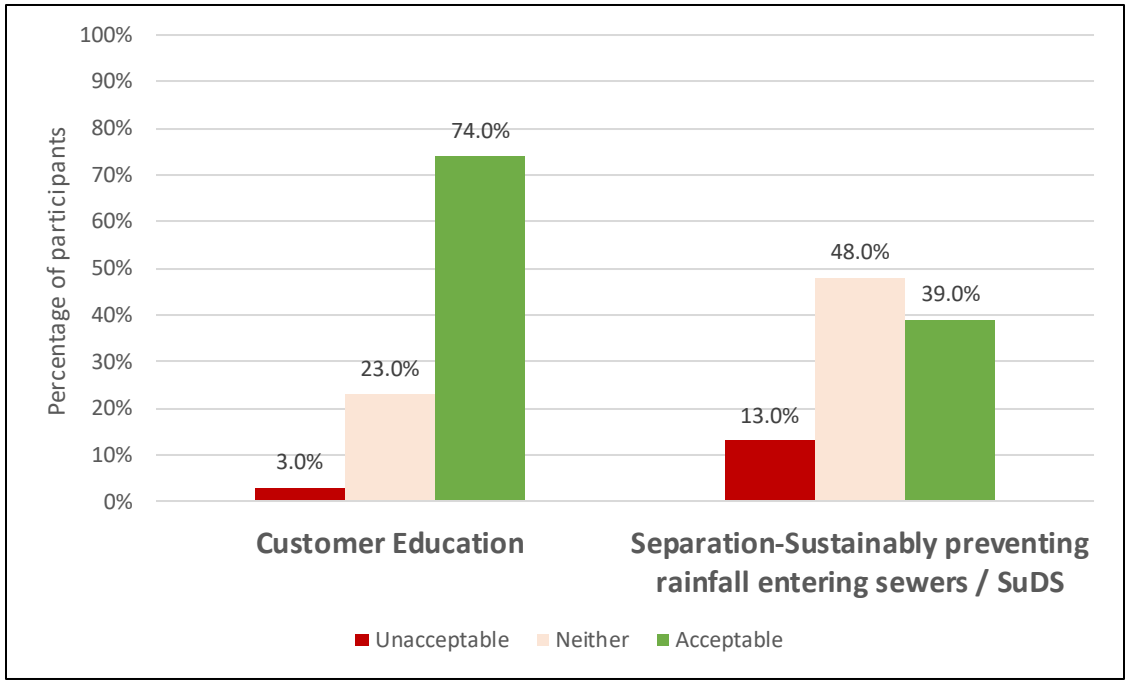
Pre-treatment initiatives and permitting

COST	NEGATIVE ENVIRONMENTAL IMPACT
Too expensive	*Due to poor impact on local rivers.*
High cost for too little benefit	*Little benefit to rivers and somewhere between not possible everywhere and may not work are unacceptable outcomes.*
The cost to me is unacceptable	*Because this is having a massive impact on our rivers and wildlife*
Too expensive. People do not have the resources for increased costs and too many people are just above levels for help	*It looked to me like flooding would be as bad and all the others would not be too good, except emissions would be better*

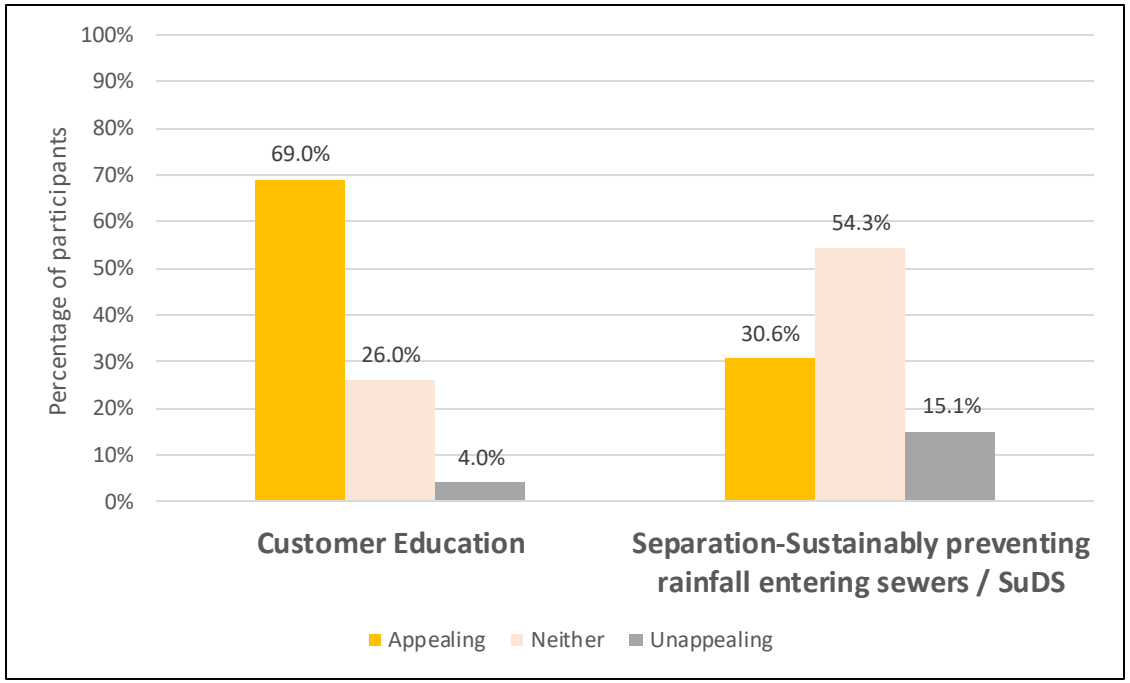
Accent

SP3 results: Customer side Management

Acceptability of Customer side Management options



Appeal of Customer side Management options



ACCEPTABILITY: Much higher percentage found Customer Education acceptable compared to Separation/SuDS
APPEAL: Much higher percentage found Customer Education appealing compared to Separation/SuDS

Why unacceptable?

Customer Education

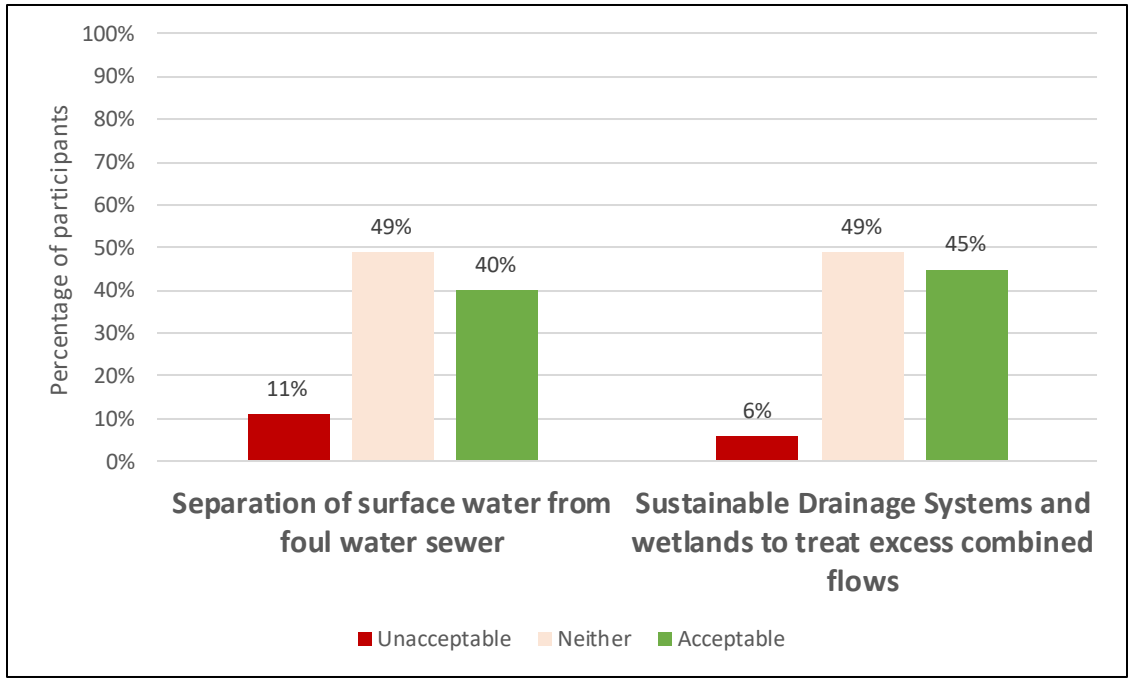
NOT NECESSARY	PREFER MONEY USED FOR DIFFERENT THINGS
People should know the impact of what goes down the drains and toilets.	*Not enough benefit on rivers.*
Because most people with common sense don't abuse the waste water system. Those who do are those who will continue to do so, whether or not an education programme is undertaken. Don't waste money on trying to educate the stupid.	*I would prefer to see a bigger advantage given to the protection of rivers.*
This would be a total waste of time and resources.	*Because it does nothing to prevent the company to dump raw sewage in the rivers.*
Some people already have a good knowledge of what they should and should not be doing regarding the use of their water supply. Sadly, there are too many people in this country that do not care a dam about 'doing the right thing'. Therefore it is a waste of time and money. Personally, I think it is a good idea, but too many people wouldn't even be bothered to read it.	

Separation

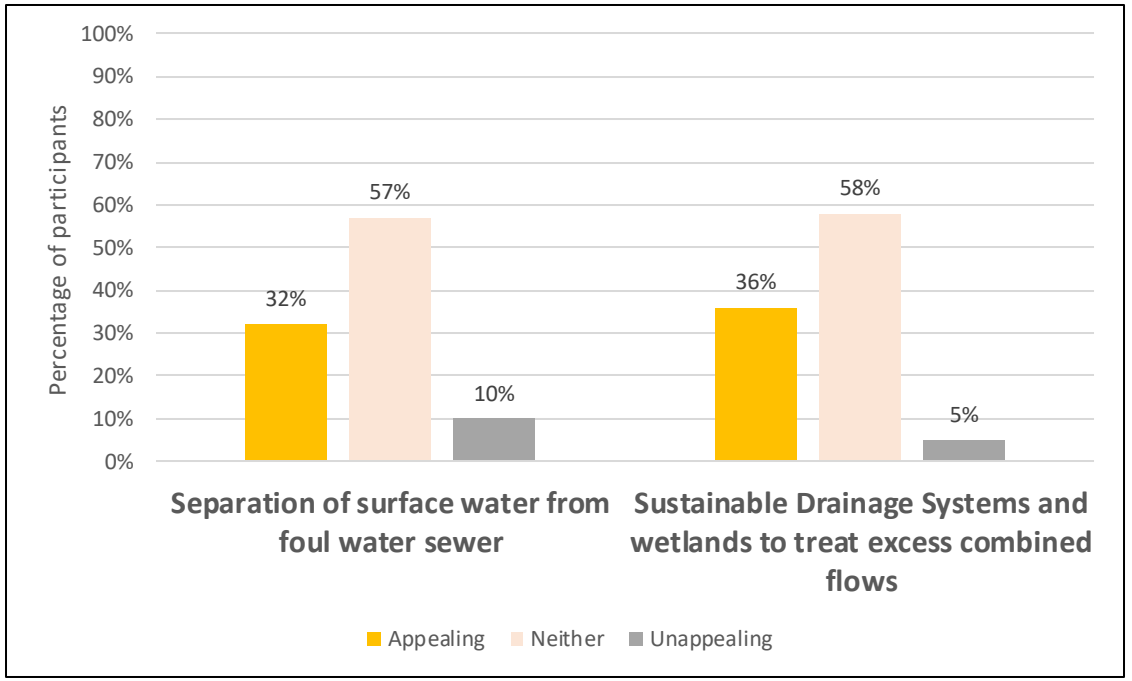
COST	NO SIGNIFICANT IMPACT
High cost.	*There doesn't seem to be any significant benefit of it.*
Put simply - the cost. I have had personal experience of this. With permission from Wessex Water, my surface water from my garage is directed to the sewerage system as the alternative cost of separation at that time was prohibitive.	*Where will the rain water go? Living somewhere that floods already, it is of concern that flooding will become more prevalent.*
Increasing the cost of the bills just because people are not properly educated on what they can and cannot flush down the toilet is simply unacceptable.	*Little improvement on any areas.*
Separation appears high cost with little benefit.	*Expensive; significant environmental impact. Customers are not targeted to change habits.*

SP3 results: Surface water Management

Acceptability of Surface water Management options



Appeal of Surface water Management options



ACCEPTABILITY: Higher percentage found sustainable drainage systems acceptable compared to separation of surface water from foul water

APPEAL: Higher percentage found sustainable drainage systems appealing compared to separation of surface water from foul water

Why unacceptable?

Separation of surface water from foul water sewer

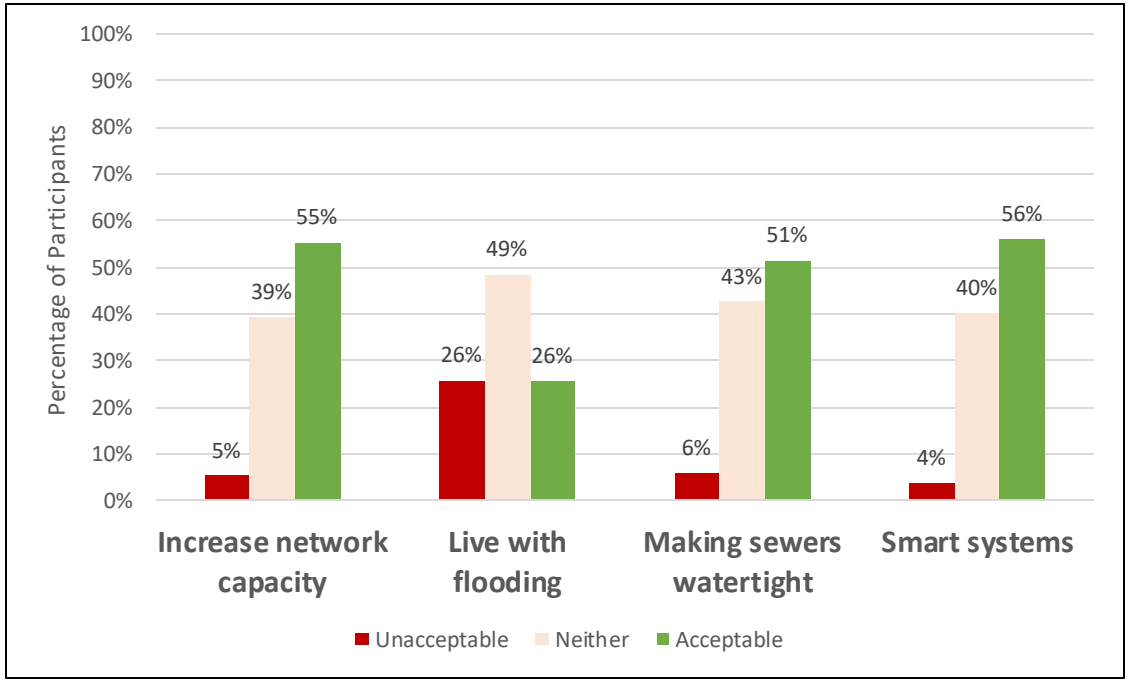
NOT "GREEN" ENOUGH	HIGH COST
Doesn't seem to be green enough, safe for environment.	*High emissions for relatively high cost*
Its not acceptable as the graphic implies that the carbon footprint impact would be significant.	*High cost implication*
No reduction in CO2 emissions.	*Sounds overkill, very expensive and very disruptive. Not climate friendly*
I'm worried about carbon emissions at a time when we urgently need to be reducing them.	

Sustainable Drainage Systems and Wetlands to treat excess combined flows

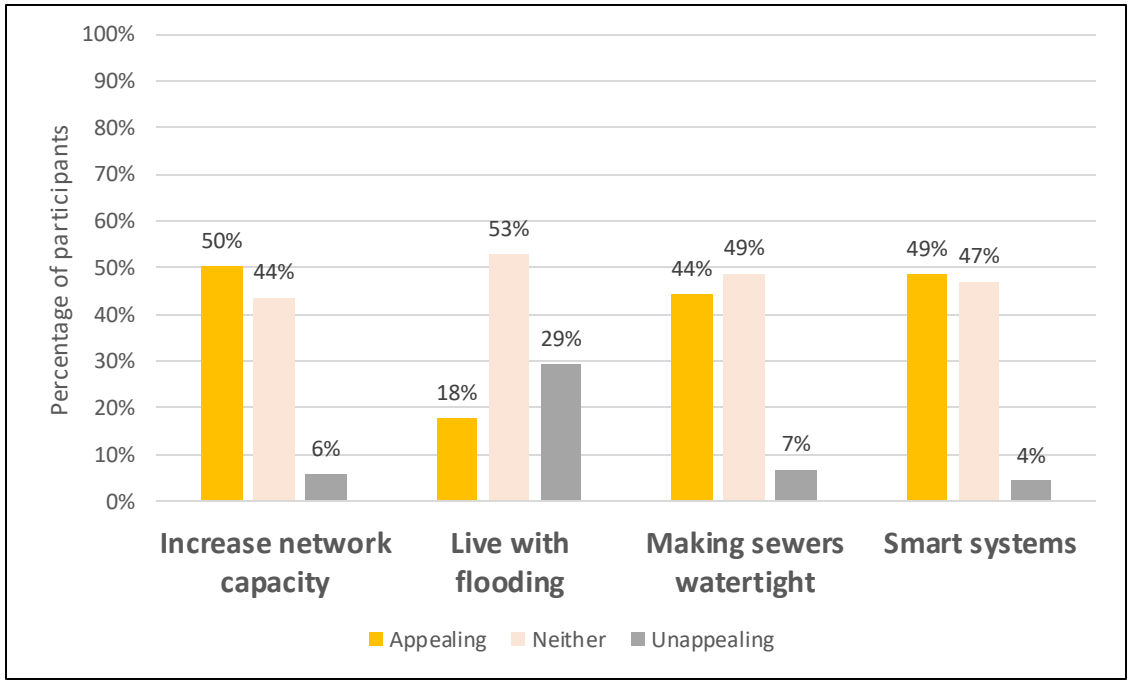
LITTLE IMPACT WITH HIGH COST	SHOULD NOT INVOLVE NATURE HABITAT
Because the positives don't seem to warrant the negatives. Higher carbon footprint with little impact on river quality.	*Sewage should be treated in a closed environment. Using wetlands will contaminate soil and harm aquatic life. If a separate surface system is used there is less chance of contamination.*
Not enough impact and too expensive	*Because I do not agree with rivers and seas being adversely affected by water waste*
	I'm not sure I have fully understood the concept, but it sounds like rainwater could be contaminated and passed straight back into the rivers which is not ok.
	It will inevitably affect wetlands negatively

SP3 results: Combined and Foul Sewer systems

Acceptability of Combined and Foul Sewer options



Appeal of Combined and Foul Sewer options

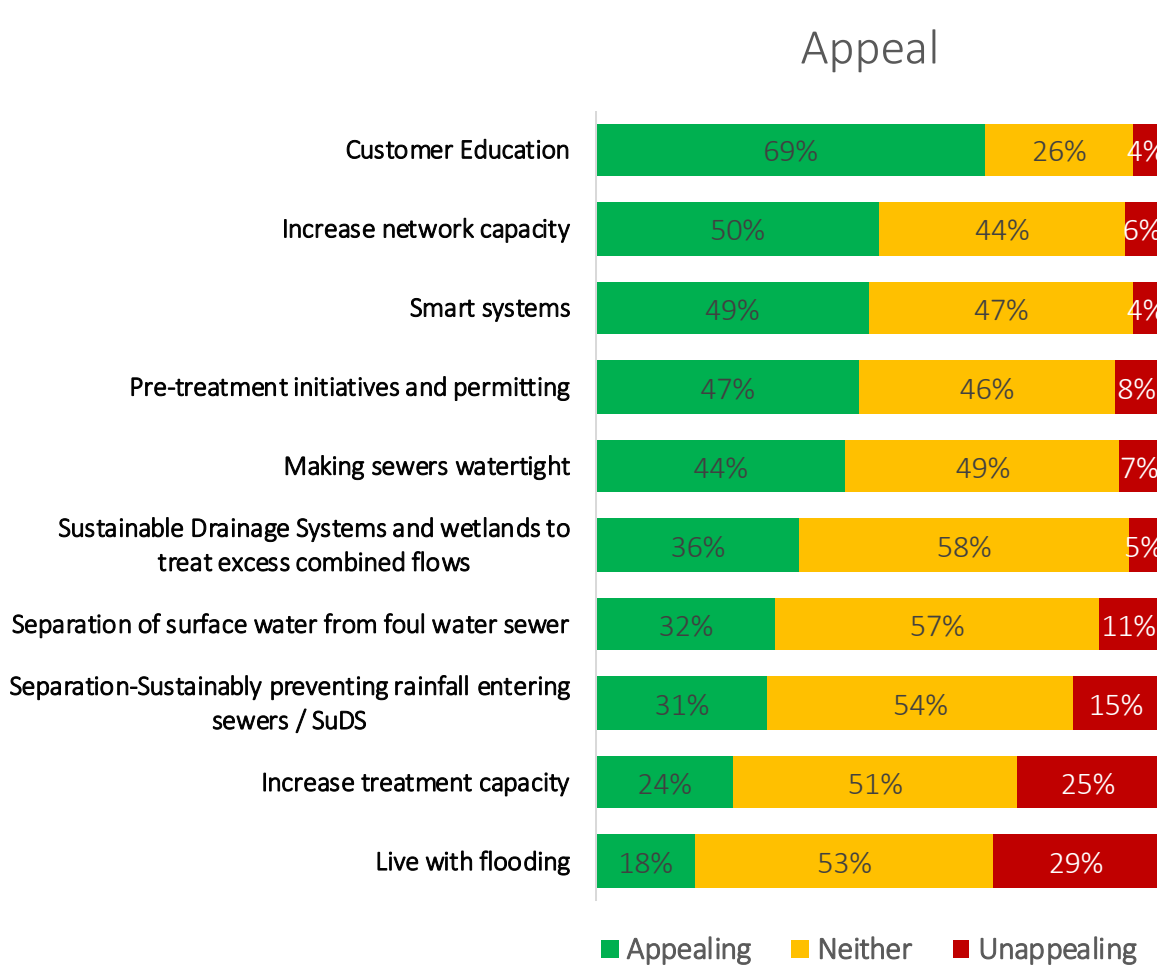


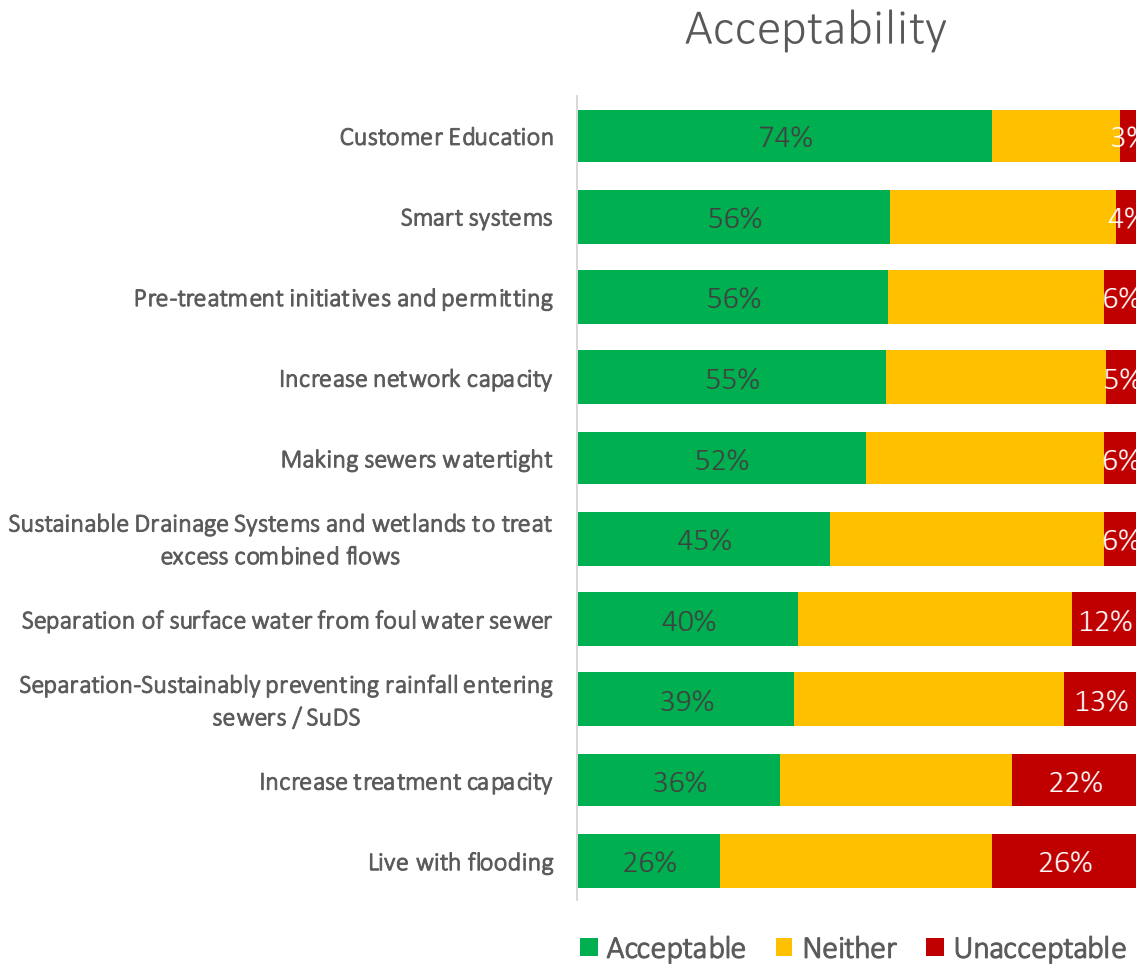
ACCEPTABILITY: Most acceptable Smart systems & Increase in network capacity followed by Making sewers watertight and Live with flooding
APPEAL: Most appealing Increase in network capacity & Smart systems followed by Making sewers watertight and Live with flooding

Why unacceptable?

Increase network capacity / build underground tanks	***NOT ENOUGH BENEFIT*** • *Not enough benefit compared to other options* • *Too many negatives for too little benefit*	***COST*** • *the cost and the disruption that is causes is unacceptable to me* • *It costs too much*	***NEGATIVE IMPACTS*** • *Because it causes issue to the impact on rivers* • *Could lead to more issues like blockages, extra work for employees etc*
Live with flooding, but reduce impact of flooding (mitigation)	***FLOODING IS STILL A BIG ISSUE*** • *Doesn't Improve the flooding situation* • *Flooding has devastating impacts on people and is very costly.* • *'Floods would still occur*	***NEGATIVE IMPACT TO RIVER*** • *Bad for rivers.* • *River water quality is of upmost importance* • *Because the impact on our rivers is too high a risk.*	
Making sewers watertight to prevent groundwater flooding	***NO OUTSTANDING BENEFITS*** • *no outstanding benefits to any area* • *Because the benefits don't seem that great* • *Poor outcomes on all indicators*	***NOT COST EFFECTIVE*** • *Too expensive* • *Not cost effective* • *Expensive as heck and too much of a risk for that to be passed to consumers*	***NEGATIVE IMPACTS*** • *Because of environment pollution* • *that will make the groundwater not fit for use.* • *Again not worth the negative impact on other aspects*
Smart systems	***NOT ENOUGH POSITIVE IMPACTS*** • *Not much improvement to river water quality and not enough reduction in flooding.* • *No positive impact on river quality*	***COST & BENEFIT NOT ACCEPTABLE*** • *Not enough cost benefit for outlay* • *Cost and complicated* • *Minimal improvements to services at high cost.*	***LITTLE FAITH IN HIGH TECH*** • *Smart things can easily go wrong and are susceptible to cyber crimes* • *Ah, another high tech disaster & cost overrun looms. Start with something simple like a smart motorway or NHS*

Summary of GO support





Conclusions

Conclusions

Overall, there are good grounds for considering the valuations to be robust and reliable for use in Wessex Water's Drainage and Wastewater Management Plan.

Overall, there are several indications of validity and reliability of the valuations.

- There were v**ery few instances of non-trading behaviour** and participants found that **choices were easy to understand**, and they were **able to make comparisons** between the options presented to them.
- **Results and valuations varied in line with expectations:**
  - Customers preferred flooding away from their houses, rainwater sewer flooding to foul/combined sewer flooding and less frequent flooding.
  - Customers' willingness to pay for DWMP outcomes such as reduced flooding and reduced carbon emissions increased with an increase in the reduction rate.
  - Customers' willingness to pay for river improvement increased with an increase in the improvement rate and
  - Customers' willingness to pay decreased with an increase in the flooding, carbon emissions and local traffic congestion rates.

Almost no sig differences

Differences in Mean WTP values across most customer segments i.e., region, age, gender and segmentation code **were not statistically significant** (at 5%) with very few exceptions

Timeline – when to invest

Customers preferred that WW invests in the period 2025-2030 compared to the status quo situation, all else equal.

Other options

Majority of participants found **"Pre-treatment initiatives and permitting"** acceptable compared to "Increased treatment capacity"; "**Customer Education**" acceptable compared to "Separation/SuDS" and "Smart Systems" & "Increase in Network Capacity" acceptable followed by "Making Sewers Watertight" and "Live With Flooding".

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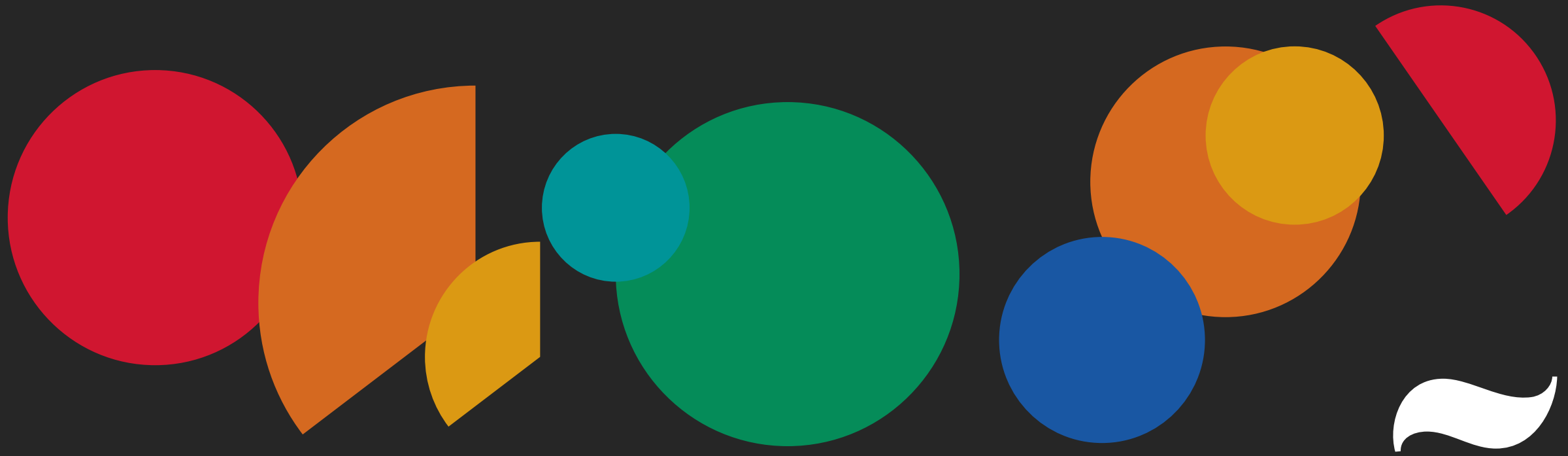
Thank you



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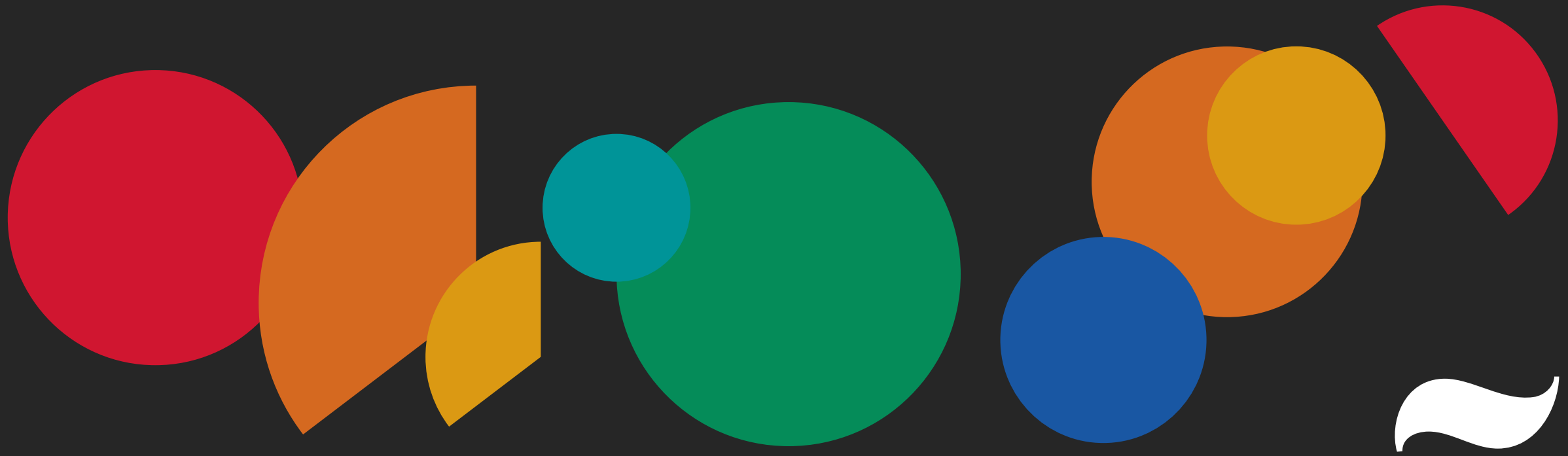
Accent PJM economics



APPENDIX

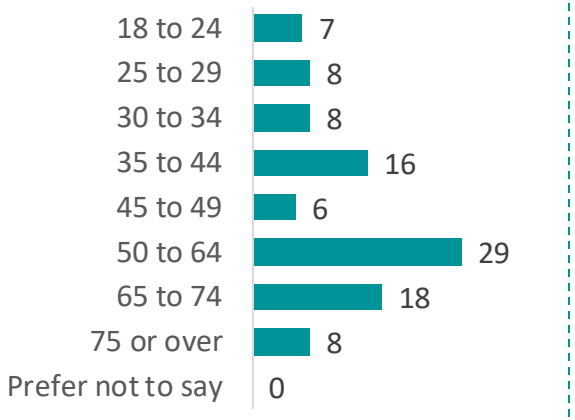
DEMOGRAPHIC AND MORE

DEMOGRAPHIC BREAKDOWN – 1,855 INTERVIEWS WITH HOUSEHOLD CUSTOMERS

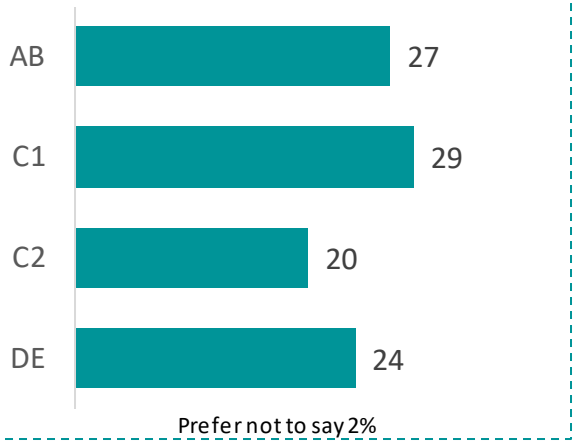
SAMPLE OVERVIEW

% participants

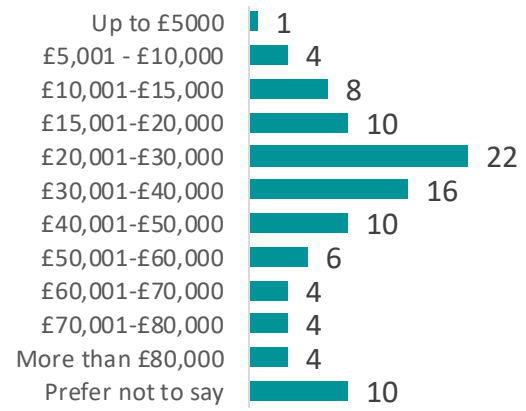
AGE GROUP



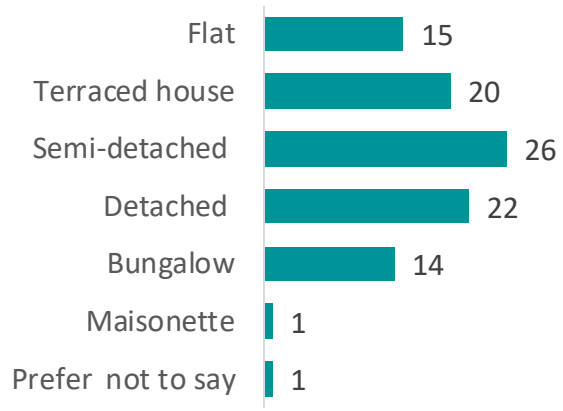
SEG



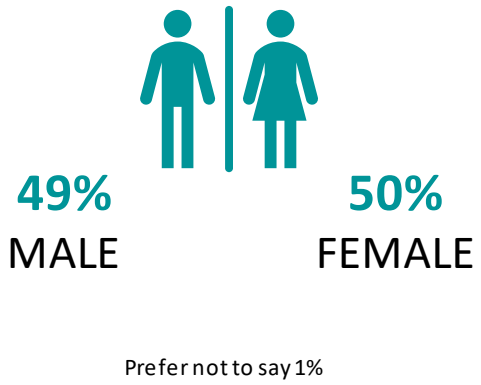
INCOME



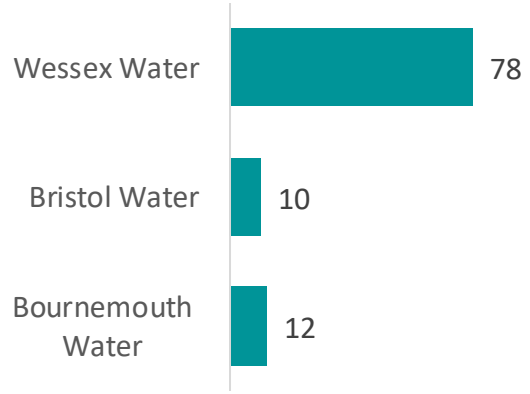
ACCOMODATION



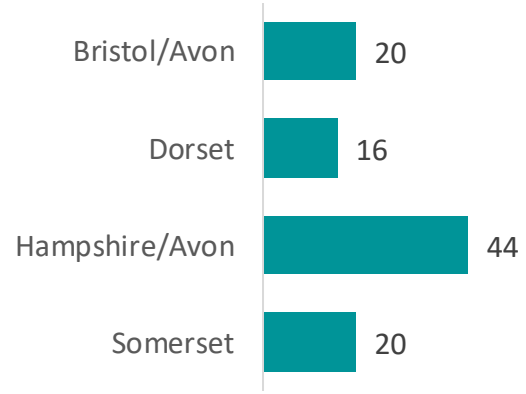
GENDER



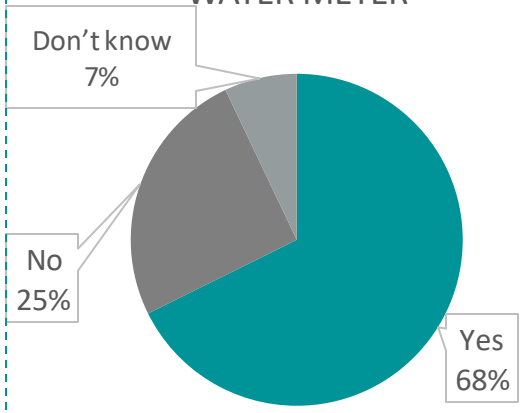
CLEAN WATER SUPPLY AREA



REGION



WATER METER



Weighted base size: n=1855. Result in percentage unless specified otherwise. Percentage may not total 100 due to rounding.

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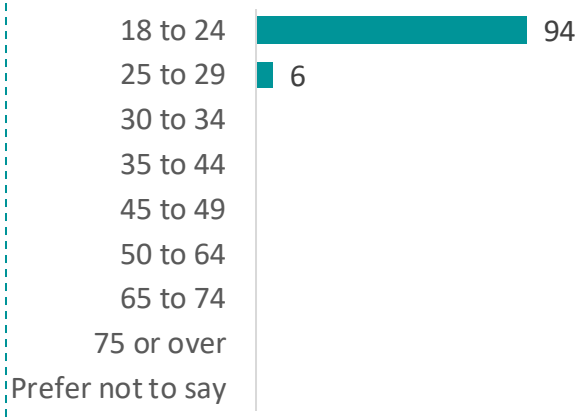
DEMOGRAPHIC BREAKDOWN – 47 INTERVIEWS WITH FUTURE CUSTOMERS

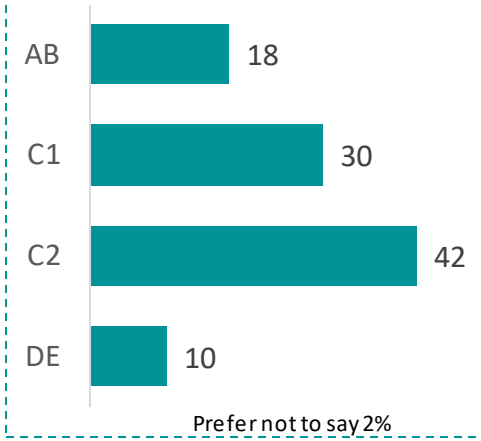
SAMPLE OVERVIEW

% participants

AGE GROUP

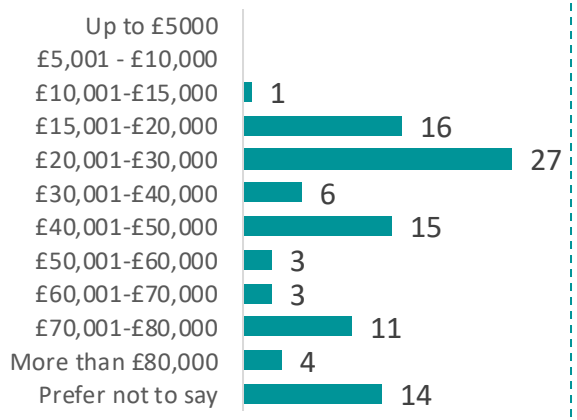


SEG

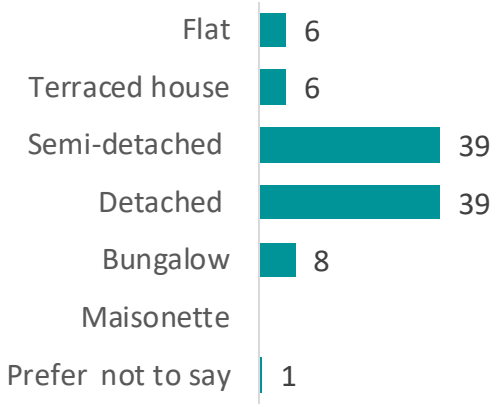


Prefer not to say 2%

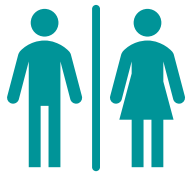
INCOME



ACCOMODATION



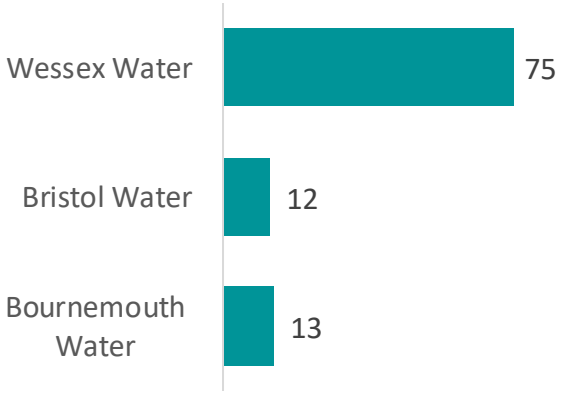
GENDER



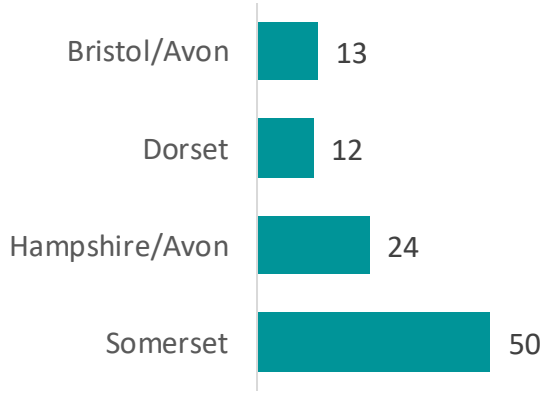
21% MALE

79% FEMALE

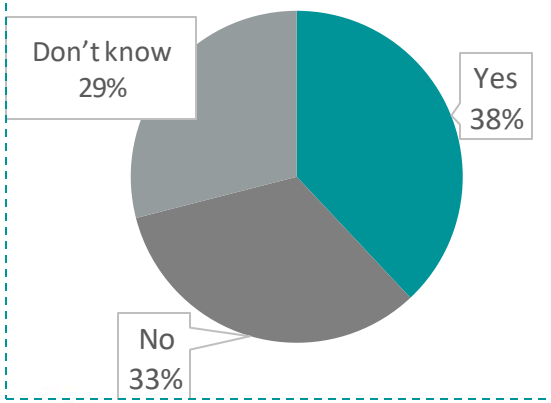
CLEAN WATER SUPPLY AREA



REGION



WATER METER



Weighted base size: n=47. Result in percentage unless specified otherwise. Percentage may not total 100 due to rounding.

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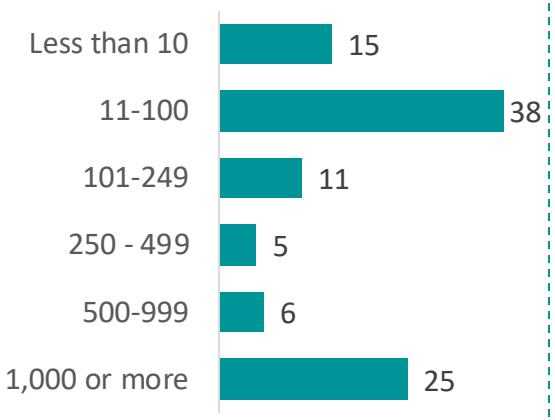
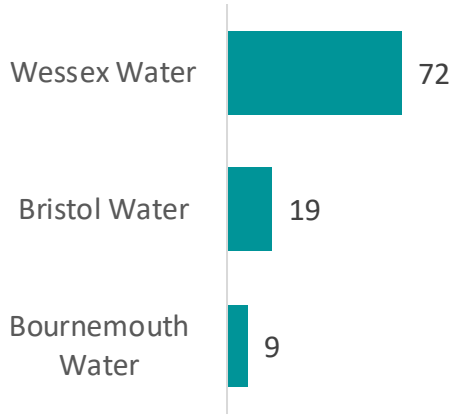
SAMPLE BREAKDOWN – 279 INTERVIEWS WITH NON HOUSEHOLD CUSTOMERS

SAMPLE OVERVIEW

SIZE OF BUSINESS



CLEAN WATER SUPPLY AREA

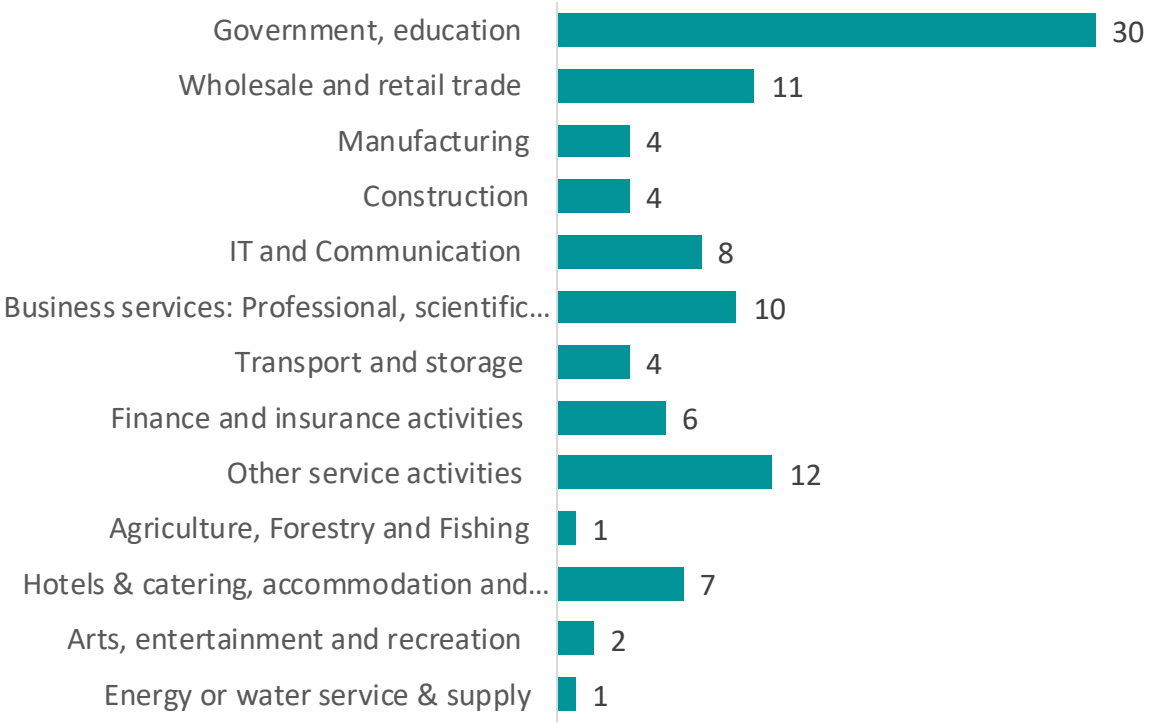


NUMBER OF SITES IN THE UK

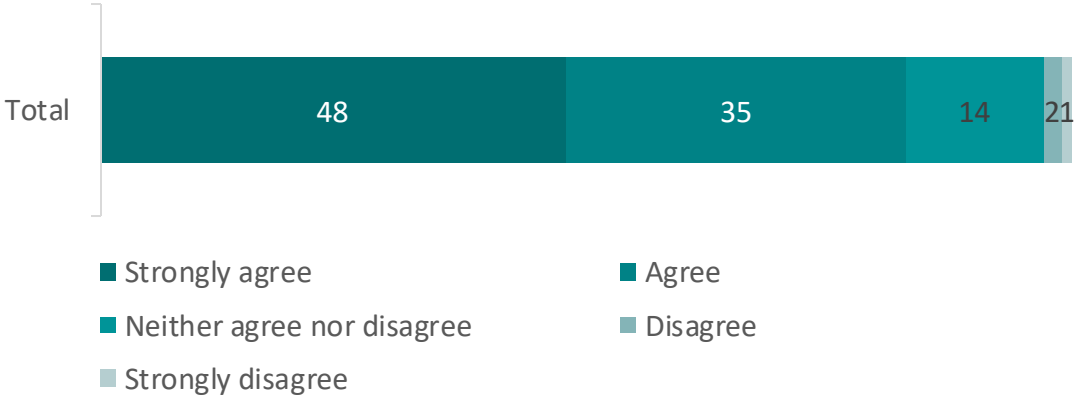
44% ONE SITE

50% MORE THAN ONE

CORE ACTIVIY



WATER DEPENDENCE FOR OPERATION



Weighted base size: n=279. Result in percentage unless specified otherwise. Percentage may not total 100 due to rounding.

KEY METRICS - OVERALL SATISFACTION
DEMOGRAPHIC DIFFERENCES

2%
Bottom 5 box

OVERALL SATISFACTION

71%
Top 3 box

Mean score 7.9/10

Significant differences (mean score)		
Supply Area – Bournemouth (7.4)	Sig lower than	Supply Area – Dual (7.9) & Bristol (8.0)
Low Trust (4.7) & Mid trust (6.8)		High Trust (8.8)
Low VFM (5.3) and Mid VFM (7.0)		High VFM (8.6)
Experienced problem (7.6)		Not experienced problem (8.1)
Age: 18-29 (7.8), 30-44 (7.7), 45-64 (7.8)		Age: 65+ (8.1)
Male (7.7)		Female (8.0)
Water Meter – Not Measured (7.7)		Water Meter – Measured (8.0)

Q28. How satisfied would you say you are with the overall service provided by Wessex Water? (10 point scale) Weighted base size: n=2,181

KEY METRICS - TRUST WESSEX WATER
DEMOGRAPHIC DIFFERENCES

Mean score 7.6/10

Significant differences (mean score)		
Future Customer (6.8)	Sig lower than	Household (7.6) & Non-household Customer (7.7)
Supply Area – Bournemouth (7.3)		Supply Area – Dual (7.6) & Bristol (7.8)
Low SAT (2)		Mid SAT (6.1) & High SAT (8.6)
Low VFM (4.6) & Mid VFM (6.6)		High VFM (8.3)
Experienced problem (7.2)		Not experienced problem (7.9)
Didn't Contact Wessex Water (7.5)		Contacted Wessex Water (7.7)
Age: 18-29 (7.4), 30-44s (7.5) & 45-64s (7.6)		Age: 65+ (7.8)

Q29. How much do you trust Wessex Water? (10 point scale) Weighted base size: n=2,181

KEY METRICS - VALUE FOR MONEY
DEMOGRAPHIC DIFFERENCES

8%
Bottom 2 box

64%
Top 2 box

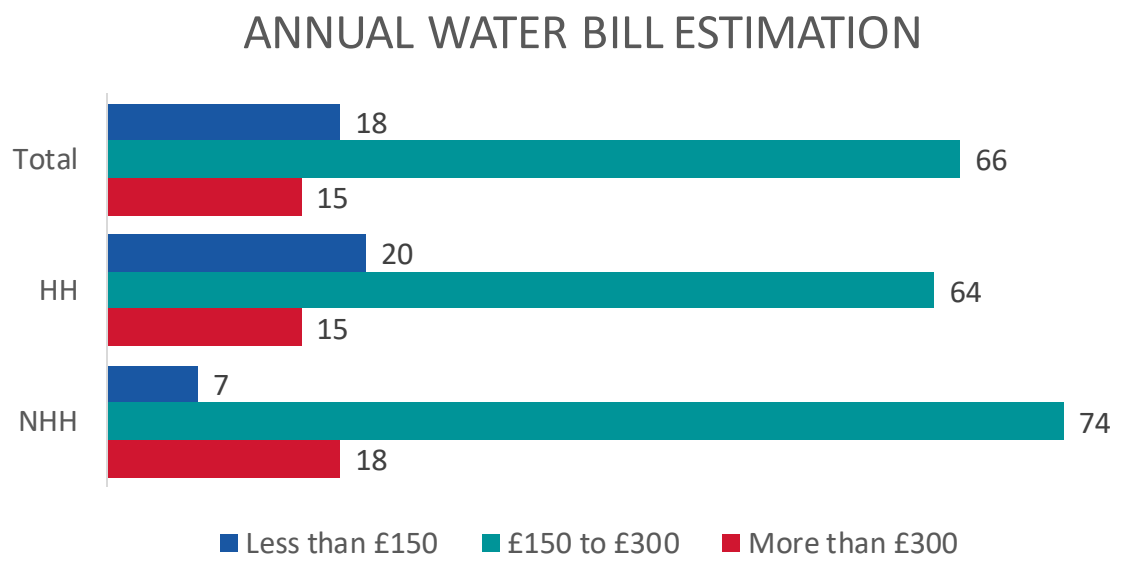
Mean score 3.8/5

Significant differences (mean score)		
Future (3.7) & Household (3.8) customers	Sig lower than	Non-household customer (3.9)
Supply Area – Bournemouth (3.6)		Supply Area – Bristol (3.9) & Dual (3.8)
Low SAT (1.7) & Mid SAT (3.3)		High SAT (4.1)
Low Trust (2.3)		Mid Trust (3.4) & High Trust (4.2)
Experienced problem (3.6)		Not experienced problem (3.9)
SEG – AB (3.7), C1 (3.7) & C2 (3.8)		Seg – DE (3.9)
Male (3.7)		Female (3.8)
Water Meter – Not Measured (3.6)		Water Meter – Measured (3.8)

Q30. How satisfied are you with the value for money of the services you receive? (5 point scale) Weighted base size: n=2,181

KEY METRICS – BASE BILL

BILL LEVELS & DEMOGRAPHIC DIFFERENCES



Significant differences **Less than £150**		
Non-household (7%)	Sig lower than	Household (20%)
Supply Area – Dual (18%) & Bristol (15%)		Supply Area – Bournemouth (25%)
Digitally excluded (11%)		Not digitally excluded (19%)
Low SAT (6%) & Mid SAT (12%)		High SAT (22%)
Low Trust (15%) & Mid Trust (14%)		High Trust (23%)
Low VFM (15%) & Mid VFM (14%)		High VFM (23%)
Experience a problem (15%)		Didn't experience a problem (20%)
Age – 18-29 (11%) & 30-44 (15%)		Age – 45-64 (22%) & 65+ (26%)
Water Meter – Not measured (7%)		Water Meter – Measured (24%)
Children at home (10%)		No children at home (20%)

Significant differences **More than £300**		
Digitally excluded (11%)	Sig lower than	Not digitally excluded (19%)
VFM – Low (15%) & High (14%)		VFM – Mid (19%)
Didn't experienced a problem (12%)		Experienced a problem (21%)
Didn't contact Wessex Water (12%)		Contacted Wessex Water (17%)
Age – 45-64 (15%) & 65+ (10%)		Age – 18-29 (17%) & 30-44 (20%)
SEG – DE (10%)		SEG – AB (17%), C1 (16%) & C2 (17%)
No children at home (13%)		Children at home (25%)

Significant differences **£150 to £300**		
Household (64%)	Sig lower than	Non-household (74%)
Not digitally excluded (65%)		Digitally excluded (82%)
High SAT (62%)		Low SAT (86%) & Mid SAT (73%)
High trust (63%)		Low Trust (74%) & Mid Trust (70%)
Age – 30-44 (65%), 45-64 (63%) & 65+ (63%)		Age – 18-29 (72%)
Contacted Wessex Water (64%)		Didn't contact Wessex Water (70%)
Water Meter – measured (61%)		Water Meter – not measured (75%)

Qbasebill. Base bill. Weighted base size: n=2,181

Stated preference details

Measuring relative impacts of flooding

SP1 choice exercise results

Choice	Coef.	Std.Err	Z	p	Lower	Upper
Mean						
Location of flooding						
location_internal (=base)	[omitted]					
location_out_morethan10	-1.940	0.102	-19.05	0	-2.140	-1.741
location_out_lessthan10	-2.090	0.107	-19.5	0	-2.301	-1.880
location_in_road	-2.749	0.133	-20.61	0	-3.010	-2.487
location_nearestpark	-3.630	0.179	-20.3	0	-3.980	-3.279
Type of flooding						
type_foul (=base)	[omitted]					
type_rainwater	-1.827	0.093	-19.56	0	-2.010	-1.644
Frequency of flooding						
freq_twiceyear (=base)	[omitted]					
freq_onceyear	-0.164	0.062	-2.62	0.009	-0.286	-0.041
freq_one_in_5years	-0.835	0.068	-12.32	0	-0.968	-0.702
freq_one_in_10years	-1.417	0.080	-17.82	0	-1.573	-1.261
freq_one_in_20years	-2.173	0.103	-21.07	0	-2.375	-1.971
Std deviation						
location_out_morethan10	0.086	0.327	0.26	0.792	-0.555	0.727
location_out_lessthan10	0.200	0.182	1.1	0.272	-0.156	0.556
location_in_road	0.398	0.158	2.52	0.012	0.089	0.707
location_nearestpark	1.233	0.094	13.16	0	1.049	1.417
type_rainwater	1.212	0.059	20.37	0	1.095	1.328
freq_onceyear	0.420	0.135	3.12	0.002	0.156	0.684
freq_one_in_5years	-0.231	0.174	-1.33	0.184	-0.572	0.110
freq_one_in_10years	-0.120	0.108	-1.12	0.264	-0.332	0.091
freq_one_in_20years	-1.010	0.093	-10.87	0	-1.193	-0.828
Pseudo R^2	0.12					

Model results: worst to least impactful

Location:

- Inside customers' home
- Outside customers' home but within the property boundary:
  - more than 10 square metres affected
  - less than 10 square metres affected
- In customers' road
- In nearest field/park

Type

- Foul/combined sewer flooding
- Rainwater sewer flooding

Frequency

- Twice in one year
- Once a year
- Once in 5 years
- Once in 10 years
- Once in 20years

- Signs and relative magnitudes of model coefficients broadly in line with expectation.
- Levels of precision good with all coefficients statistically significant at the 5% level.

When Wessex Water should invest

SP6 choice exercise results

Tabulation of Options chosen

Options	Frequency	Percent
Option A: Same as now	232	21.1%
Option B1: Invest by 2030	478	43.6%
Option B2: Invest by 2035	167	15.2%
Option B3: Invest by 2050	220	20.1%

Conditional Logit Model

Choice	Coef.	Std.Err	Z	p	Lower	Upper
sp6bill	-0.0001	0.0001	-0.69	0.493	-0.0003	0.0001
Option B1	0.7441	0.0879	8.46	0.00	0.5718	0.9165
Option B2	-0.2016	0.1052	-1.92	0.055	-0.4078	0.0045
Option B3	-0.0555	0.1017	-0.55	0.585	-0.2548	0.1439
Number of obs	4388					
No. respondents	1097					
Log-likelihood	-1430.41					
Pseudo R^2	0.06					

Results show participants' preferences.

- Option B1 is most preferred , followed by Option A, Option B3 and Option B2.
- Bill increase does not seem to have a significant impact on choice.

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Preferences and WTP for outcomes

SP2 choice exercise Model results

Choice	Coef.	Std.Err	Z	p	Lower	Upper
Mean						
billpchange_cont	-4.685	0.270	-17.36	0	-5.213	-4.156
flooding_plus25	-0.868	0.088	-9.82	0	-1.041	-0.694
flooding_plus10	-0.523	0.063	-8.33	0	-0.646	-0.400
flooding_minus10	0.329	0.063	5.18	0	0.204	0.453
flooding_minus25	0.762	0.080	9.57	0	0.606	0.918
carbon_plus5000	-0.897	0.095	-9.47	0	-1.083	-0.712
carbon_plus1000	-0.270	0.059	-4.61	0	-0.385	-0.155
carbon_minus500	0.383	0.059	6.45	0	0.266	0.499
carbon_minus1000	0.680	0.063	10.87	0	0.557	0.803
rivers_plus5	0.200	0.058	3.45	0.001	0.086	0.313
rivers_plus25	0.478	0.060	7.97	0	0.360	0.595
rivers_plus50	0.817	0.069	11.81	0	0.682	0.953
rivers_plus100	1.014	0.082	12.36	0	0.853	1.175
disruption_plus24	-0.541	0.069	-7.86	0	-0.676	-0.406
disruption_plus12	-0.272	0.060	-4.54	0	-0.389	-0.154
disruption_plus6	-0.139	0.050	-2.78	0.005	-0.237	-0.041
Std deviation						
flooding_plus25	1.419	0.098	14.46	0	1.226	1.611
flooding_plus10	-0.254	0.177	-1.44	0.151	-0.601	0.093
flooding_minus10	0.210	0.125	1.68	0.093	-0.035	0.454
flooding_minus25	0.620	0.107	5.81	0	0.411	0.829
carbon_plus5000	1.287	0.103	12.53	0	1.086	1.489
carbon_plus1000	0.261	0.129	2.02	0.044	0.007	0.515
carbon_minus500	0.387	0.108	3.59	0	0.176	0.598
carbon_minus1000	-0.534	0.100	-5.33	0	-0.731	-0.338
rivers_plus5	-0.160	0.131	-1.23	0.22	-0.416	0.096
rivers_plus25	-0.330	0.112	-2.95	0.003	-0.549	-0.111
rivers_plus50	-0.330	0.110	-3.02	0.003	-0.545	-0.116
rivers_plus100	-0.447	0.096	-4.67	0	-0.635	-0.259
disruption_plus24	0.328	0.113	2.9	0.004	0.106	0.549
disruption_plus12	0.651	0.089	7.31	0	0.477	0.825
disruption_plus6	0.117	0.113	1.04	0.299	-0.104	0.338
Pseudo R^2	0.12					

Signs and relative magnitudes of model coefficients broadly in line with expectation. Levels of precision good with coefficients statistically significant at the 5% level. Significant variation in customers' preferences.

Mixed Logit Model

Bill percentage changes

Participants prefer less costly options, all else equal.

Sewer flooding incidents: Best to worst

- 25% decrease in flooding
- 10% decrease in flooding
- Flooding stays the same as now (base level)
- Flooding increases by 10%
- Flooding increases by 25%

Carbon emissions: Best to worst

- Emissions reduce by 1,000 tonnes/year (eq 60 households)
- Emissions reduce by 500 tonnes/year (eq 30 households)
- Emissions stay the same as now (base level)
- Emissions increase by 1,000 tonnes/year (eq to 60 households)
- Emissions increase by 5,000 tonnes/year (eq to 300 households)

Impact on rivers: Best to worst

- 100km river improved to fit-for-swimming quality
- 50km river improved slightly [improved treatment and 40% reduction of storm overflows]
- 25km river improved slightly [improved treatment and 25% reduction of storm overflows]
- 5km river improved slightly [improved treatment]
- Impact is same as now (base level)

Local disruption: Best to worst

- Local disruption stays the same (base level)
- Increased local traffic congestion for 6 months
- Increased local traffic congestion for 12 months
- Increased local traffic congestion for 24 months

Drainage and Wastewater Management Plan Research

Quantitative Findings

January 2022

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V1

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Executive Summary

Introduction

Accent and PJM Economics were commissioned by Wessex Water to conduct a programme of qualitative and quantitative research to explore customer and stakeholder views and values on issues relating to the company's Drainage and Wastewater Management Plan (DWMP). This research forms part of a wider customer engagement strategy that will underpin the development of Wessex Water's Business Plan for PR24.

The objectives of the present research were to understand customer views on issues related relating to wastewater drainage, including the type and frequency of sewer flooding; willingness to pay for improvements in service; the timing of bill and service impacts; and attitudes towards potential generic options (GO) for inclusion in the DWMP.

A multi-stage iterative approach was followed for developing, testing and implementing the research. In the initial phase, a programme of qualitative engagement was carried out, which focused on attitudes towards GOs and potential enhancements to sewer flooding service levels. This was followed by a programme of quantitative engagement that included two stated preference surveys of Wessex Water customers. This report focuses on the results from these two surveys but also includes a discussion of these in light of the findings from the qualitative research.

Survey Design and Administration

Two stated preference surveys were conducted in order to robustly address the research objectives. The first survey included three choice exercises:

- A pairwise choice experiment focused on the relative impact of different types of sewer flooding on customers
- A contingent valuation exercise to measure customers' willingness to pay for a package of sewer flooding service level improvements
- A choice experiment to measure customers' preferred timing of investment in sewer flooding service level improvements.

The second survey included a further two choice exercises:

- A pairwise choice experiment to measure customers' preferences and willingness to pay with respect to different impacts of the GOs
- An exercise focused on measuring customer support for the various GOs.

The majority of interviews within the quantitative phase, were conducted online among Wessex Water domestic customers', both from panel partners and from sample provided by Wessex Water. These interviews also included non-household and vulnerable customers.

The online interviews were supplemented with face to face interviews to ensure coverage amongst the hard-to-reach, vulnerable and digitally disengaged customers. A total of 1,097 completed interviews were achieved in the first survey (Survey A) and a total of 1,084 completed interviews were achieved in the second survey (Survey B). The data were weighted to be representative of the profile of Wessex Water customer base.

Key Findings

The key findings from the research were as follows:

- Mean WTP for the reduced sewer flooding scenario shown was estimated to be around 19% of the annual wastewater bill per year, with a 95% confidence interval of [17.9%, 21.7%]. For an average household paying an annual wastewater bill of £223, this implies a mean WTP of £42.37 per year, with a 95% confidence interval of [£39.91, £48.39].

- Mean WTP estimates for avoiding each type of sewer flooding on a per-incident basis are shown in the table below. These show the expected ordering, with mean WTP for avoiding foul/combined sewer flooding much higher than for avoiding rainwater only sewer flooding; and, for both types of flooding, values are the highest when flooding is closer to customers' home.

Table 1: WTP values per avoided sewer flooding incident, per property affected

Options	WTP (£/year/avoided foul/combined sewer flooding incident)	WTP (£/year/avoided rainwater only sewer flooding incident)
Inside customers' home	£227,378	£36,608
Outside customers' home within property boundary with >10 sq. m affected	£32,663	£5,259
Outside customers' home within property boundary with <10 sq. m affected	£28,093	£4,523
In customers' road	£14,635	£2,356
In customers' nearest field or park	£7,971	£1,283

NB: Values for external flooding should be multiplied by the number of properties affected by each type of incident.

- With regard to the timing of investment, customers preferred that Wessex Water should invest in the immediate period (2025-2030) rather than spread investment over a longer period.

- Customer WTP values for the outcomes that could be achieved through the DWMP are shown presented in the table below. The ordering of values is as expected in all cases, with greater improvement resulting in higher values and greater negative impacts resulting in higher compensating bill reductions required.

Table 2: WTP values for Wessex Water DWMP outcomes

Wessex Water DWMP outcomes	WTP (% bill change)	WTP (£/year)
Flooding		
25% increase in flooding	-18%	-£40.59
10% increase in flooding	-11%	-£24.98
10% decrease in flooding	7%	£15.61
25% decrease in flooding	16%	£36.57
Carbon Emissions		
Emissions increase by 5,000 tonnes/year	-18%	-£39.92
Emissions increase by 1,000 tonnes/year	-6%	-£12.71
Emissions reduce by 500 tonnes/year	8%	£18.29
Emissions reduce by 1000 tonnes/year	15%	£32.34
River Improvement		
5km river improved slightly	4%	£9.37
25km river improved slightly	10%	£22.97
50km river improved slightly	17%	£38.80
100km river improved to fit-for-swimming quality	22%	£47.95
Local disruption		
Increased local traffic congestion: 6 months	-12%	-£26.31
Increased local traffic congestion for 12 months	-6%	-£12.71
Increased local traffic congestion for 24 months	-3%	-£6.47

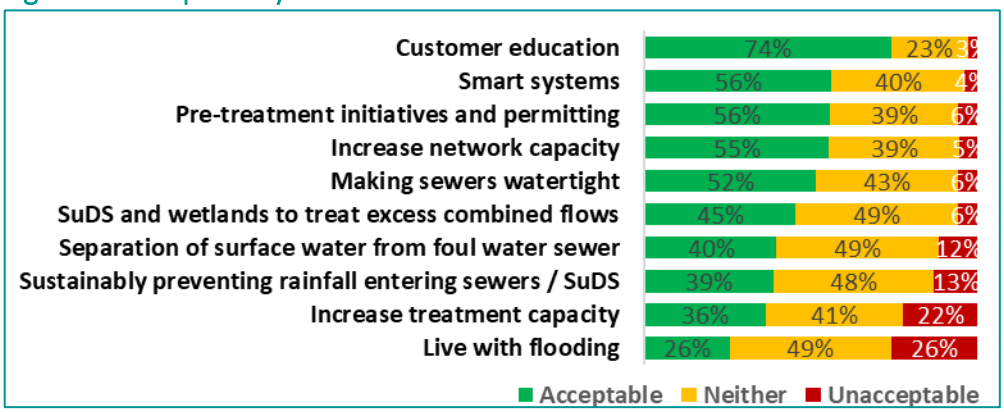
Overall, there are several indications of validity and reliability of the valuations.

- There were very few instances of non-trading behaviour and participants found that choices were easy to understand, and they were able to make comparisons between the options presented to them.
- Our findings were obtained from a sample of Wessex Water customers that had good coverage of all the four drainage regions. Further, the survey data was weighted to be representative of the profile of Wessex Water customer base.
- Results and valuations varied in line with expectations. For example, customers preferred flooding away from their houses, rainwater sewer flooding to foul/combined sewer flooding and less frequent flooding. Further, customers were willing to pay increased amounts for decreased levels of flooding, carbon emissions and local traffic congestion and decreased amounts for increased levels of the same.
- Differences in mean WTP values across most customer segments i.e., region, age, gender and segmentation code were not statistically significant (at 5%) with very few exceptions
- Customers preferred that Wessex Water invests in the period 2025-2030 compared to the status quo situation, all else equal.

Overall, therefore, there are good grounds for considering the valuations to be robust and reliable for use in Wessex Water's Drainage and Wastewater Management Plan.

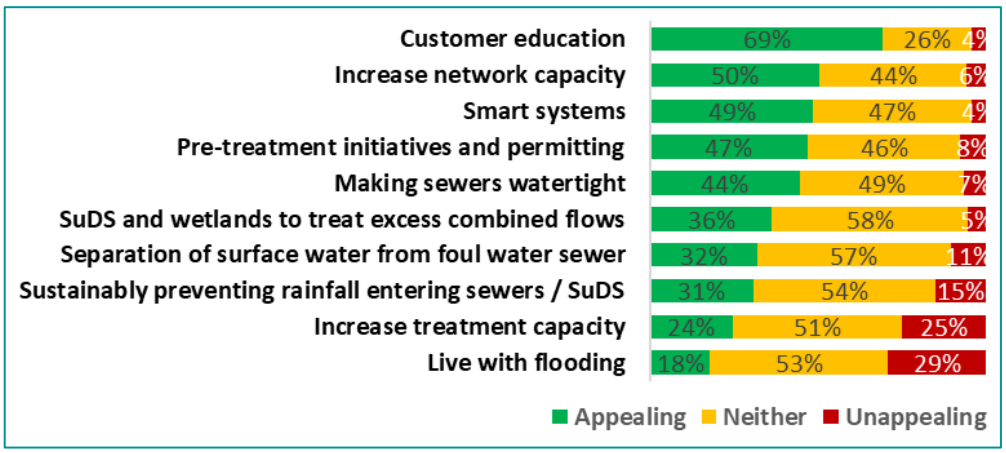
- With regard to the GOs themselves, "Customer Education" was found to be most acceptable and appealing, while "Live with flooding" was least acceptable and least appealing. (See Figure 1 and Figure 2 below.)

Figure 1: Acceptability of GOs



Base: Total=1,084

Figure 2: Appeal of GOs



Base Total=1,084

Generic options were also discussed in the qualitative research. A slightly longer list was explored than was tested quantitatively, but the feedback was largely consistent. A greater depth of insight was obtained from the qualitative research, however, and thus a more insightful evidence base has been achieved overall through the combined research.

1 Introduction

1.1 Context

Accent and PJM Economics were commissioned by Wessex Water to conduct a programme of qualitative and quantitative research to explore customer and stakeholder views and values on issues relating to the company's Drainage and Wastewater Management Plan (DWMP). This research forms part of a wider customer engagement strategy that will underpin the development of Wessex Water's Business Plan for PR24.

1.2 Objectives

The specific objectives of this research included:

- To understand customer views on issues related relating to wastewater drainage
- To understand customer views on the acceptability of impact and frequency of sewer flooding
- To understand the acceptability of and willingness to support a range of potential generic options (GO)
- To understand customer willingness to pay (WTP) for alternative GOs.
- To understand customer views on the impact on bills of alternative options and levels of service
- To understand customer views on when Wessex Water should invest in systems to make them resilient to potential future challenges such as climate change.

In line with these objectives, Accent and PJM Economics developed a multi-stage iterative approach to the study that included the following programme of development and testing:

- Immersive review and Inception meeting to recap and review the results to date from the Strategic Direction Statement (SDS) study.
- Expert co-creation panel from the SDS project to discuss the DWMP, provide feedback on GOs and discuss how to convey them to Wessex Water customers.
- A programme of qualitative discovery to obtain customers' perceptions of wastewater drainage reactions to GOs (especially behavioural focussed). This stage of research involved a wide range of customers including retailers, business and household customers, vulnerable customers and customers who had experienced sewer flooding and wastewater issues.
- A programme of quantitative engagement to design and implement surveys of Wessex Water customers, including a number of stated preference exercises. This stage of research was conducted over two surveys.
- Final refinements by the expert panel to discuss research findings and an Action Planning Workshop to disseminate the results.

This report focuses on findings from the two surveys within the quantitative phase, but also includes a discussion of these in light of the findings from the qualitative research.

1.3 Structure

The remainder of the report is organised as follows.

- Section 2 describes the survey methodology, including the stated preference designs, questionnaire structures and the administration of the surveys.
- Section 3 reports our main findings, including attitudes towards Wessex Water, and findings from analysis of the stated preference exercises.
- Section 4 concludes the study

Appendix A contains the main survey questionnaires for both surveys and Appendix B contains demographic characteristics of the sample data.

2 Methodology

2.1 Introduction

The core research objectives of the quantitative research phase included the following:

- To measure the relative impact of different types of sewer flooding, and willingness to pay for reducing sewer flooding cases (*SP1* and *SP5*)
- To measure customers' preferences and willingness to pay with respect to different outcomes arising from the GOs (*SP2*)
- To measure customers' acceptability of the GOs (*SP3*) and
- To measure customers' preferred timing of investment in sewer flooding service level improvements (*SP6*).

The stated preference study was conducted in two stages with the first stage covering the SP1, SP5 and SP6 choice exercises and the second stage covering the remaining choice exercises. We present the results of the main stages of both the SP surveys in this report.

Section 2.2 describes the stated preference research designs for the SP1 and SP5, SP6, SP2 and SP3 choice exercises; Section 2.3 provides an outline of the survey questionnaires in full; Section 2.4 discusses the main survey administration; Section 2.5 describes the approach to sample weighting.

2.2 Stated Preference Designs

SP1 and SP5: Measuring Level of Service Preferences and Willingness to Pay

Key requirements for the research included the need to measure the relative impacts of different types of sewer flooding and willingness to pay to reduce sewer flooding. The willingness-to-pay measures were needed for incorporation within cost-benefit appraisals of potential improvements to service levels.

Accordingly, the survey included the following two choice exercises:

- SP1 – A pairwise choice experiment examining the relative impact of different types of sewer flooding
- SP5 – A contingent valuation exercise to measure customers' willingness to pay for a package of sewer flooding service level improvements.

Figure 3 shows an example of the type of choice question that was asked under the SP1 stated preference exercise. A sequence of 8 of these questions was asked to each participant, with the composition of Options A and B varying each time.

Figure 3: SP1 Choice format-Illustrative example

Table 3 presents the set of attributes and levels used for the SP1 exercise. All levels could appear in any combination in the options, but the main stage experimental design used results from the pilot survey to ensure that efficient combinations of options were shown.

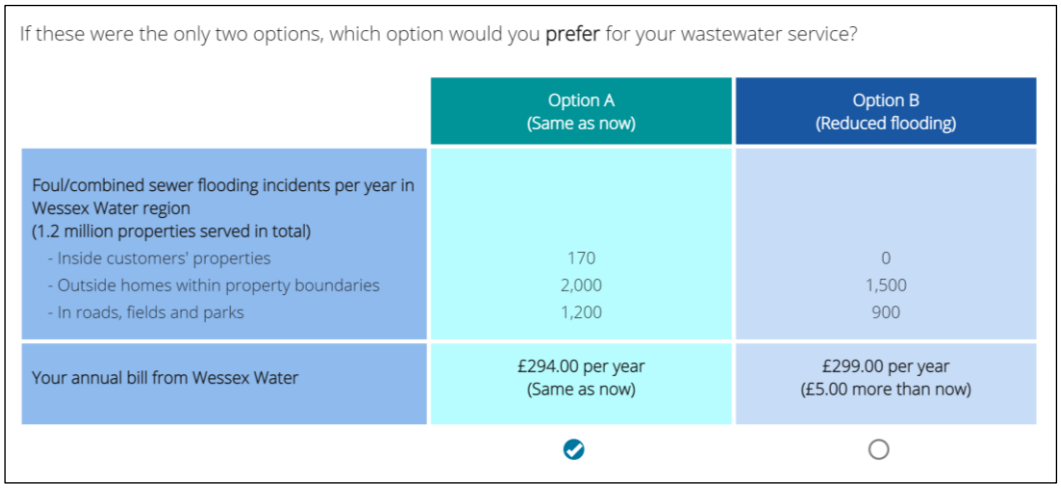
Table 3: SP1 Attributes and levels

Attribute	Levels
Location of sewer flooding	Inside your home Outside your home but within the property boundary: More than 10 square meters affected Outside your home but within the property boundary: Less than 10 square meters affected In your road In your nearest field or park
Type of sewer flooding	Foul/Combined Rainwater only
Frequency of sewer flooding	Twice in 1 year Once in 1 year 1 in 5 years 1 in 10 years 1 in 20 years

SP5 was a choice exercise that focused on valuing a package of service level improvements with respect to the different types of sewer flooding. In this exercise, the levels in Options A and B were fixed except for the bill impact associated with Option B, which was varied across participants so as to measure how the likelihood of choosing Option B depended on cost.

Figure 4 shows an example of the type of choice question that was asked.

Figure 4: SP5 Choice format-Illustrative example



Two questions were asked of each participant in this exercise. The second question involved either doubling or halving the cost depending on whether Option B was chosen at the initial question. This approach is known as the double-bounded dichotomous choice contingent valuation format.

In comparison to open-ended and payment card questions, participants find it easier to understand the format, are much less likely to give protest responses, and have less (no) incentive to misrepresent their preferences (Carson and Groves, 2007)[1]. This format therefore minimises non-responses and avoids outliers. The double-bounded version of the dichotomous choice question provides greater statistical precision than the single question version due to the additional information provided by the follow-up question.

Table 4 shows the cost levels that were used for the SP5 analysis. The cost was multiplied by the household's annual wastewater bill from Wessex Water to convert to a monetary figure in the survey. Our analysis of the SP5 survey data in Section 3 includes an examination of the suitability of these cost levels for the main survey.

Table 4: SP5 Attributes and levels

Attribute	Levels
Cost_Q1	2%; 4%; 8%; 16%; 32%
Cost_Q2	1%; 2%; 4%; 8%; 16%; 32%; 64%

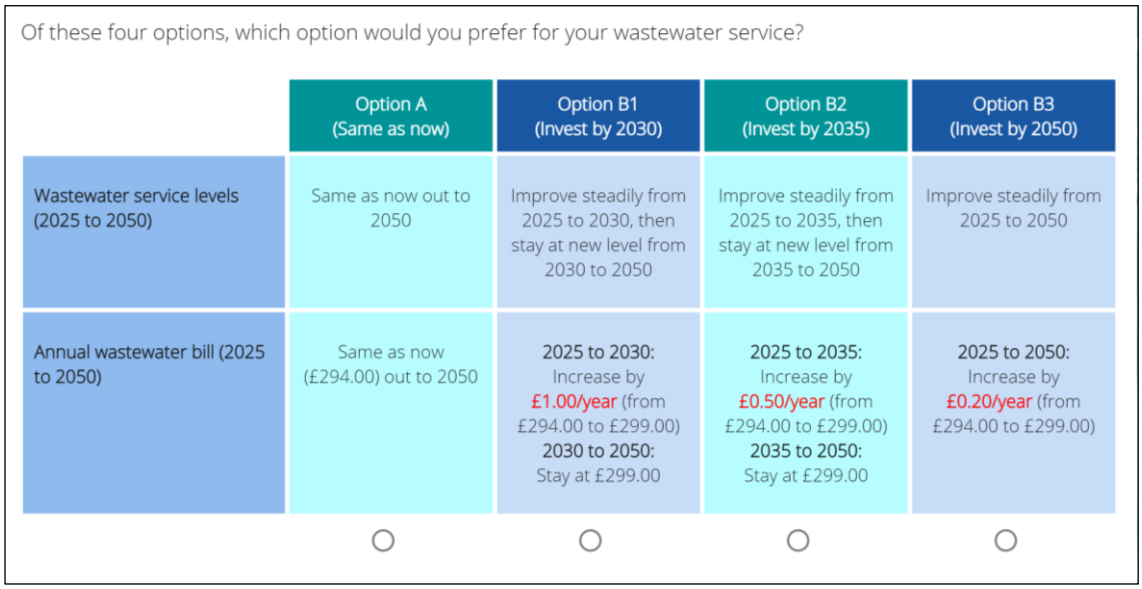
SP6: Measuring Preferred Timing of Investment

A further research objective was to explore customer views on when Wessex Water should invest in systems to make them resilient to potential future challenges such as climate change. To address this, we included a choice exercise to obtain a preference ordering over alternative policies with respect to timing of investment.

[1] Carson, R. and Groves, T. (2007) Incentive and informational properties of preference questions. *Environmental and Resource Economics*, **37**: 181-210.

Figure 5 shows an example of the type of choice question that was asked under the SP6 stated preference exercise.

Figure 5: SP6 Choice format-Illustrative example



In this exercise, only one question was asked per participant, but the water bill impact was varied across the design in line with the initial cost level shown to them in the previous SP5 exercise. This amount determined the ultimate amount the participant was told they would have to pay for the improved level of service. The options then varied according to how quickly service, and bills, would rise, although all questions retained the option not to aim for any improvements at all (Option A).

SP2: Measuring Preferences and Willingness to Pay for DWMP Outcomes

A key requirement for the research was to measure customer preferences and willingness to pay with respect to the different types of options that could be included within the DWMP. The objective was that the results could ultimately be used to inform the appraisal of which options are selected within the DWMP for each area.

Two approaches were agreed: one based on measuring preferences over the impacts arising from the GOs; the other based on testing customer support for the GOs themselves. The advantage of the acceptability-based approach is that it focuses directly and concretely on the options themselves and their pros and cons. The disadvantage, however, is that some options are variable in scale and impact, and these variations cannot be captured well by show material that attempts to characterise options generically.

This deficiency is addressed by the attribute-based exercise, which has the advantage of generating estimates of the trade-offs between different types of impact in such a way as to allow for bespoke economic appraisals considering the costs and the benefits of the options available to choose from in a particular scenario.

Figure 6 shows an example of the type of choice question that was asked under the SP2 stated preference exercise. A sequence of eight of these questions was asked to each participant, with the composition of Options A and B varying each time.

Figure 6: SP2 Choice format-Illustrative example

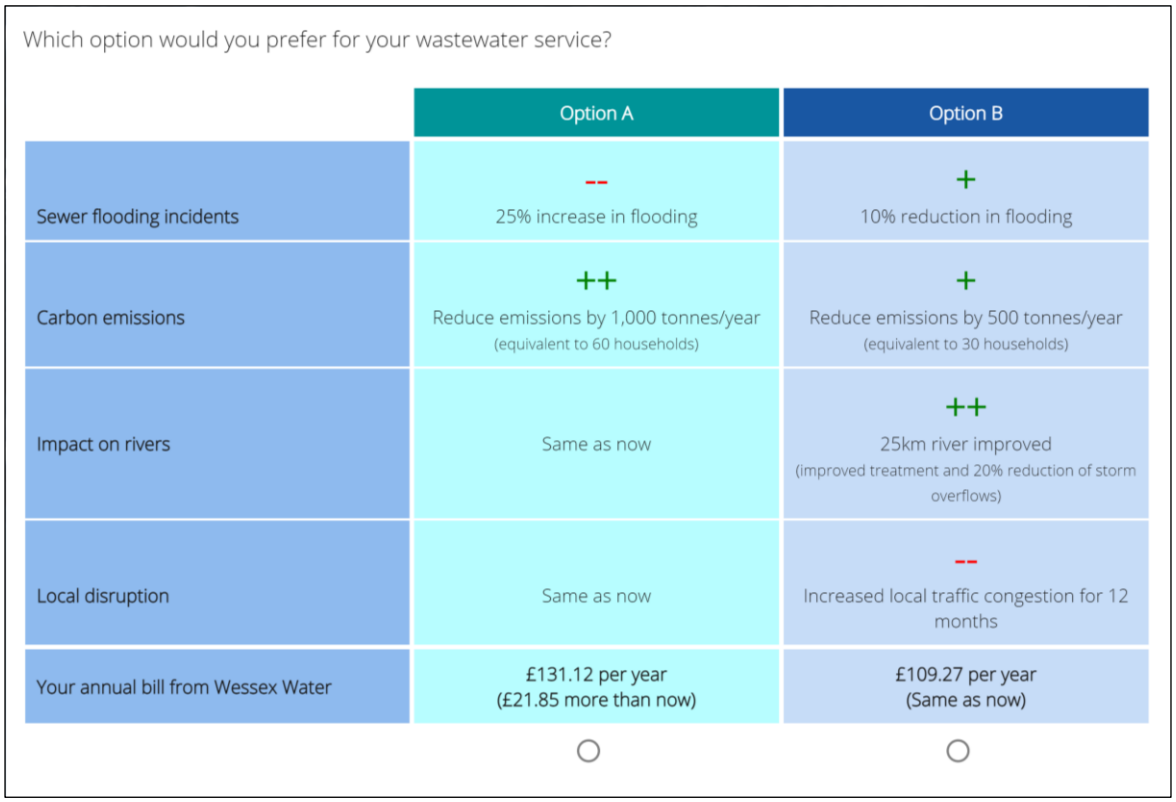


Table 5 presents the set of attributes and levels used for the SP2 exercise, which were agreed with Wessex Water. All attribute levels could appear in any combination in the options, but the main stage experimental design used results from the pilot survey to ensure that efficient combinations of options are shown.

Table 5: SP2 Attributes and levels

Attribute	Levels
Sewer flooding incidents	25% increase in flooding 10% increase in flooding Same as now 10% reduction in flooding 25% reduction in external flooding and preventing flooding houses
Carbon emissions	Increase emissions by 5,000 tonnes/year (equivalent to 300 households) Increase emissions by 1,000 tonnes/year (equivalent to 60 households) Same as now Reduce emissions by 500 tonnes/year (equivalent to 30 households) Reduce emissions by 1,000 tonnes/year (equivalent to 60 households)
Impact on rivers	Same as now 5km river improved slightly [improved treatment] 25km river improved slightly [improved treatment and 25% reduction of storm overflows] 50km river improved slightly [improved treatment and 40% reduction of storm overflows] 100km river improved to fit-for-swimming quality [improved treatment with UV and allowing no more than 3 spills per year from storm overflows]
Local disruption	Increased local traffic congestion for 24 months Increased local traffic congestion for 12 months Increased local traffic congestion for 6 months Same as now
Cost	+40%, +20%, 0%, -5%,-10%

NB: Cost was multiplied by the household's annual bill to convert to a monetary figure in the survey.

SP3: Acceptability and Appeal of Generic Options

A further research objective was to test the acceptability and appeal of the various GOs. The format of the exercise was to show key information about each option, as bullet points, a few options at a time, and then provide a summary of the options with hover buttons for participants to recover the more detailed information about each one if desired.

The survey then asked:

1) if any of the options is unacceptable and, if so, why?
2) if any of the options seem particularly appealing and, if so, why?

The option themes considered for this exercise were provided to us by Wessex Water and included the following:

- Wastewater treatment works:
  - Increase treatment capacity
  - Catchment initiatives and permitting

- Customer side management:
  - Customer education (wet wipe blockages, misuse, lifting covers)
  - Separation - Sustainably preventing rainfall entering sewers / SuDS

- Surface water management :
  - Separation - Traditional surface water sewers
  - SuDS and Wetlands to treat excess combined flows

- Combined and foul sewer systems:
  - Increase network capacity / build underground tanks
  - Live with flooding, but reduce impact of flooding (mitigation)
  - Making sewers watertight to prevent groundwater inundation
  - Smart systems

The results of the SP3 exercise was linked into, and complemented, the more detailed feedback from the qualitative research which covered a similar, although not identical, set of options.

2.3 Questionnaire Structure

The full questionnaire for Survey A was structured as follows:

- Background information of participants
- Questions with respect to participants' experiences with Wessex Water
- Information about Wessex Water and sewer management
- SP1 choice exercises and participant feedback
- SP5 choice exercises and participant feedback
- SP6 choice exercises and participant feedback
- Final classification questions

The full questionnaire for Survey B was structured as follows:

- Background information of participants
- Questions with respect to participants' experiences with Wessex Water
- Information about Wessex Water and sewer management
- SP2 choice exercises and participant feedback
- SP3 choice exercises and
- Final classification questions

2.4 Main Survey Administration

A mixed mode quantitative methodology was followed for both surveys to ensure that we engaged with a range of different customer types. This included:

- Online interviews among Wessex Water domestic customers from Accents panel partners and from sample provided by Wessex Water. Some business customers and customers in vulnerable circumstances were also identified using this approach.

- **Face to face interviews** were conducted to ensure coverage amongst hard to reach, vulnerable and digitally disengaged customers. Interviews were conducted where customers feel most comfortable - in garden or in home.

- **A phone- email- phone** approach to engage with a representative number of business customers.

2.5 Survey Weighting

Weights were created and applied to ensure the results were representative of the Wessex Water customer base. The weights were generated using an iterative proportional fitting, or raking, procedure, which matched weighted sample proportions to target population proportions as follows.

For households:

- Region (Bristol, Somerset, Hampshire & Avon and Dorset)
- Age (18-29, 30-44, 45-64 and 65 plus years)
- Segmentation Code (AB, C1,C2 and DE) and
- Gender (Male and Female).

For non-households:

- Number of employees (Less than 250 and Equal to or more than 250 employees)

The weights were applied throughout our analysis except where otherwise stated, thereby ensuring that the main results are representative of the target populations.

3 Findings

3.1 Introduction

This section presents findings from both surveys. Section 3.2 begins with findings on customers' attitudes towards Wessex Water; Section 3.3 presents the analysis and findings with respect to the impacts on customers of different types of sewer flooding; Section 3.4 contains results on customers' willingness to pay for reduced sewer flooding; Section 3.5 reports results on customer preferences for the timing of investment in reducing sewer flooding; Section 3.6 presents analysis and findings on customers' preferences and willingness to pay for the impacts associated with DWMP options; while Section 3.7 presents findings on the acceptability and appeal of GOs. Section 3.8 completes this section by drawing comparisons against findings of results from the qualitative research.

3.2 Customer Attitudes towards Wessex Water

General perceptions of Wessex Water were assessed via a small number of rating scale questions. As indicated in Figure 13, a mean overall satisfaction score of 7.9/10 (79%) was found. This was slightly lower in the Bournemouth supply area (7.4) compared with Bristol (8.0) and dual supply (7.9).

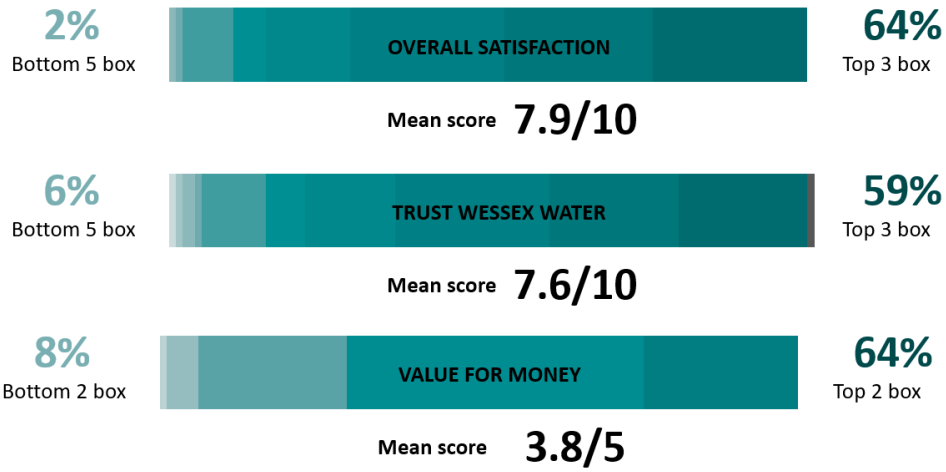
The level of satisfaction is comparable with, but slightly lower than, the overall satisfaction score found in the Strategic Direction Statement (SDS) research conducted for Wessex Water by Accent and PJM Economics earlier in 2021, which identified an overall satisfaction sore of 8.1 out of 10.

There are low levels of dissatisfaction, with just 2% of customers scoring Wessex Water in the bottom 5 boxes for satisfaction (10 point scale).

Overall, Wessex Water continues to achieve a good level of satisfaction in comparison with the UKCSI index[2] which currently sits, as of July 2021, at 77.4% across all industry sectors.

[2] https://www.instituteofcustomerservice.com/research-insight/ukcsi/

Figure 7: Customer perceptions



On average customers recorded a trust rating of 7.6/10, with over half (58%) of participants scoring trust at 7 or higher. The bottom five boxes were marked by just 6% of the participants. This is comparable with the SDS research which saw trust at 7.8/10. Lower trust was identified among future customers (6.8) and, again, by customers in the Bournemouth supply area (7.3).

Customers generally considered Wessex water to be good value for money, with 64% of participants scoring either 4 or 5 out of 5, resulting in an average of 3.8/5. Again, this is comparable with the SDS research, which identified a score of 3.9/5.

3.3 Relative Impacts of Different Types of Sewer Flooding

The first survey examined the relative impact on customers due to different types of sewer flooding through the SP1 exercise. The first part of the following presents diagnostic results which support the cognitive validity of findings from this exercise. The second part then presents the econometric model results, and the remainder then presents and discusses the main results derived from this model.

SP1 Diagnostics

An important first diagnostic in the analysis of choice data is the prevalence of non-trading behaviour. Always choosing the same alternative can be indicative of not engaging with the survey, and a large number of non-traders implies a poor quality dataset for analysis.

As shown in Table 6, only 18 customers of the total of 1,097 customers, chose the same option i.e. Option A or Option B across all the choice occasions in the SP1 choice exercise. This demonstrates that the exercise successfully led to customers trading between the options.

Table 6: SP1 Diagnostics

	Frequency	Percent	Base
Always chose Option A			
Households	10	1.0%	979
Non-households	2	1.7%	118
Always chose Option B			
Households	6	0.6%	979
Non-households	0	0.0%	118
Total	**18**	**1.6%**	**1097**

A second diagnostic derives from participant feedback following the SP1 choice exercise on customers' understanding and ability to make comparisons. Results from these questions, shown in Table 7 below, show that about 90% of the participants agreed that the choices were understandable and easy to compare. This proportion is good for a survey such as this focused on types of service issues that most customers will never have experienced. These results therefore support the validity of the results derived from this exercise.

Table 7: SP1 Participant Feedback

	Frequency	Percent
Did you generally feel able to make comparisons between the options presented to you?		
Yes	986	89.8%
No	111	10.1%
Were any of the options shown hard to understand?		
Yes	103	9.4%
No	994	90.6%
Total	**1,097**	**100%**

SP1 Econometric Model

Participants' choices were analysed via an econometric (mixed logit) model. Mixed logit models allow for variation in preferences over the sample, as well as obtaining estimates of the mean impact of each level change. The specification used omits one level from each attribute, which is then treated as the base case against which other levels are evaluated. These further levels are then modelled with independent normally distributed coefficients.

Location

Omitted: sewer flooding in customers' home

Included:

- *location_out_morethan10:* dummy variable=1 if for sewer flooding outside customers' home but within property boundary with more than 10 square metres affected;=0 otherwise
- *location_out_lessthan10:* dummy variable=1 if for sewer flooding outside customers' home but within property boundary with less than 10 square metres affected;=0 otherwise

- *location_in_road:* dummy variable=1 if for sewer flooding in customers' road;=0 otherwise
- *location_nearestpark:* dummy variable=1 if for sewer flooding in customers' nearest field or park;=0 otherwise

Type

Omitted: foul/combined flooding

Included:

- *type_rainwater:* dummy variable=1 if there is rainwater flooding; =0 otherwise

Frequency

Omitted: flooding twice in one year

Included:

- *freq_onceyear*: dummy variable=1 if frequency of flooding is once a year;=0 otherwise
- *freq_one_in_5years:* dummy variable=1 if frequency of flooding is once in 5 years;=0 otherwise
- *freq_one_in_10years:* dummy variable=1 if frequency of flooding is once in 10 years;=0 otherwise
- *freq_one_in_20years:* dummy variable=1 if frequency of flooding is once in 20 years;=0 otherwise

Table 8 shows the results of the estimated model.

Table 8: SP1 Econometric Model Results

Choice	Coef.	Std.Err	Z	p	Lower	Upper
Mean						
Location of flooding						
location_internal (=base)	[omitted]					
location_out_morethan10	-1.940	0.102	-19.05	0	-2.140	-1.741
location_out_lessthan10	-2.090	0.107	-19.5	0	-2.301	-1.880
location_in_road	-2.749	0.133	-20.61	0	-3.010	-2.487
location_nearestpark	-3.630	0.179	-20.3	0	-3.980	-3.279
Type of flooding						
type_foul (=base)	[omitted]					
type_rainwater	-1.827	0.093	-19.56	0	-2.010	-1.644
Frequency of flooding						
freq_twiceyear (=base)	[omitted]					
freq_onceyear	-0.164	0.062	-2.62	0.009	-0.286	-0.041
freq_one_in_5years	-0.835	0.068	-12.32	0	-0.968	-0.702
freq_one_in_10years	-1.417	0.080	-17.82	0	-1.573	-1.261
freq_one_in_20years	-2.173	0.103	-21.07	0	-2.375	-1.971
Std deviation						
location_out_morethan10	0.086	0.327	0.26	0.792	-0.555	0.727
location_out_lessthan10	0.200	0.182	1.1	0.272	-0.156	0.556
location_in_road	0.398	0.158	2.52	0.012	0.089	0.707
location_nearestpark	1.233	0.094	13.16	0	1.049	1.417
type_rainwater	1.212	0.059	20.37	0	1.095	1.328
freq_onceyear	0.420	0.135	3.12	0.002	0.156	0.684
freq_one_in_5years	-0.231	0.174	-1.33	0.184	-0.572	0.110
freq_one_in_10years	-0.120	0.108	-1.12	0.264	-0.332	0.091
freq_one_in_20years	-1.010	0.093	-10.87	0	-1.193	-0.828
No of observations	17,552(1097*8*2)					
No of participants	1,097					
Pseudo R^2	0.12					

Overall, the findings from the econometric analysis are positive. The signs and relative magnitudes of coefficients are all in line with expectation and the levels of precision are also good, with all coefficients reaching statistical significance at the 5% level.

We use the results of the SP1 choice exercise to obtain an index of relative impact for different types of flooding. Specifically, the SP1 model coefficients are used to derive impact scores for all the levels of location, type and frequency of flooding. The impact scores are calculated as odds ratios (exponentiated coefficients) that are then scaled to sum to 100 to indicate the relative magnitude of the differences across flooding levels.

Figure 8, Figure 9, Figure 10 show the relative impacts associated with levels of location, frequency and type of flooding. These results show the following:

- The impact of sewer flooding was worst when inside the home. Next worst was when flooding was outside the customers' home but within the property boundary, with more than 10 square metres affected followed by when less than 10 square metres were affected. The next worst location was the customers' road, and the least impactful location was in the nearest field or park. This order of impact is as expected.

- The impact of rainwater sewer flooding was lower than the impact of foul/combined sewer flooding, again as expected.

- The impact of sewer flooding was worst when occurring twice in one year. Next worst was sewer flooding occurring once a year followed by when occurring once in 5 years. The next worst frequency of flooding was when occurring once in 10 years and the least impactful was when occurring once in 20 years. This order of impact is again as expected.

Figure 8: Relative impacts of flooding by location

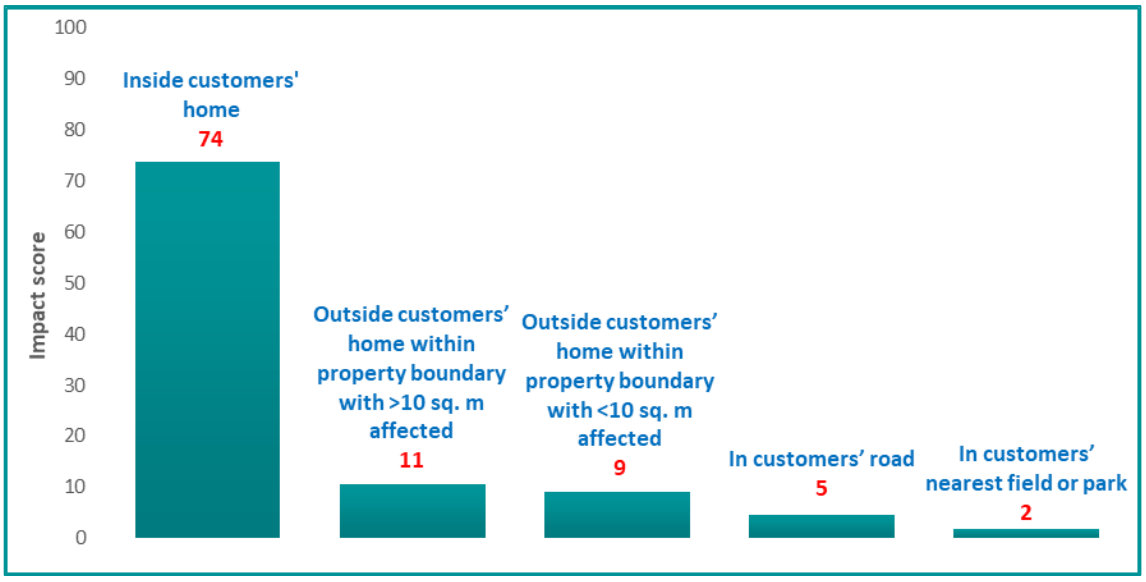


Figure 9: Relative impacts of flooding by frequency

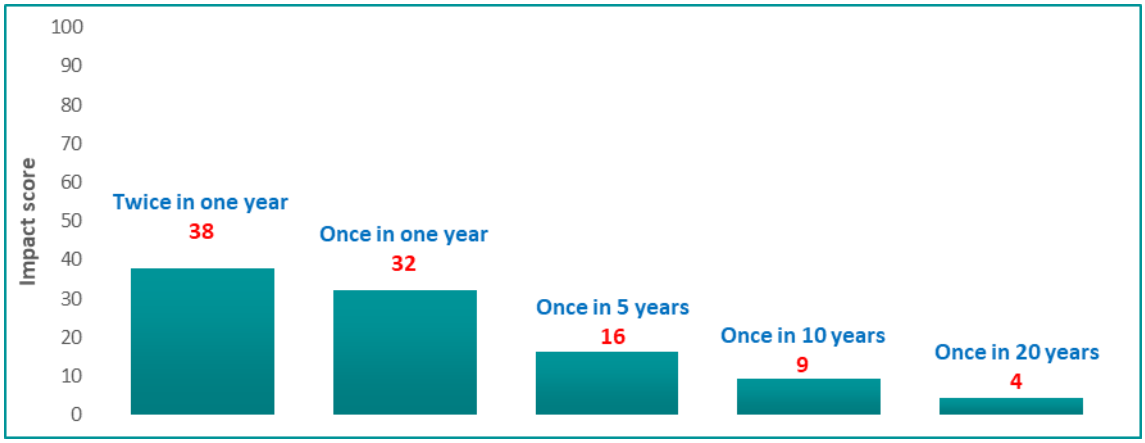
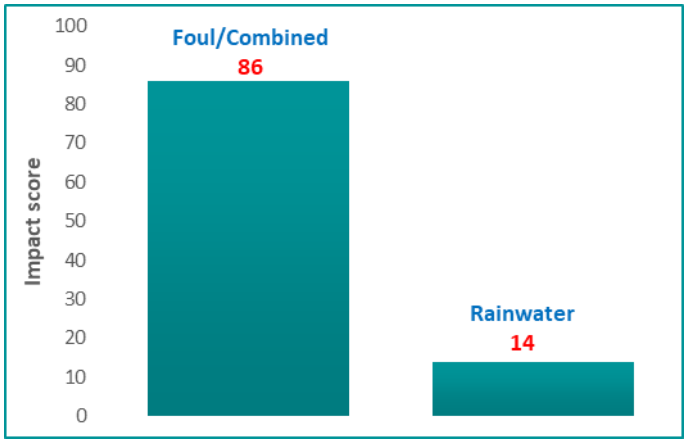


Figure 10: Relative impacts of flooding by type (Rainwater or Foul/Combined)



In order to generate value estimates for the types of sewer flooding, the SP1 coefficients were transformed and scaled using results obtained from analysis of the SP5 exercise, which is the subject of Section 3.4.

3.4 Willingness to Pay for Reduced Sewer Flooding

In the SP5 choice exercise, participants were asked two questions: the first question involved a choice between Option A (status quo) and Option B (reduced flooding at a cost) and the second question involved either doubling or halving the cost depending on whether Option B was chosen at the initial question.

Participant Feedback

Participants were asked the reason for their choice following the first SP5 question. The feedback from some of the participants is shown in the table below:

Table 9: SP5 Participant Feedback-Reasons for Choosing Option A or B

Why choose this option?
Those choosing Option B– Reduced flooding
£10 per year is very little per month to pay for having no incidents of flooding indoors.

Better for more people
Clearly is much less damaging for very little extra cost
Compared to the already high charges, another £5 makes little difference
For the reduction of flooding
Foul water should be prevented from entering properties
I am concerned about the cost but also worried about flooding.
I felt I had no choice but to pay more for people's homes not to be flooded - although this would possibly cause debt
I have been flooded in my previous property and realise the distress it can cause
I think i like this option so i select this
It is worth paying for reduced flooding risk
It makes sense
It seemed the best one.
It seemed to be the most sensible
It was more community orientated.
less chance of flooding
Less flooding chance inside home
Minimal increase for added protection from sewer flooding
No indoor flooding
No one wants their homes flooded and the extra cost to avoid this is minimal
Nobody would want flooding in their home and if it will cost only £5 extra i would pay that.
Not a lot to pay for a lot less instances of water ingress
Paying £10.00 more with a 25 pct reduction of risk of flooding has got to be worth it
Seemed like a good choice
Sewage in flooding must be a risk to health. Plus the smell etc. affects houses even if it does not enter the house. Rainwater flooding is not desirable but not as bad as the above
Small price to pay for the chance of less flooding
The most logical to me
There is clearly a risk to health with any foul water flooding so this should be reduced
To protect everyone and our neighbourhoods
Those choosing Option A – Same as now
A lot more money which most people would find unaffordable for the reduced risk of flooding in people's homes
Basically, just down to cost as it would be around £12 more a month and money very tight for me
Because I do not want to put more money into a private company paying share holders
Bills today are expensive enough without having increases
Cost
Current property is unlikely to be affected
I don't see that I should pay when building on flood plains and idiots blocking sewers are major causes
I'm not willing to pay more as money is very limited
It's far too big an increase to pay
It's the cheaper option
It's because we had sewage leaking from a pipe 500 metres from my property which many people use. It's been going on for years.
It's cheaper
Should not need to pay more for what would be expected in a developed country
The bill is high enough as it is.
The differing amounts were not that far apart to warrant paying more
The same amount of money

We don't experience and are unlikely to experience flooding of any kind

This participant feedback indicates consistency between choices and reasons for those choices in the vast majority of cases. This supports the validity of the results that are derived from these responses as it shows that the responses can be considered meaningful and valid.

Econometric Model

Dichotomous choice contingent valuation responses do not directly record participants' willingness to pay. Instead, they determine whether the participant is willing to pay at least the cost amount shown. It is therefore necessary to impose an assumption concerning the shape of the WTP distribution to estimate mean WTP. The choice frequencies at each cost amount are then used to fit the parameters of this distribution.

The two estimators most commonly used in the contingent valuation literature (see e.g. Johnston et al 2017)[3] are the Turnbull non-parametric estimator and the logit model. The Turnbull method estimates the lowest value of mean WTP that is consistent with the choice data, hence guaranteeing that the estimate of mean WTP is not inflated by the choice of distribution assumed. The logit model, by contrast, attempts to fit a reasonable shape to the WTP distribution – typically either logistic or log-logistic.

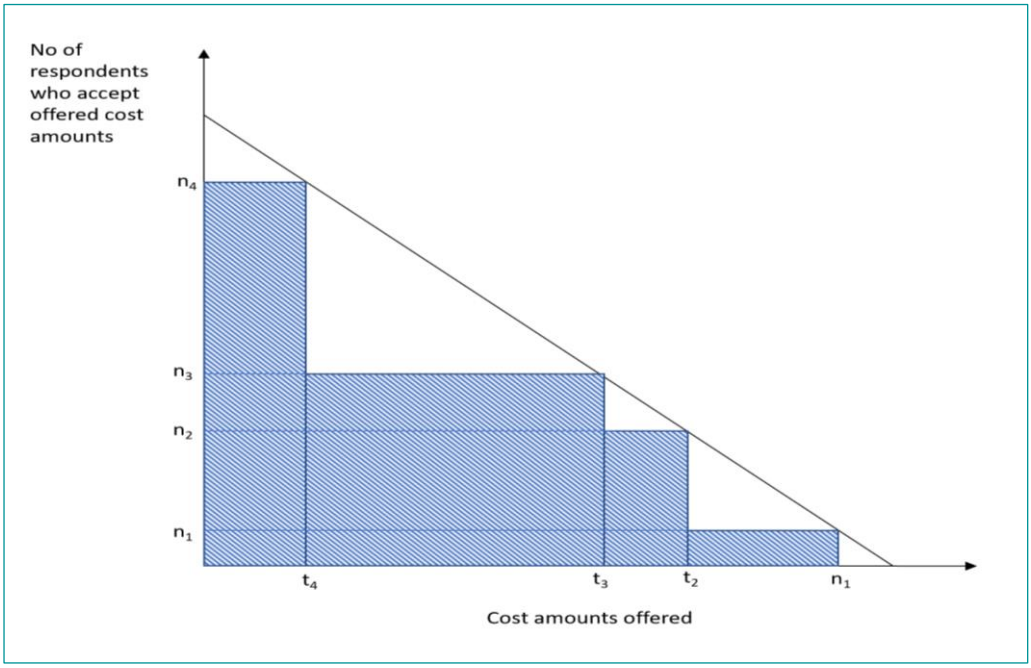
Following best practice guidelines for contingent valuation studies, we adopt the Turnbull method to take forward in the remainder of our analysis as this value provides the conservative lower estimate. The Turnbull method[4] calculates the lower bound of mean WTP that is consistent with the choices made by participants. The approach is illustrated in Figure 11 below, which shows a hypothetical demand curve for an improvement package. In the figure, the cost of the improvement is on the horizontal axis and the proportion willing to pay that cost amount is shown on the vertical axis. Observed data points are represented by the points $\{(t_1,n_1), (t_2,n_2),..,(t_5,n_5)\}$ and mean WTP is equal to the area under the demand curve.

The Turnbull method calculates the lower bound of mean WTP by summing the shaded area represented by the rectangles under the demand curve. This area will, in general, be smaller than the area under the true, unknown, demand curve, which is the true WTP.

[3] Johnston et al (2017) Contemporary Guidance for Stated Preference Studies, Journal of the Association of Environmental and Resource Economists, 4(2), 319-405.

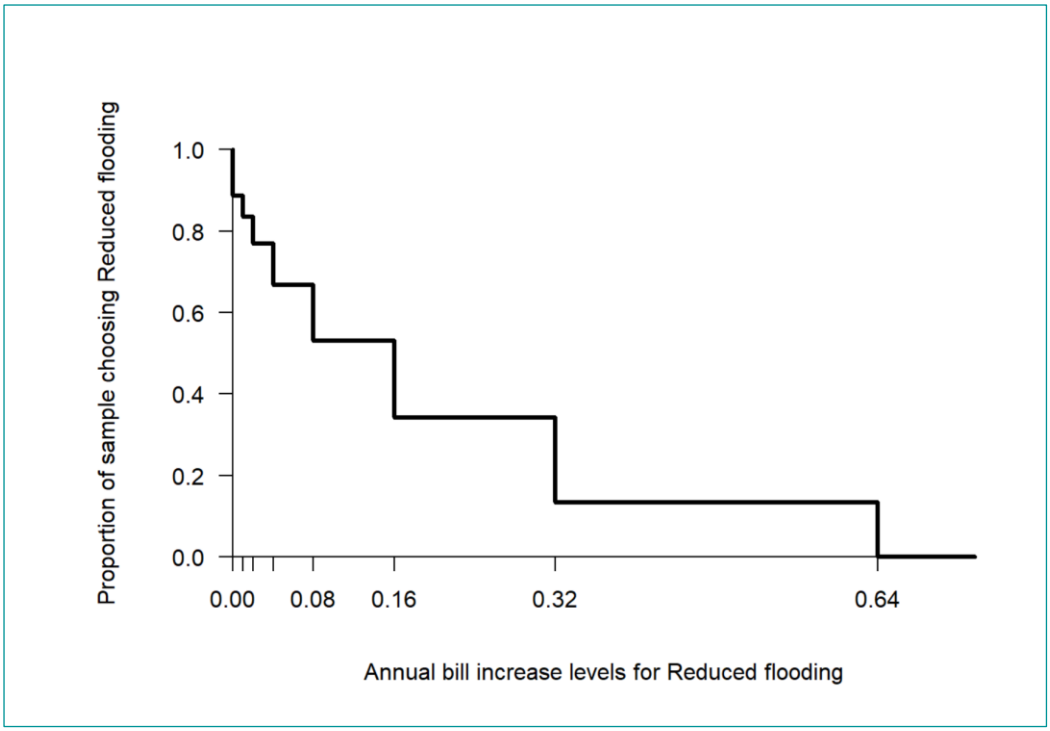
[4] See Haab, T. and McConnell, K. (2002) Valuing Environmental and Natural Resources: The Econometrics of Non-Market Valuation. Edward Elgar. Cheltenham, UK.

Figure 11: Illustration of Turnbull estimator



The Turnbull estimation was implemented in R using the "*DCchoice*" package[5]. The results of the analysis are presented in Figure 12 below.

Figure 12: Proportion of sample choosing reduced flooding vs Cost of reduced flooding



As expected, the curve is downward sloping, indicating that participants were more likely to choose Reduced flooding when cheaper than when more expensive. The curve also

[5]Nakatani T, Aizaki H, Sato K (2021). *DCchoice: An R Package for Analysing Dichotomous Choice Contingent Valuation Data*. R package version 0.1.0.

spans almost the full range with around 10% choosing Reduced flooding at the highest cost levels i.e. (32% 64%]. This verifies that the range of cost changes was appropriate.

The Turnbull estimate of lower bound mean WTP for reduced flooding was calculated as 19% of the annual wastewater bill per year. The Turnbull estimator is asymptotically normally distributed due to the Central Limit Theorem. The 95% bootstrapped confidence intervals around the mean is calculated as [17.9%, 21.7%].

Based on the average household annual wastewater bill of £223, this implies a mean WTP for Reduced flooding of £42.37 per year. Further, the confidence interval estimates imply that 95% of samples of the same kind from the same population would be expected to result in a mean WTP for reduced flooding between £39.91 and £48.39.

SP1 and SP5 Combined: WTP for Different Types of Sewer Flooding

Values can be validly obtained for avoidance of different types of sewer flooding by combining the mean value for the package of reduced sewer flooding obtained from the SP5 exercise with the relative impacts of different types of sewer flooding incident derived from the SP1 choice exercise.

Overall, we combine the SP1 and SP5 choice exercise results as follows:

- The SP1 model results were used to obtain individual-level coefficients for the different levels of location, type and frequency of flooding.
- Individual-level coefficients were then combined with the mean value for the package of service improvements (SP5) to derive individual-level WTP values for the different levels of location, type and frequency of flooding.
- Finally, the individual-level WTP values were combined with Wessex Water total connected properties to derive total scaled WTP values for each type of avoided sewer flooding incident.

To demonstrate how we calculate the scaled WTP values, let the following define the relevant terms

WTP_k	mean value per avoided service failure of type k, our target measure
N	the number of Wessex Water customers
WTP_P	estimated mean value for package P, derived from the Package exercise analysis
U_{ik}	the impact score estimate for service failure k and participant i, derived from the SP1 analysis.
P_k	the change in number of service failures of type k embedded within package P
U_{iP}	the unscaled sum of utilities for package P and participant i , derived as $U_{iP} = \sum_k U_{ik} P_k$

Then, we have the following formula to derive our main estimates of WTP_k:

$$WTP_k = N\ WTP_P\ U_{ik} / U_{iP}$$

This formula states that the value of an avoided service failure of type *k* is calculated by first multiplying the total number of Wessex Water customers by the WTP value to obtain the total WTP value for the package i.e. ($N \cdot WTP_P$). This is multiplied by the impact score of service failure k for each participant *i*, which itself is derived as the odds ratio associated with service failure k and participant *i* (U_{ik}) divided by the unscaled estimate of total utility for the package for each participant *i* ($\sum_k U_{ik} P_k$).

The ultimate results represent the total customer valuation for the entire customer base for avoiding one unit of each specific type of service failure.

The WTP results obtained through combining SP1 and SP5 results are presented in the following table.

Table 10: WTP values per avoided sewer flooding incident, per property affected

Options	WTP (£/year/avoided foul/combined sewer flooding incident)	WTP (£/year/avoided rainwater only sewer flooding incident)
Inside customers' home	£227,378	£36,608
Outside customers' home within property boundary with >10 sq. m affected	£32,663	£5,259
Outside customers' home within property boundary with <10 sq. m affected	£28,093	£4,523
In customers' road	£14,635	£2,356
In customers' nearest field or park	£7,971	£1,283

NB: Values for external flooding should be multiplied by the number of properties affected by each type of incident.

The results show that mean customer WTP was around £227,000 per avoided combined/foul sewer flooding incident inside the home; around £32,000 per avoided combined/foul sewer flooding incident outside the home within property boundary with greater than 10 square metres affected; £28,000 per avoided combined/foul sewer flooding incident outside the home within property boundary with less than 10 square metres affected; around £14,000 per avoided combined/foul sewer flooding incident in the customer's road and around £7,900 per avoided combined/foul sewer flooding incident in the customer's nearest field or park.

Further, the results show that on average, customer WTP was around £36,000 per avoided rainwater only sewer flooding incident inside the home; around £5,000 per avoided rainwater only sewer flooding incident outside the home within property boundary with greater than 10 square metres affected; £4,000 per avoided rainwater only sewer flooding incident outside the home within property boundary with less than 10 square metres affected; around £2,000 per avoided rainwater only sewer flooding incident in the customer's road and around £1,280 per avoided rainwater only sewer flooding incident in the customer's nearest field or park.

These results appear somewhat high, which could be driven by the fact that the change in the number of sewer flooding incidents associated with the package is small, and yet package valuations are fairly high, at £42.37 per household per year.

For our segmentation analysis, we use the individual-level estimated WTP values for the two types of sewer flooding and assess the statistical significance in differences of mean WTP values between different customer segments via multiple t-tests.

The segments considered for our analysis are as follows:

- Region (Bristol, Somerset, Hampshire & Avon and Dorset)
- Age (18-29, 30-44, 45-64 and 65 plus years)
- Segmentation Code (AB, C1,C2 and DE) and
- Gender (Male and Female).

Overall, differences in mean WTP values between most segments were not statistically significant (at 5%) with some exceptions shown in the table below.

Table 11: SP1-Statistically significant differences in WTP across customer segments

	Types of Flooding	WTP (£/year/avoided foul/combined sewer flooding incident)	
REGION	Outside customers' home within property boundary with <10 sqm affected	Somerset: £28,436	Hampshire & Avon: £27,983
	In customers' nearest field or park	Somerset: £6,604	Hampshire & Avon: £8,361
AGE	In customers' road	Age 30-44 years: £14,334	Age 65 plus years: £14,907
		WTP (£/year/avoided rainwater sewer flooding incident)	
REGION	Outside customers' home within property boundary with <10 sqm affected	Somerset: £4,578	Hampshire & Avon: £4,505
	In customers' nearest field or park	Somerset: £1,063	Hampshire & Avon: £1,346
AGE	In customers' road	Age 30-44 years: £2,307	Age 65 plus years: £2,400

3.5 When Wessex Water Should Invest

The objective of the SP6 choice exercise was to explore customer views on when Wessex Water should invest in systems to make them resilient to potential future challenges such as climate change. For this we included a simple choice exercise (see Figure 5) to obtain a preference ordering over alternative policies with respect to timing of investment.

Table 12 below shows the frequency of options chosen in the SP6 choice exercise. The results show that the most popular option was to invest entirely within the first 5-year period, with 43% of the participants choosing Option B1, 21% choosing Option A, 20% choosing Option B3 and 15% choosing Option B2.

Table 12: SP6: Tabulation of options chosen

Options	Frequency	Percent
Option A: Same as now	232	21.1%
Option B1: Invest by 2030	478	43.6%
Option B2: Invest by 2035	167	15.2%
Option B3: Invest by 2050	220	20.1%
Total	**1097**	**100%**

In order to control for the potential influence of cost on the preferred timing of investment, we analyse participants' choices via an econometric (conditional logit) model that includes the following explanatory variables:

- *sp6bill*: Bill increases per year from 2025 to 2030, to 2035 and to 2050
- *Option B1, Option B2 and Option B3*: alternative-specific constants (dummy variables) for the "Invest in 2030", "Invest in 2035" and "Invest in 2050" options respectively

Table 13 shows the results of the estimated econometric model.

Table 13: SP6 Econometric model results

Choice	Coef.	Std.Err	Z	p	Lower	Upper
sp6bill	-0.0001	0.0001	-0.69	0.493	-0.0003	0.0001
Option A (=base)	[omitted]					
Option B1	0.7441	0.0879	8.46	0.00	0.5718	0.9165
Option B2	-0.2016	0.1052	-1.92	0.055	-0.4078	0.0045
Option B3	-0.0555	0.1017	-0.55	0.585	-0.2548	0.1439
Number of obs.	4388(1097*4)					
No. participants	1097					
Pseudo R^2	0.06					

The results show the following:

- As expected, the coefficient for the bill increase variable is negative which indicates that overall people prefer less costly options, all else equal.
- The positive coefficient for the Option B1 variable indicates that overall people prefer that Wessex Water invests in the period 2025-2030 compared to the status quo situation (i.e. Option A), all else equal.
- The negative coefficients for Options B2 and B3 indicate that overall people prefer the status quo situation compared to Wessex Water investing in the periods 2025-2035 and 2025-2050.
- The coefficients for the variables in the model (except for Option B1) are however not statistically significant.

The results are in line with the descriptive findings from Table 12 showing that, across all the bill increase levels, people prefer Option B1 to Option A which is preferred to Option B3 and which in turn is preferred to Option B2. This indicates that customers prefer investment to take place in the 2025-2030 period rather than being spread over a longer period.

3.6 Preferences and Willingness to Pay for DWMP Outcomes

SP2 Diagnostics

An important first diagnostic in the analysis of choice data is the prevalence of non-trading behaviour. Always choosing the same alternative can be indicative of not engaging with the survey, and a large number of non-traders implies a poor quality dataset for analysis.

As shown in Table 14, only 4% customers chose the same option i.e. Option A or Option B across all the choice occasions in the SP2 choice exercise, which is a positive result.

Table 14: SP2 Diagnostics

	Frequency	Percent	Base
Always chose Option A			
Households	21	2.3%	923
Non-households	8	4.9%	161
Always chose Option B			
Households	14	1.5%	923
Non-households	2	1.2%	161
Total	**45**	**4%**	**1,084**

The feedback on the SP2 choice exercise is shown in These statistics indicate that a substantial minority of participants found the exercise difficult. This is reflective of the fact that the outcomes shown were somewhat outside of people's usual daily experience.

Table 15 below. The table shows that about 85% participants agreed that the choices were easy to compare while 82% participants found the choices easy to understand. These statistics indicate that a substantial minority of participants found the exercise difficult. This is reflective of the fact that the outcomes shown were somewhat outside of people's usual daily experience.

Table 15: SP2 Participant Feedback

	Frequency	Percent
Did you generally feel able to make comparisons between the options presented to you?		
Yes	924	85%
No	160	15%
Were any of the options shown hard to understand?		
Yes	192	18%
No	892	82%
Total	**1,084**	**100%**

SP2 Econometric Model

We analyse participants' choices via an econometric (mixed logit) model. Mixed logit models describe the variation in preferences over the sample, as well as obtaining estimates of the average impact for each level change.

The specification that we used linearises the bill impact attribute and leaves one level out from each of the remaining attributes, which is then treated as the base case against which other levels are evaluated. The coefficient of the bill impact variable is treated as fixed while the levels for all the remaining attributes are modelled with independent normally distributed coefficients, which ensures that the WTP distribution has finite moments.

Bill percentage changes

- *billpchange_cont* = 0.40 when bill increases by +40%
- *billpchange_cont* = 0.20 when bill increases by +20%
- *billpchange_cont* = 0.00 when bill stays the same as now
- *billpchange_cont* =-0.05 when bill decreases by 5% and
- *billpchange_cont* =-0.10 when bill decreases by 10%

Flooding

Omitted: Flooding stays the same as now (base level).

Included:

- *flooding_plus25*: dummy variable=1 if Flooding increases by 25%; =0 otherwise.
- *flooding_plus10:* dummy variable=1 if Flooding increases by 10%; =0 otherwise.
- *flooding_minus10:* dummy variable=1 if Flooding decreases by 10%; =0 otherwise.
- *flooding_minus25:* dummy variable=1 if Flooding decreases by 25%; =0 otherwise.

Carbon Emissions

Omitted: Emissions stay the same as now (base level).

Included:

- *carbon_plus5000*: dummy variable=1 if Emissions increase by 5,000 tonnes/year (eq to 300 households);=0 otherwise.
- *carbon_plus1000:* dummy variable=1 if Emissions increase by 1,000 tonnes/year (eq to 60 households);=0 otherwise.
- *carbon_minus500:* dummy variable=1 if Emissions decrease by 500 tonnes/year (eq to 30 households);=0 otherwise.
- *carbon_minus1000:* dummy variable=1 if Emissions decrease by 100 tonnes/year (eq to 60 households);=0 otherwise.

River Improvement

Omitted: Impact is same as now (base level).

Included:

- *rivers_plus5*: dummy variable=1 if 5km river improved slightly [improved treatment]; =0 otherwise.
- *rivers_plus25* : dummy variable=1 if 25km river improved slightly [improved treatment and 25% reduction of storm overflows]; =0 otherwise.

- *rivers_plus50* : dummy variable=1 if 50km river improved slightly [improved treatment and 40% reduction of storm overflows]; =0 otherwise.
- *rivers_plus100* : dummy variable=1 if 100km river improved to fit-for-swimming quality ;=0 otherwise

Local Disruption

Omitted: Local disruption stays the same (base level).

Included:

- *disruption_plus24*: dummy variable=1 if Increased local traffic congestion for 24 months; =0 otherwise.
- *disruption_plus12:* dummy variable=1 if Increased local traffic congestion for 12 months; =0 otherwise.
- *disruption_plus6*: dummy variable=1 if Increased local traffic congestion for 6 months; =0 otherwise.

Table 16 shows the results of the estimated mixed logit model. The results show the following:

- The coefficient of bill percentage change is negative and significant which shows, as expected, that participants prefer less costly options, all else equal.

- The coefficients of increased sewer flooding incidents is negative and significant and the coefficients of decreased sewer flooding incidents is positive and significant which shows that participants prefer fewer flooding incidents, all else equal.

- The coefficients of increased carbon emissions is negative and significant and the coefficients of decreased carbon emissions is positive and significant which shows that participants prefer less carbon emissions, all else equal.

- The coefficients on river improvements are all positive and significant which shows that participants prefer an improved treatment of rivers, all else equal.

- The coefficients on increased disruption are negative and significant and the coefficients on decreased disruption are positive and significant which shows that participants prefer less local traffic congestion.

- There is significant heterogeneity in customers' preferences with respect to, flooding and carbon emissions, as indicated by the size and significance of the standard deviation coefficients.

Overall, the signs of coefficients are all in line with expectation. The levels of precision are also good with all the coefficients reaching statistical significance at the 5% level. The model therefore serves as a good basis for deriving WTP estimates.

Table 16: SP2 Econometric Model Results

	Coef.	Std.Err	Z	p	Lower	Upper
Mean						
billpchange_cont	-4.685	0.270	-17.36	0	-5.213	-4.156
Flooding						
flooding_same(=base)	[omitted]					
flooding_plus25	-0.868	0.088	-9.82	0	-1.041	-0.694
flooding_plus10	-0.523	0.063	-8.33	0	-0.646	-0.400
flooding_minus10	0.329	0.063	5.18	0	0.204	0.453
flooding_minus25	0.762	0.080	9.57	0	0.606	0.918
Carbon Emissions						
carbon_same(=base)	[omitted]					
carbon_plus5000	-0.897	0.095	-9.47	0	-1.083	-0.712
carbon_plus1000	-0.270	0.059	-4.61	0	-0.385	-0.155
carbon_minus500	0.383	0.059	6.45	0	0.266	0.499
carbon_minus1000	0.680	0.063	10.87	0	0.557	0.803
River Improvement						
rivers_same(=base)	[omitted]					
rivers_plus5	0.200	0.058	3.45	0.001	0.086	0.313
rivers_plus25	0.478	0.060	7.97	0	0.360	0.595
rivers_plus50	0.817	0.069	11.81	0	0.682	0.953
rivers_plus100	1.014	0.082	12.36	0	0.853	1.175
Local Disruption						
disruption_same(=base)	[omitted]					
disruption_plus24	-0.541	0.069	-7.86	0	-0.676	-0.406
disruption_plus12	-0.272	0.060	-4.54	0	-0.389	-0.154
disruption_plus6	-0.139	0.050	-2.78	0.005	-0.237	-0.041
Std deviation						
flooding_plus25	1.419	0.098	14.46	0	1.226	1.611
flooding_plus10	-0.254	0.177	-1.44	0.151	-0.601	0.093
flooding_minus10	0.210	0.125	1.68	0.093	-0.035	0.454
flooding_minus25	0.620	0.107	5.81	0	0.411	0.829
carbon_plus5000	1.287	0.103	12.53	0	1.086	1.489
carbon_plus1000	0.261	0.129	2.02	0.044	0.007	0.515
carbon_minus500	0.387	0.108	3.59	0	0.176	0.598
carbon_minus1000	-0.534	0.100	-5.33	0	-0.731	-0.338
rivers_plus5	-0.160	0.131	-1.23	0.22	-0.416	0.096
rivers_plus25	-0.330	0.112	-2.95	0.003	-0.549	-0.111
rivers_plus50	-0.330	0.110	-3.02	0.003	-0.545	-0.116
rivers_plus100	-0.447	0.096	-4.67	0	-0.635	-0.259
disruption_plus24	0.328	0.113	2.9	0.004	0.106	0.549
disruption_plus12	0.651	0.089	7.31	0	0.477	0.825
disruption_plus6	0.117	0.113	1.04	0.299	-0.104	0.338
No of obs	17344(1084*8*2)					
No of participants	1084					
Pseudo R^2	0.12					

We use the SP2 model results to obtain individual-level coefficients for the various GOs. The individual-level coefficients are then used to derive individual-level WTP values for the GOs (in terms of % bill change) by dividing them through by the fixed bill percentage change coefficient. The WTP values in terms of % bill changes are translated to £/year values by multiplying the former values by the average annual household wastewater bill of £223.

The following figures present the WTP values for the GOs, both in terms of % bill changes as well as £/year for an average household.

For example, Figure 13 shows that for a 10% *decrease* in flooding, customers were, on average, willing to pay a 7% increase in their annual wastewater bill. This amounts to a WTP of £15.61 per year at the average annual household wastewater bill of £223. On the other hand, for a 10% *increase* in flooding, customers required a 11% compensatory decrease in their annual wastewater bill. This amounts to a mean value of £24.98 per year at the average annual household wastewater bill. The remaining figures can be interpreted in a similar manner.

Figure 13: Value of flooding impacts (% bill change)

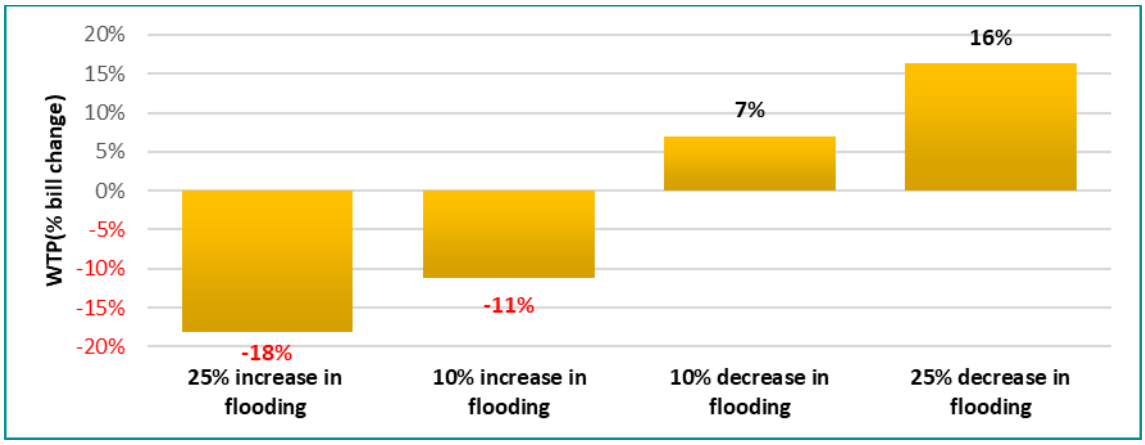


Figure 14: Value of flooding impacts (£/year for an average household)

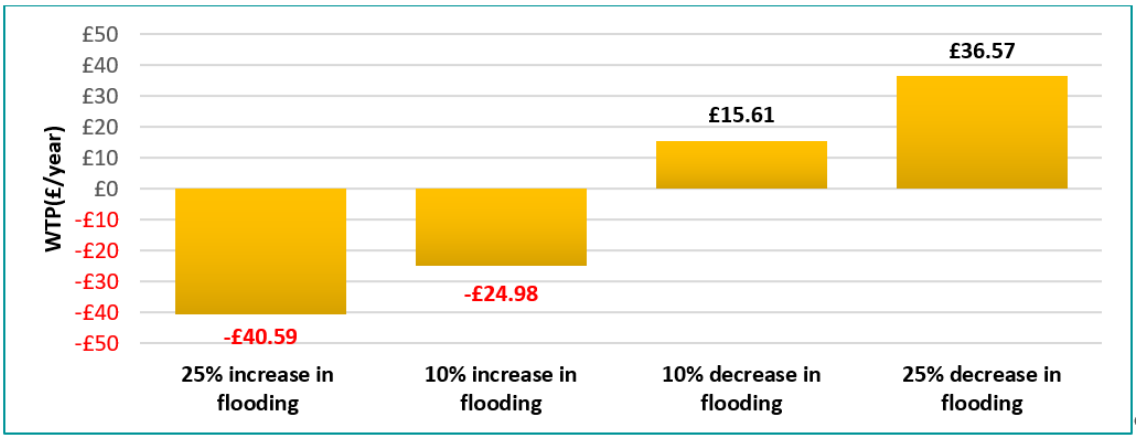


Figure 15: Value of carbon emissions impacts (% bill change)

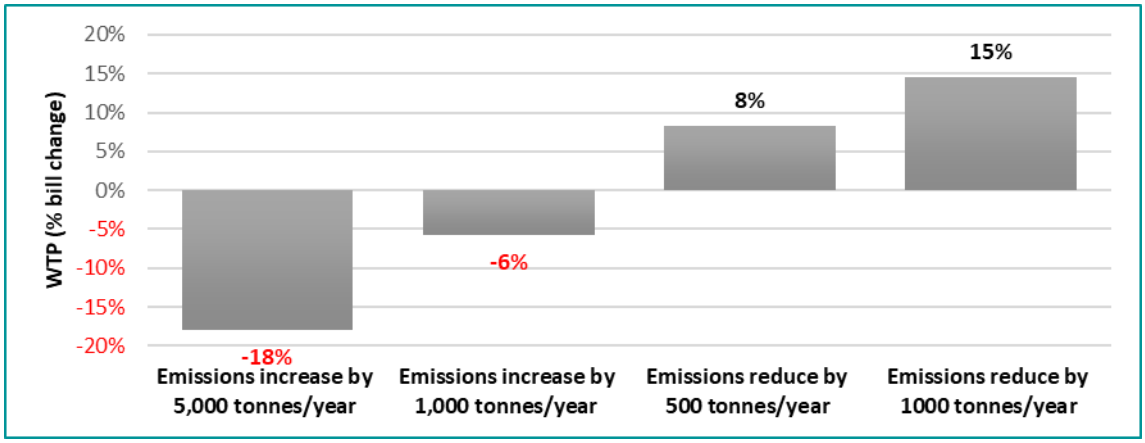


Figure 16: Value of carbon emissions impacts (£/year for an average household)

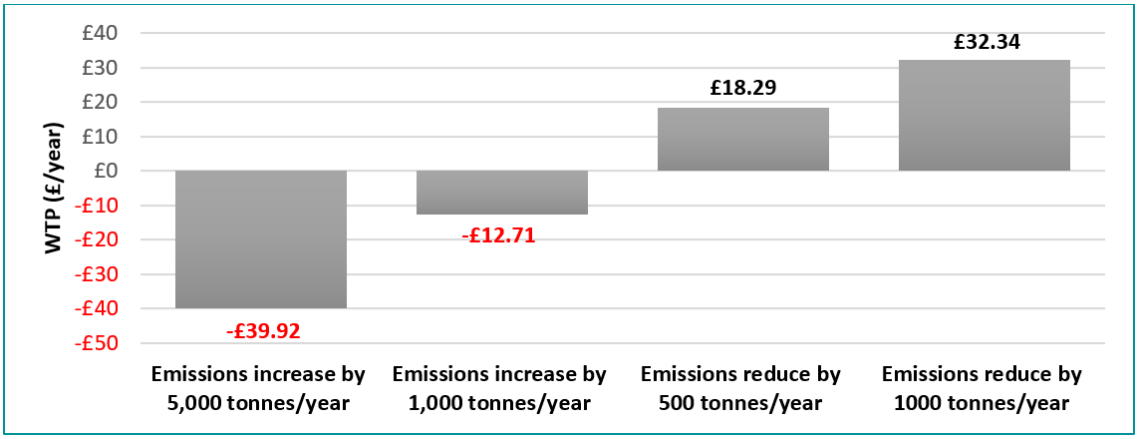


Figure 17: Value of river improvement impacts (% bill change)

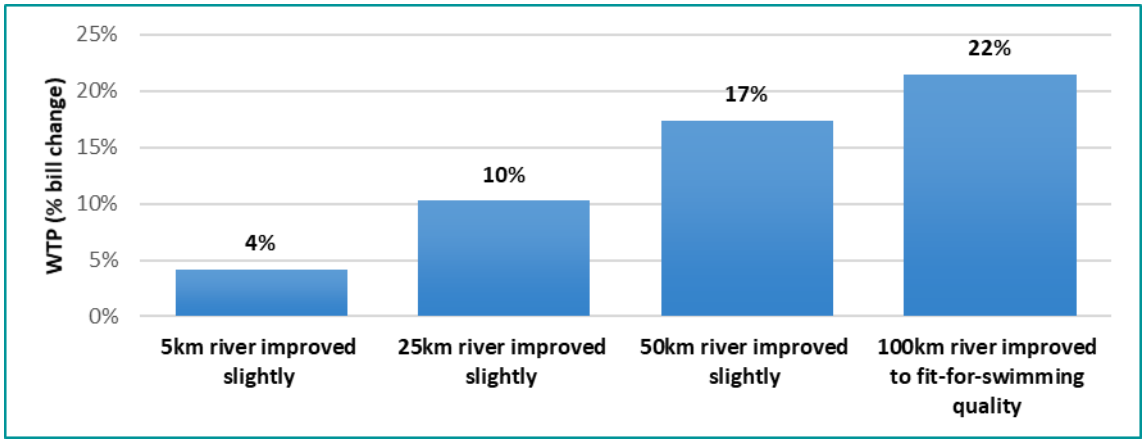


Figure 18: Value of river improvement impacts (£/year for an average household)

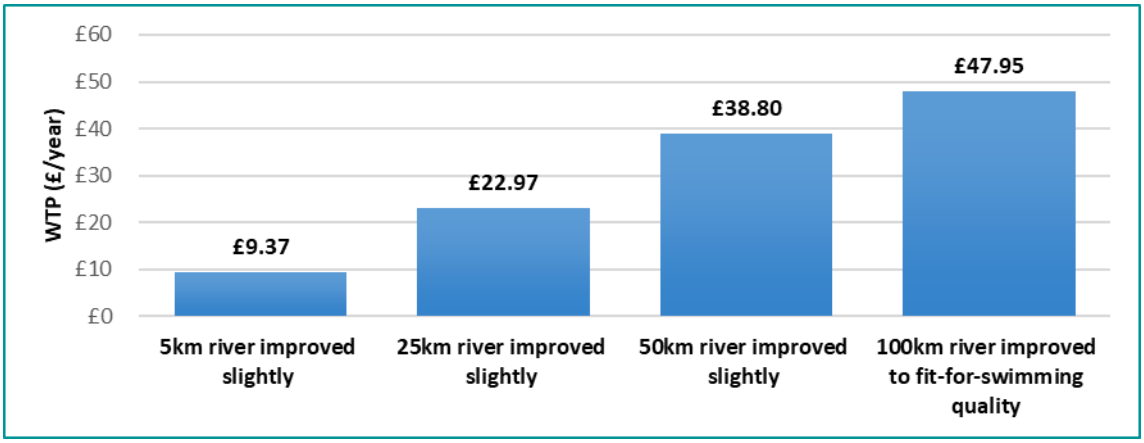


Figure 19: Value of local disruption impacts (% bill change)

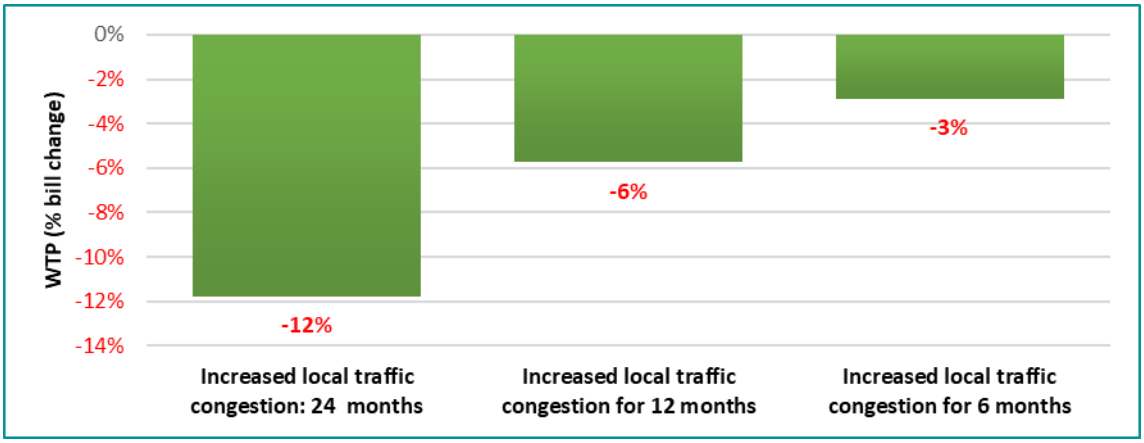
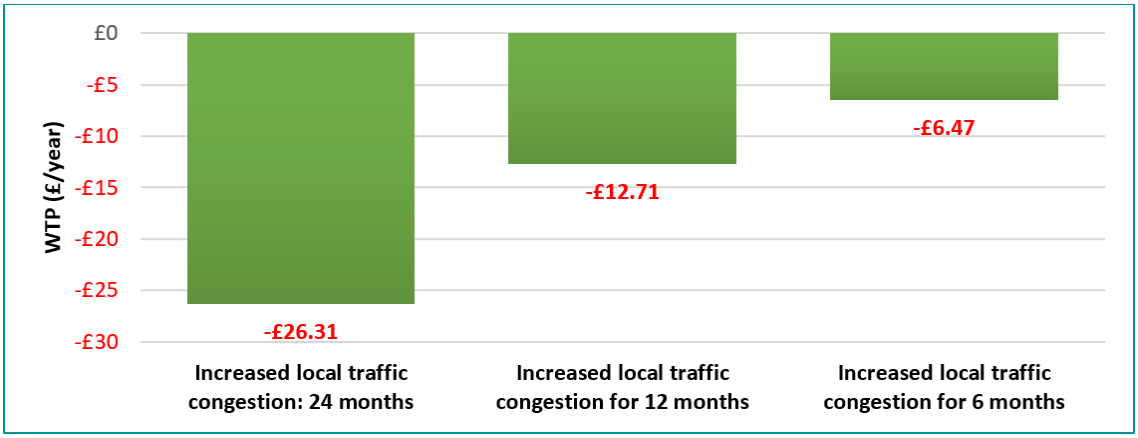


Figure 20: Value of local disruption impacts (£/year for an average household)



For our segmentation analysis, we used the individual-level estimated values for each of the impacts and assessed the statistical significance of differences in mean values between different customer segments via multiple t-tests. The segments considered were as follows:

- Region (Bristol, Somerset, Hampshire & Avon and Dorset)

- Age (18-29, 30-44, 45-64 and 65 plus years)
- Segmentation Code (AB, C1,C2 and DE) and
- Gender (Male and Female).

Overall, differences in mean values between most segments were not statistically significant (at 5%) with some exceptions shown in the table below.

Table 17: SP2-Statistically significant differences in WTP across customer segments

	Generic Options	WTP (% bill change)	
AGE	25% increase in flooding	Age 18-29 years: -15%	Age 65 plus years: -21%
	25% increase in flooding	Age 45-64 years: -16 %	Age 65 plus years: -21%
	25% decrease in flooding	Age 18-29 years: 15%	Age 65 plus years: 17%
	25% decrease in flooding	Age 45-64 years: 16%	Age 65 plus years: 17%
SEG CODE	25% increase in flooding	Seg AB: -22%	Seg DE: -14%
	25% increase in flooding	Seg C1: -19%	Seg DE: -14%
	Emissions increase by 5,000 tonnes/year (eq to 300 households)	Seg AB: -19%	Seg DE: -15%
	Emissions increase by 5,000 tonnes/year (eq to 300 households)	Seg C2: -21%	Seg DE: -15%

3.7 Support for Alternative Generic Options

The purpose of the SP3 exercise was to test customers' acceptability of the various GOs. Accordingly, participants were shown key information about each option, a few options at a time, and then provided with a summary of the options with hover buttons for participants to recover the more detailed information about each one if desired.

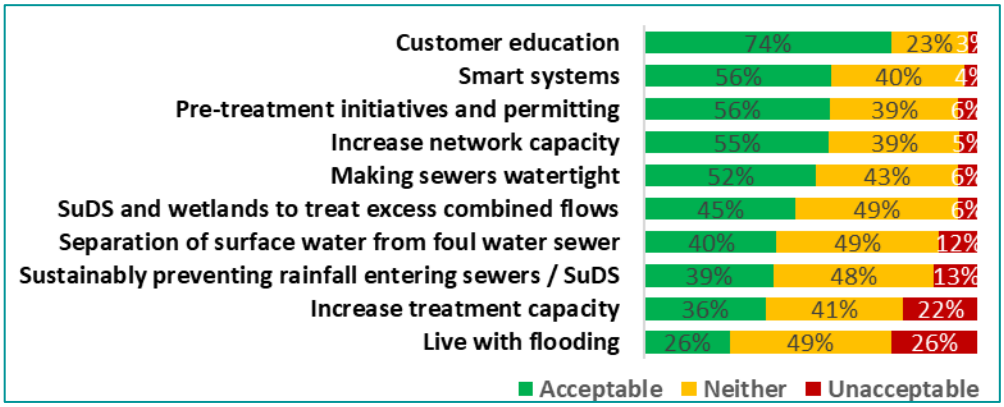
The survey then asked:

1) if any of the options was unacceptable and, if so, why?
2) if any of the options seemed particularly appealing and, if so, why?

The results from the SP3 analysis are presented in Figure 21 and Figure 22. Figure 21 shows that "Customer education" was most acceptable and "Live with flooding" was the least acceptable.

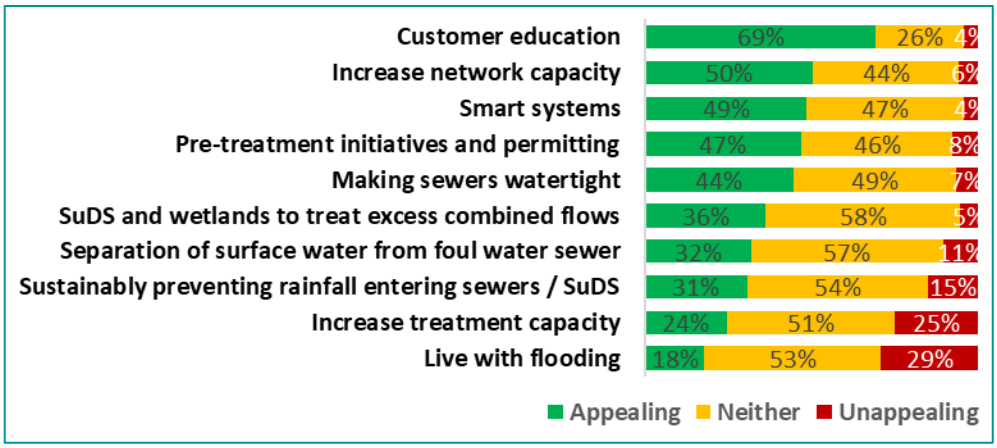
Figure 22 shows that the appeal of "Customer Education" is the highest among all the GOs. Similarly "Live Flooding" is considered to be the most unappealing of all the GOs

Figure 21: Acceptability of GOs



Base: Total=1,084

Figure 22: Appeal of GOs



Base Total=1,084

The following tables show the reasons given by customers why particular options were unacceptable or appealing.

Table 18: Reasons why wastewater treatment works options were unacceptable

Reasons why Increase in treatment capacity was unacceptable
Because it doesn't reduce sewage flooding
Because of the incidence of sewer flooding which is ALWAYS a bad outcome.
Because there's too many options in red
Carbon increase
Higher cost
Other routes should be explored first, such as mandating acceptable material the public is allowed to dispose of
The effect on rivers - what is put back in
Reasons why Pre-treatment initiatives and permitting was unacceptable
Again, mandate acceptable public waste
Because it doesn't reduce sewage flooding
My considered opinion.....but I know very little about cause and effect in this capacity.
It looked to me like flooding would be as bad and all the others would not be too good, except emissions would be better
I am concerned about the cost but also worried about flooding
Due to poor impact on local rivers
Too expensive. People do not have the resources for increased costs.

Table 19: Reasons why wastewater treatment works options were appealing

Reasons why Increase in treatment capacity was appealing
As the population and number of households continues to grow the need for increasing capacity will come with it
Increase in population
I assume the volume of water needing treatment is going to increase substantially over the years due to new building and population increase so developing new ways to increase treatment capacity seems the logical thing to do
The future will be greater population which will require more treatment requirements.
The population is getting bigger, more water to process
I trust Wessex water to do the right thing
It is important to keep up with building industry and put in measures to avoid flooding
Looks like things are being improved
We always should seek improvements and efficiencies.
Because it will hopefully reduce the risks of flooding and river pollution
Cost
It improves the quality of rivers to swim in
Less pollution of rivers
I presume that means there would be fewer occurrences of raw sewage being pumped into rivers/ sea
Reasons why Pre-treatment initiatives and permitting was appealing
Reduced carbon emissions and reduced cost of water bill are appealing
Cost is relevant when on a pension that does not keep pace with inflation.
No change in flooding incidents, however, there is a large gain in smaller emissions, less impact on rivers, less local disruption, and cheaper

Because numbers are better than other
Better scores for the environmental point of view
Good impact on carbon emissions
Has a better impact on environment
Lower carbon cost and pushes responsibility up towards the source of pollution needing treatment
If it means less disruption then in my books in is doing more good due to less emissions
It results in better carbon emissions outcomes
Better use of resources and less damage to the environment
It would prevent flooding and pollution increases.
It's very hard as its good in some areas but not in others , I am looking more at the low carbon emissions
On balance this option would appear to have the most benefit.
Reduced carbon emissions
Sounds better for the environment
To reduce the impact on the environment
We always need innovation in such things.

Table 20: Reasons why customer side management options were unacceptable

Reasons why Customer education was unacceptable
Because most people with common sense don't abuse the wastewater system. Those who do are those who will continue to do so, whether or not an education programme is undertaken. Don't waste money on trying to educate the stupid
Spoon feeding people. Most know what should be flushed and it's laziness if they don't
Some people already have a good knowledge of what they should and should not be doing regarding the use of their water supply. Sadly, there are too many people in this country that do not care a dam about 'doing the right thing'. Therefore it is a waste of time and money. Personally, I think it is a good idea, but too many people wouldn't even be bothered to read it
I would prefer to see a bigger advantage given to the protection of rivers
Because it does nothing to prevent the company to dump raw sewage in the rivers.
Not enough benefit on rivers
Reasons why Separation - Sustainably preventing rainfall entering sewers / SuDS was unacceptable
There doesn't seem to be any significant benefit of it
Because of the low returns
Little improvement on any areas
Separation appears high cost with little benefit
Cost is increased
The cost
Increasing the cost of the bills just because people are not properly educated on what they can and cannot flush down the toilet is simply unacceptable.
The cost is too high , It needs customer education which would cost a lot less
Where will the rain water go? Living somewhere that floods already, it is of concern that flooding will become more prevalent
Expensive; significant environmental impact. Customers are not targeted to change habits.

Table 21: Reasons why customer side management options were appealing

Reasons why Customer education was appealing
An informed customer base is always to be sought.
Can make vast improvements with little extra cost
Anything individuals can do to improve water quality/ wastage has to be appealing.
As a result of customer education maybe separation will be less needed.
Because if it was to work there would be a lot of benefits.
Because it looks like a good thing all round
Because it may tackle the problem of wet wipes etc. being flushed away which is such a big problem
Because it's important to understand how the process works
Benefits across the board
Better scores and the more consumers know the better
Water industry a mystery to most of us. If people understood why certain behaviours are necessary, they'd be more likely to cooperate
Customers and importantly, other members of a household or business, who understand how the water supply and disposal system works are more likely to adopt best practice to achieve benefits for the environment and for themselves
Giving knowledge out to people about water usage is very positive
Good outcome limited impact on cost
I have seen instances on the news of problems caused by people pouring things down drains and old toilets
It seems to be the best option
It is better than nothing but many people will disregard it
It leads to better results
It sounds affordable
It's a good plan
It's a simple fix if everyone is prepared to do their bit
It's a win-win situation even if it is more costly
Just that it sounds more appealing
Low cost and good results
People should know the impact flushing the wrong items down the toilet causes.
There should be more taught about it
Will reduce blockages and disruption
Without educating your customers it's going to be a costly and pointless decision
Your product or service should help customers do what they do best, and do it.
Reasons why Separation - Sustainably preventing rainfall entering sewers / SuDS was appealing
Because it has a positive impact
Because it's better for the environment
Because it obviously works.
If separated would pay off in the long term
It is a long term solution
It makes sense to stop excess water entering the system
It saves overloading the sewers
It will hopefully help prevent excess flooding
Less disruption
Low cost solution separating the large quantity of rain from the smaller quantity of sewerage
Reduction in processing is highly desirable but the cost is probably too great

Seems appropriate.
Waste water harvesting technology already exists, use it. All new builds should include these items
Rainwater doesn't require wastewater treatment, so its appealing to not waste time and resources treating it
The fact that the sewage works are overwhelmed by the water run off after rain storms is appalling to me. If this could be separated out from the grey water it must help, though of course be expensive. If the water from my sink could be treated separately from that from the toilet it would be nothing short of miraculous.

Table 22: Reasons why surface water management options were unacceptable

Reasons why Separation - Traditional surface water sewers was unacceptable
Because numbers are low
Its not acceptable as the graphic implies that the carbon footprint impact would be significant.
Even if it's a change that's going to be good for you, there will still be huge life adjustments that need to be made. Don't take bad feelings as a stop sign
High level of emissions
Impact on carbon emissions
Impact to local status
I'm worried about carbon emissions at a time when we urgently need to be reducing them.
Sounds overkill, very expensive and very disruptive. Not climate friendly
High emissions for relatively high cost
High cost implication
Reasons why SuDS and Wetlands to treat excess combined flows was unacceptable
Not enough impact and too expensive
Because the positives don't seem to warrant the negatives. Higher carbon footprint with little impact on river quality
Sewage should be treated in a closed environment. Using wetlands will contaminate soil and harm aquatic life. If a separate surface system is used there is less chance of contamination
I'm not sure I have fully understood the concept, but it sounds like rainwater could be contaminated and passed straight back into the rivers which is not ok
It will inevitably affect wetlands negatively

Table 23: Reasons why surface water management options were appealing

Reasons why Separation - Traditional surface water sewers was appealing
Because it is betting for the environment
Better environmental practice
Less pollution in rivers
It seemingly has the greatest positive benefit for river quality and wildlife
Essential to reduce sewage spilling into rivers. Increased carbon emissions should only be during build phase
It will help prevent excess flooding hopefully and keep the waterways and rivers cleaner
It would be good to create more fresh water environments
Its the more effective option , cost a bit more but the wetlands would benefit
Want foul water to mix as little as possible

Must be done for hygiene
Reduces flood risk
Surface water can be discharged into watercourses without treatment meaning less waste water needs treating lowering costs.
Surely that's a no brainer, separation of 'clean' surface water from sewage decreases the amount that needs treatment
Much surface water is non-toxic and should not need treatment. If surface water enters foul drains it increases the likelihood of sewage flooding which is far more damaging to homes, It is up to Highways to are affected by surface water damage which Highways/Environment Agencies to deal with surface water in a proper manner
To reduce processing of large volumes
To separate will help flush enclosed systems
It is a good long term solution
Would seem to be the best long term solution and a logical way to deal with it.
Reasons why SuDS and Wetlands to treat excess combined flows was appealing
Because it is better for the environment
Because there has been much publicity about flooding etc. in these areas for years
Using natural solutions is more sustainable and long tern, and needs to part of the solution
To increase/improve habitats and try to put more captured rainwater and “clean” surface water back into rivers and aquifers, which would also boost river levels reduced by abstraction
Sustainable wetlands appears to me the way forward, creating habitat for wildlife on the way
Good all round and low costs
It seems to make more sense than overloading existing system
Just sounds better
Managed properly it would be better for the environment.
Seems sensible
Sounds sustainable and eco friendly
The word sustainable would mean this work should last for a long time.
Too many flood plains have been built on already - we need a system such as wetlands
What is there not to like, new habitat creation, local infrastructure
That fact they are sustainable and provide wetlands and show some improvement on CO2 emissions
Although it does not have strong improvements across the sectors, it is not increasing the carbon foot print unlike the other option provided.

Table 24: Reasons why combined and foul sewer system options were unacceptable

Reasons why Increase network capacity / build underground tanks was unacceptable
The cost and the disruption that is causes is unacceptable to me
Could lead to more issues like blockages, extra work for employees etc
Infrastructure building is a lazy way to try and alleviate an increasing problem
Like the roads, the more you build the fuller they will become
Not enough benefit compared to other options
Too many negatives for too little benefit
Reasons why Live with flooding, but reduce impact of flooding (mitigation)was unacceptable
Any flooding is damaging to the environment, communities and livelihoods.
Flooding causes too much misery for people and should be prevented at all costs.
Flooding is such a growing problem a lot more needs to be done not just reducing its impact

Flooding should be as unacceptable as lying in Parliament.
I don't know if this will be workable
I think in present climate changing conditions it would be impossible to predict amount of flood water
It is only a partial solution which means that further expenditure will be required
Nobody wants flooding and it should be prevented
Nobody wants flooding due to the disruption it causes. I don’t see what the mitigation you can give is.
Nobody wants to be flooded and would rather have no flooding at all given the option
Because the impact on our rivers is too high a risk.
Reasons why Making sewers watertight to prevent groundwater inundation was unacceptable
Flood and river impact
not worth the negative impact on other aspects
Expensive as heck and too much of a risk for that to be passed to consumers
No outstanding benefits to any area
Poor outcomes on all indicators
Reasons why Smart Systems was unacceptable
Ah, another high tech disaster & cost overrun looms. Start with something simple like a smart motorway or NHS
Smart things can easily go wrong and are susceptible to cyber crimes
Minimal improvements to services at high cost
Not much improvement to river water quality and not enough reduction in flooding.

Table 25: Reasons why combined and foul sewer system options were appealing

Reasons why Increase network capacity / build underground tanks was appealing
Because more houses are being built
Because time has moved on. More people and more home use.
There are more houses than ever being built and our population is growing. Most of the main sewers in this nation were built in the 1800's.
Got to keep up with the population increase
Greater population in the future
The demand is only going to continue going up
It is the only longer term solution
It reduces pollution in rivers
It will work more quickly
Low cost and disruption
Means more waste water being taken away
Reducing the risk of flooding and improving river quality is excellent, the cost not so much .
Because there is more chance of the sewage not overflowing and causing damage
Saving water is always a good option.
This is a complex situation and I am torn between the options. Reducing sewage flooding is always appealing.
This should help with future problems.
To get rid of water
Water is a strategic resource: we should do all that we can to do all that we can to husband such resource as best we can.
What needs to be done should be done and I believe network capacity is a positive
Will go some way towards reducing contamination

Would be a positive way to deal with possible impacts of flooding by increasing capacity.
Reasons why Live with flooding, but reduce impact of flooding (mitigation)was appealing
Algorithms will never produce answers to total removal of flooding
Flooding is not appealing at any level
I do not like “living with flooding", but where possible we should mitigate it effect.
Living in Dorset/Somerset, flooding is a factor and norm of the area we live in. If it can be better controlled but not completely omitted, I’d be happy with that and any effort made.
We cant stop flooding... only reduce the impact
Flooding will always occur particularly with rising water levels and Climate Change and it must be mitigated as it cannot be wholly prevented.
Limiting the impacts is better if the flooding can't be stopped
Natural or floods to occur.
Prepared to do almost anything to protect my home
Think we will have to do this
Reasons why Making sewers watertight to prevent groundwater inundation was appealing
Anything we can do to prevent flooding can only be good.
As long as the extra water goes somewhere that does no harm
Flooding is physically and emotionally devastating
To stop flooding of the old systems so that sewage does not escape and mix with rivers or contaminate ground
Help prevent leaks which can cause dirty water entering waterways etc.
I would not like my home flooded
It makes sense
It's safer
Low cost and good prevention
Maximizes use of existing infrastructure
No flooding
Not even sure this would work but surely reducing groundwater flooding has to be good.
Obviously suitable for modern living.
Sewers need to be made as tight as possible to prevent flooding
Sewers should not be allowed to discharge in an uncontrolled manner.
Stop flooding
Stops leaks
The damage to homes and the environment caused by sewers flooding to the land is unacceptable
All sewers should be watertight so there is no escape of foul waters etc.
Sewers should be watertight to avoid leakages which have severe environmental and health impacts
Would reassure as no one wants a sewer to leak.
Reasons why Smart Systems was appealing
Smart systems could identify problems remotely before they turn into a disruption event, so have lots of benefits.
We have the technology so let us use it
Data is source of information and information gives power to make the right changes and decisions
Because that’s the way life is going
Because they seem positive on all measures
Best return
Better than old systems
Can be ran digitally at a lower cost
Easy to use and monitor

I presume a better level of control
If it can improve our overall use of the finite resource, which is water, it cannot be wrong.
If technology can improve the situation and provide a better way forward thats good all round.
It appears to be very acceptable
More control over what is happening .
New techniques to manage a system which has not changed in 100 years plus
Not sure how they would work but hopefully will help control an issue before it gets out of hand
Out of all the options this seemed the best compromise
Presumably this would increase efficiency in all areas or waste disposal and dealing with problems.
Required in this day and age.
Smart system is there to help keeping water usage under control
Because it seems like a sophisticated and well balanced solution
They pick up on faults more quickly
To speed up response to problems
Use of all ways to reduce problems is appealing, but false and corrupt data can make a mockery of system analysis

The results of the SP3 exercise can be linked into the more detailed feedback from the qualitative research. This is discussed in the following section.

3.8 Comparison with Qualitative Research Findings

Qualitative research was undertaken ahead of the quantitative research. This sought to identify customer views on drainage and wastewater management whilst also analysing customers responses to the GOs presented.

Qualitative engagement was tailored to appreciate the level of expertise from participants. Household customers were split by type, region, vulnerability, and experience with flooding. These customers were all reconvened from the strategic direction statement (SDS) research, except for those who experienced a flooding – these were new recruits specifically selected for this study.

Non-household customers were split by sector: manufacturing, construction, hospitality, events, catering. Non-household participants were a mixture of new recruits and reconvened recruits from SDS research.

The qualitative research re-confirmed that consumers have very limited knowledge and understanding of drainage and wastewater (especially those with no experience of any issues). It provided valuable feedback on survey content and the need for contextual information, for example highlighting terminology that would need either careful rephrasing or additional contextual information such as catchment initiatives and permitting, SuDS and 'no-dig' technology.

In addition, insight from the qualitative research provides a form of triangulation with the quantitative data. Below we highlight areas of consistency, and identify areas where we see differences in results.

Support for Generic Options

Generic options were discussed in the qualitative research. A slightly longer list was explored than was tested quantitatively so qualitative feedback is provided only for comparable options. The feedback to the GOs was largely consistent with the quantitative results identified:

The **wastewater treatment works** options tested qualitatively intuitively made sense to customers on first review. Increasing treatment capacity raised concerns over the costs and there was a request for carbon offsetting, especially among younger participants. Pre-treatment initiatives also raised concerns that this could introduce chemicals into the process which would have a detrimental effect on health and the environment. As in the quantitative research, these options had limited appeal.

For **customer side management,** customer education was generally agreed in the qualitative sessions to be necessary and in the quantitative research this was the most appealing and acceptable of all the GOs tested overall. However, some expressed concerns that this may have limited effectiveness, as Wessex Water already do spend money educating users without resulting changes in behaviour. This sentiment was echoed in the quantitative survey among the small number of participants who did not find this option appealing.

The **surface water flooding options** tested had mixed appeal as identified quantitatively. Separating flows had a slightly higher appeal than the use of SuDS and wetlands to treat excess combined flows due to the perceived negative impact on habitats. However, there were concerns due to the cost implications, and the limited impact on both the number of incidents and carbon emissions (both quantitatively and qualitatively).

Of the **combined and foul water systems** tested qualitatively, increasing network capacity proved most popular, as in the quantitative survey, and was felt to be an effective solution. Smart systems was the next most appealing, although there was some uncertainty around the potentially limited reduction in incidences. There were expectations that Wessex Water should be making sewers water tight anyway, so these solutions offered less appeal when discussed qualitatively.

Willingness to pay for reduced flooding

Willingness to pay for reduced flooding was discussed qualitatively, with a static 7.5% bill increase tested. Many felt this was fair and warranted in order to make improvements for future generations, and ensure nobody had to experience sewer flooding. However, some expressed concerns due to either general economic uncertainty, or the fact that the low number of incidents meant flooding was unlikely to happen to them. This is largely consistent with the quantitative participant feedback provided on the WTP exercise SP5 (see Table 9).

Timing of investment

The timing of the investment was probed in both the qualitative and quantitative engagement, with the same timing options outlined (as indicated in Table 12) though it should be noted that the cost increases shown in the qualitative exercise were static, whilst in the quantitative survey this was dependent on which SP design was selected.

There was general agreement that investment is required in both the qualitative and quantitative engagement. However, the timing of investment differed slightly. Whilst in the quantitative survey, 43% selected option B1 (invest by 2030), in the qualitative discussions option B2 (invest by 2035) was seen as the fairer timescale/payment plan. This was the least selected option in the quantitative survey.

In the qualitative discussions, investing by 2035 was felt to represent a 'middle ground' as 25 years felt too long for improvements (B3) but some felt option B1 (higher price rises followed by high bills for longer) was unacceptable.

Overall, the feedback was thus largely consistent between the quantitative and qualitative elements of the research. Combining both sources together thus results in a more insightful evidence base altogether.

4 Conclusions

The principal objectives of this study were to understand customer views on issues related relating to wastewater drainage, including the type and frequency of sewer flooding; willingness to pay for improvements in service; the timing of bill and service impacts; and attitudes towards potential generic options (GO) for inclusion in the DWMP.

In line with these research objectives, a programme of quantitative engagement was conducted to design and implement stated preference surveys of Wessex Water customers, focused around a number of stated preference exercises conducted over two surveys.

A total of 2,181 fully completed interviews were achieved across both the surveys and covered household, non-household and vulnerable customers.

The key findings were as follows:

- Customers preferred flooding away from their houses, rainwater sewer flooding to foul/combined sewer flooding and less frequent flooding, as expected.
- Mean WTP for reduced flooding was 19% of the annual wastewater bill per year. For an average household paying an annual water bill of £223, this implied a mean WTP for reduced flooding of £42.37 per year.
- Customers preferred that Wessex Water invests to reduce sewer flooding rates in the period 2025-2030 rather than spread investment out over a longer period, all else equal.
- Customer values for DWMP option impacts on flooding, carbon emissions, rivers and local traffic congestion varied in line with expectation.
- A comparison of the GOs showed that “Customer education” was most acceptable and appealing to customers; while “Live with flooding” was least acceptable and least appealing.
- A segmentation analysis of the results from the choice exercises showed that values were quite similar across most customer segments i.e., region, age, gender and segmentation code, with few significant differences.

Overall, there are several indications of validity and reliability of the valuations.

- Our findings were obtained from a sample of Wessex Water customers that had good coverage of all the four drainage regions. Further, the survey data was weighted to be representative of the profile of Wessex Water customer base.
- There were very few instances of non-trading behaviour and the vast majority of participants found that choices were easy to understand, and they were able to make comparisons between the options presented to them.

- Results and valuations varied in line with expectations. For example, customers preferred flooding away from their houses, rainwater sewer flooding to foul/combined sewer flooding and less frequent flooding.
- Differences in Mean WTP values across most customer segments i.e., region, age, gender and segmentation code were not statistically significant (at 5%) with very few exceptions
- The reasons given for participants' responses were consistent, in the vast majority of cases, with their answers to the key choice questions.

Overall, the valuations and additional results obtained can be considered robust and reliable for use in Wessex Water's Drainage and Wastewater Management Plan.

Appendix A

Survey A and Survey B Questionnaires

Q1	SYSTEM INFORMATION:
Q2	DELETE IF ONLINE Interviewer number:
Q3	DELETE IF ONLINE Interviewer name:
Q4	Date:
Q5	Time interview started:

FOR YOU. FOR LIFE.
Wessex Water
YTL GROUP

TELEPHONE: NHH

Good morning/afternoon/evening. My name is ..... from Accent and I am carrying out research for Wessex Water. Wessex Water are currently developing a Drainage and Wastewater Management Plan and are keen to hear the views of businesses as they are the company that takes away and treats your business' wastewater and, may also, provide your business with clean water. However, another company, a water retailer, will look after other services related to your business water needs such as meter reading, customer services and billing.

Wessex Water treats millions of litres of wastewater every day. This is water that has entered the sewerage network from homes and businesses after it has been used for showering, flushing the toilet, commercial activities, industrial processes and, in most areas, rainwater and runoff is also drained into the sewer system.

Their plans look 25 years to the future and so is considering the challenges of urban growth and climate change plus potential investment options and their impacts on customer bills.

The research is being conducted under the Market Research Society Code of Conduct, which means that any answers you give will be treated in confidence.

The survey will take around 20 minutes to complete. Can I just ask you a few questions to check that you are eligible to take part in this research?

This call may be recorded for quality control purposes.

NOTE TO INTERVIEWER: SAMPLE SOURCE IS: #sourcetext#

INTCHECK. **INTERVIEWER**: PLEASE CONFIRM YOU HAVE ADVISED THE PARTICIPANT OF:

MRS Code of Conduct
Calls being recorded

INTCHECK2. **INTERVIEWER:** PLEASE CONFIRM YOU HAVE ASKED AND CHECKED THAT THE PARTICIPANT IS **NOT** TAKING THE INTERVIEW ON A MOBILE DEVICE WHILE DRIVING OR OPERATING EQUIPMENT

Yes, it is safe for the participant to proceed
No, it isn't safe – we need to call back later GO TO APPT SCREEN

FACE TO FACE: HOUSEHOLD

Good morning/afternoon/evening. My name is ..... from Accent and I am carrying out research for Wessex Water – they are keen to hear the views of a variety of customers to help inform their future plans for drainage and wastewater management.

Wessex Water treats millions of litres of wastewater every day. This is water that has entered the sewerage network from homes and businesses after it has been used for showering, flushing the toilet, commercial activities, industrial processes and, in most areas, rainwater and runoff is also drained into the sewer system.

Their future plan will look 25 years to the future and so considers the challenges of urban growth and climate change, a range of investment options and their impacts on customer bills. Hearing customer views is an important step in developing the plan.

The research is being conducted under the Market Research Society Code of Conduct, which means that any answers you give will be treated in confidence.

The survey will take around 20 minutes to complete. We appreciate the time you'll spend giving your feedback for Wessex Water. As a thank you we'd like to provide you with a £5 voucher.

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

ONLINE

FOR YOU. FOR LIFE.

Wessex Water

YTL GROUP

Thank you very much for agreeing to **complete** this on-line survey which is being conducted by Accent, on behalf of Wessex Water. The closing date for completion of this survey is Sunday 26th September 2021.

Wessex Water are keen to hear the views of a variety of customers and stakeholders to help inform their future plans for drainage and wastewater management.

Wessex Water treats millions of litres of wastewater every day. This is water that has entered the sewerage network from homes and businesses after it has been used for showering, flushing the toilet, commercial activities, industrial processes and, in most areas, rainwater and runoff is also drained into the sewer system.

Wessex Water are currently developing a Drainage and Wastewater Management Plan which looks 25 years to the future and so considers the challenges of urban growth and climate change, a range of investment options and their impacts on customer bills. Hearing customer views is an important step in developing the plan.

The survey will take around 20 minutes to complete and we will just ask you a few initial 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. If you would like to confirm Accent's credentials type Accent in the search box at: https://www.mrs.org.uk/researchbuyersguide.

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.

Looking after your data

Q1. **ASK ALL:** Looking after your data: any data collected over the course of this interview that could be used to identify you will be held securely and will not be shared with any third party (including Wessex Water) unless you give permission (or unless we are legally required to do so). Our privacy statement is available at https://www.accent-mr.com/privacy-policy/.

Do you agree to proceeding with the interview on this basis?

Yes
No **THANK AND CLOSE DP NOTE THANK AND CLOSE MESSAGE FOR HOUSEHOLD AND EMPLOYEES SHOULD READ: "THANK YOU FOR TAKING THE TIME TO ANSWER THOSE QUESTIONS. WE'RE SORRY BUT ON THIS OCCASION WE ARE LOOKING FOR OTHER TYPES OF CUSTOMERS. HOWEVER, IS THERE ANYTHING YOU WOULD LIKE TO TELL US ABOUT WESSEX WATER BEFORE WE CLOSE THE SURVEY?"**

DP – GENERAL 'THANK AND CLOSE' TEXT UNLESS OTHERWISE SPECIFIED: **THANK YOU FOR TAKING THE TIME TO ANSWER THOSE QUESTIONS. WE'RE SORRY BUT ON THIS OCCASION WE ARE LOOKING FOR OTHER TYPES OF CUSTOMERS.**

About you

Q2. **ASK CAPI ONLY. OTHERS GO TO Q6:** In line with government guidelines we have a few questions to check your Covid-19 status. Are you or anyone you have been in close contact with currently experiencing any flu-like symptoms or other Covid-19 symptoms?

INTERVIEWER NOTE: THIS WOULD INCLUDE HIGH TEMPERATURE AND/OR LOSS OF SENSE OF TASTE OR SMELL

Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q3. Have you or anyone you have been in close contact with been diagnosed with Covid-19 within the past two weeks, and not subsequently tested negative

Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q4. Are you someone who is defined as either Clinically Extremely Vulnerable or Clinically Vulnerable?

INTERVIEWER NOTE: THEY WILL HAVE BEEN INFORMED OF THIS STATUS EARLY ON IN LOCKDOWN
Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q5. Are you currently shielding to protect yourself from Covid-19 or caring for someone else who is especially vulnerable to Covid-19?

Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q6. **ASK ALL:** Are you currently in paid employment? (including being self-employed)

Yes
No **ONLINE / CAPI GO TO Q11**

Q7. **ASK IF Q6= 1**: How much involvement, if any, do you have in managing the water bills for the organisation you work for?

I solely or jointly manage the bills **GO TO Q8**
I don't have any involvement in the bills **GO TO Q11**

Q8. Are you a sole trader working from home and with no separate business premises?

I am a sole trader and have no separate business premises **GO TO Q11**
I work in a separate business premises **GO TO Q9**

HH = CODE 2 AT Q6 OR CODE 2 Q7 OR CODE 1 AT Q8
NHH = CODE 2 AT Q8

Q9. **ASK NHH ONLY:** How many sites does your organisation have in the UK?

One site
More than one site
Don't know

Q10. **ASK IF Q9 = 1** Is this site **ASK IF Q9=2-3** Are any of these sites in any of the areas shaded green in the map below? NOTE TO INTERVIEWER - Can be either light or dark green

Yes **CODE AS NHH**
No **CODE AS HH, SHOW TEXT BELOW AND THEN GO TO Q11**
Don't know **CODE AS HH, SHOW TEXT BELOW AND THEN GO TO Q11**

IF CODES 2 OR 3 We would like you to respond to this survey as a household customer of Wessex Water

---

Q11. **ASK HH ONLY:** Are you the person, or one of the people, in your household who pays the water bills at home? **SINGLE CODE**

I have complete responsibility for payment
I share responsibility for payment with others in my household
I have no responsibility, but I know it is paid by my landlord and included in my rent
I have no responsibility for payment and I don't know who pays the bills
Other - please tell us what
Don't know **THANK & CLOSE**

Q12. **ASK HH ONLY:** Do you or any of your close family work in market research or for a water company (including working for Wessex Water)? **SINGLE CODE**

Yes **THANK & CLOSE**
No

Q13. **ASK HH ONLY**: Who supplies clean water services (i.e. the water that comes out of your taps) to your home?

ASK NHH: Which company provides your organisation with clean water?

Wessex Water
Bristol Water
Bournemouth Water
Other **THANK & CLOSE**
DP NOTE THANK AND CLOSE MESSAGE FOR HOUSEHOLD AND EMPLOYEES SHOULD READ: "THANK YOU FOR TAKING THE TIME TO ANSWER THOSE QUESTIONS. WE'RE SORRY BUT ON THIS OCCASION WE ARE LOOKING FOR OTHER TYPES OF CUSTOMERS. HOWEVER, IS THERE ANYTHING YOU WOULD LIKE TO TELL US ABOUT WESSEX WATER BEFORE WE CLOSE THE SURVEY?"

DP – GENERAL 'THANK AND CLOSE' TEXT UNLESS OTHERWISE SPECIFIED: **THANK YOU FOR TAKING THE TIME TO ANSWER THOSE QUESTIONS. WE'RE SORRY BUT ON THIS OCCASION WE ARE LOOKING FOR OTHER TYPES OF CUSTOMERS.**

HH QUOTAS:
350 Wessex
175 Bournemouth Water
175 Bristol Water

Q14. Who provides wastewater (sewerage) services for your [if HH] home [if NHH] organisation?

Wessex Water
Other **THANK & CLOSE**

ASK ALL: QBILL1 IF WESSEX OR BRISTOL AT Q13 ASK: How much is your water bill? NHH: How much is your organisation's water bill? **You can provide the amount either weekly, monthly, quarterly, half yearly or annually. ONLINE: Simply pick the time period from the drop down box**

Weekly: £
Monthly: £
Quarterly: £
Half yearly: £
Annual: £80
Don't know **CATI: DO NOT READ OUT**

DP CALCULATE ANNUAL BILL AND THEN CALCULATE SEWAGE AS 49% OF ANNUAL AMOUNT. FOR 'DON'T KNOW' USE £223

QBILL2 IF BOURNEMOUTH AT Q13 ASK: You should get a separate bill from Wessex Water for your sewerage services. How much is your sewerage bill? NHH: How much is your orgainsation's sewerage bill? **You can provide the amount either weekly, monthly, quarterly, half yearly or annually. ONLINE: Simply pick the time period from the drop down box**

Weekly: £
Monthly: £
Quarterly: £

Half yearly: £
Annual: £
Don't know **CATI: DO NOT READ OUT**

DP CALCULATE ANNUAL WASTEWATER AMOUNT. FOR 'DON'T KNOW' USE £223

QBILL3 ASK IF QBILL1 AND QBILL2 NOT EQ 'DON'T KNOW' ELSE GO TO Q15. Is that the exact amount or an estimate?

Exact amount
Estimate

NHH GO TO MAIN QUESTIONNAIRE

Q15. **ASK HH ONLY:** Which ONE of the following best describes the occupation of the main income earner in your household? **If you or the main income earner are self-employed please tick the option that most relates to the type of work you/they do for the company(s) you/they work for.**

Higher managerial/ professional/ administrative (e.g. Doctor, Solicitor, Board Director in a large organisation 200+ employees, top level civil servant/public service employee etc.)
Intermediate managerial/ professional/ administrative (e.g. Newly qualified (under 3 years) doctor, Solicitor, Board director of small organisation, middle manager in large organisation, principal officer in civil service/local government etc.)
Supervisor; clerical; junior managerial administrative or professional (e.g. Office worker, Student Doctor, Foreman with 25+ employees, salesperson, etc.)
Skilled manual worker (e.g. Bricklayer, Carpenter, Plumber, Painter, Bus Driver, paramedic, HGV driver, pub/bar worker etc.)
Semi or unskilled manual worker (e.g. Caretaker, Park keeper, non-HGV driver, shop assistant etc.)
Student
Unemployed or not working due to long-term sickness
Casual worker – not in permanent employment
Full-time carer of other household member
Retired **GO TO Q16**
Rather not say **THANK AND CLOSE**

Q16. **IF Q15=10 (RETIRED). OTHERS GO TO Q18:** Does the main income earner have a state pension, an occupational or private pension or both?

State only
Occupational or Private only
Both

Q17. **IF Q16 = PRIVATE OR BOTH. OTHERS GO TO Q18:** How would you describe the main income earner's occupation immediately before retirement?

Higher managerial/ professional/ administrative (e.g. Doctor, Solicitor, Board Director in a large organisation 200+ employees, top level civil servant/public service employee etc.)
Intermediate managerial/ professional/ administrative (e.g. Newly qualified (under 3 years) doctor, Solicitor, Board director of small organisation, middle manager in large organisation, principal officer in civil service/local government etc.)
Supervisor; clerical; junior managerial administrative or professional (e.g. Office worker, Student Doctor, Foreman with 25+ employees, salesperson, etc.)
Skilled manual worker (e.g. Bricklayer, Carpenter, Plumber, Painter, Bus Driver, paramedic, HGV driver, pub/bar worker etc.)
Semi or unskilled manual worker (e.g. Caretaker, Park keeper, non-HGV driver, shop assistant etc.)

Student
Unemployed or not working due to long-term sickness
Casual worker – not in permanent employment
Full-time carer of other household member
None of these

Q18. **SEG: CODE AS FOLLOWS**:

IF **Q15**= 1 or 2; SEG = AB
IF **Q15**= 3; SEG = C1
IF **Q15**= 4; SEG = C2
IF **Q15**= 5-9; SEG = DE

IF **Q15**= 10 and **Q16**= State only; SEG = DE

IF **Q15**= 10 and Q16 = Private only OR Both and Q17 = 1 or 2; SEG = AB
IF **Q15**= 10 and Q16 = Private only OR Both and Q17 = 3; SEG = C1
IF **Q15**= 10 and Q16 = Private only OR Both and Q17 = 4; SEG = C2
IF **Q15**= 10 and Q16 = Private only OR Both and Q17 = 5, 6, 7, 8, 9; SEG = DE

Q19. Which of the following age groups do you fall into? Are you... **SINGLE CODE**

18 to 24
25 to 29
30 to 34
35 to 44
45 to 49
50 to 64
65 to 74
75 or over
Prefer not to say

Q20. Are you:

Male
Female
Prefer to self-identify / Other
Prefer not to say

Q21. Do you have a water meter at your home?

Yes – I/we asked to have one installed
Yes – it was already in the property when I/we moved in
Yes – I/we had to have it fitted, but I/we didn't really want it installed
No – and I/we not interested in getting one
No – but I/we are considering getting one
No – I/we had one, but decided to opt out
Don't Know

There are just a few more questions about you and your household. You do not have to answer any questions you don't want to, but it's really helpful for us to understand about you and your situation. By asking these questions we can make sure we speak to a wide range of people and ensure services meet everyone's needs.

Q22. What is your total annual household income before tax from all sources (e.g. employment, rental properties, etc.)? **IF CATI: READ OUT**

SINGLE CODE

Up to £5000	**LOW INCOME**
£5, 001 - £10,000	
£10,001-£15,000	
£15,001-£20,000	
£20,001-£30,000	
£30,001-£40,000	
£40,001-£50,000	
£50,001-£60,000	
£60,001-£70,000	
£70,001-£80,000	
More than £80,000	
Prefer not to say	

Q23. These days a lot of people are struggling to pay their household bills. Which of the following best describes how affordable you find your water bill and other household bills? **Please remember, this research is entirely confidential and that it is only by talking to people in debt, or struggling to pay their bills, that change can be influenced.**

I always pay my water bill, and other household bills, on time	
I always pay my water bill on time, but sometimes struggle, or am late, paying other bills	**STRUGGLING**
I sometimes pay my water bill late	**STRUGGLING**
I often find it difficult to pay my water bill on time	**IN DEBT**
I am rarely, or never, able to pay my water bill on time	**IN DEBT**
Prefer not to answer	

Q24. Do any of the following apply to you, or anyone in your household? **IF CATI: READ OUT** MULTI CODE

Visual impairment	**VULNERABLE CIRCUMSTANCES**
Hearing impairment	
Speech impairment	
Learning difficulty	
Developmental condition	
Living with dementia	
Mental health condition	
Difficulty understanding English	
Mobility impairment	
Serious/chronic long-term illness	
Medical equipment that is reliant on electricity	
Other illness, health problem or disability that limits your daily activities or the work you can do	
Aged 75 or over	
Recovering from hospitalisation	
New baby in the house	
Single parent with children under 5 years old	
Covid vulnerable	
None of the above	
Prefer not to say	

Q25. Have you used the Internet via a computer, tablet or smartphone in the last 3 months?

No	**DIGITALLY EXCLUDED**
Yes	
Prefer not to answer	

Q26. **(IF YES)** Which of the following best describes you?

SINGLE CODE

I feel very confident about using the internet	
I feel quite confident about using the internet	
I don't feel confident about using the internet	**DIGITALLY EXCLUDED**
I would rather not use the internet at all	**DIGITALLY EXCLUDED**
Prefer not to answer	

Q27. Which of these items do you have in your home and that are available for you to use?

Smartphone	
Tablet	
Laptop or desktop computer	
None of the above	**DIGITALLY EXCLUDED**

Thanks, we're now ready to move on

Thank you for those background details about [IF HH: you and your household / IF NHH: your organisation]. We can now move onto the main part of the questionnaire which will take about 20 minutes to complete.

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

We would like to start by asking you a few questions about your experiences of Wessex Water.

Q28. How satisfied would you say you are with the **overall service** provided by Wessex Water? When giving your answer, please think about all aspects of the service they provide.

0. Extremely dissatisfied
1.
2.
3.
4.
5. Neither satisfied nor dissatisfied
6.
7.
8.
9.
10. Extremely satisfied
11. Don't know

Q29. How much do you **trust** Wessex Water?

0. I don't trust them at all
1.
2.
3.
4.

5.
6.
7.
8.
9. I trust them completely
10. Don't know
11.

Q30. How satisfied are you with the **value for money** of the services you receive?

Very dissatisfied
Fairly dissatisfied
Neither satisfied nor dissatisfied
Fairly satisfied
Very satisfied
Don't know

Q31. [**HH**: Have you / **NHH:** has your organisation] experienced any of the following in the last 3 years? MULTICODE

Had to raise a query about your water/sewage bill
Needed to raise a customer service complaint related to drainage or wastewater
Internal sewer flooding (inside your property)
External sewer flooding (such as [HH: in your garden / NHH: directly outside your workplace] or a public place)
Seen a pollution in a river or sea due to wastewater contamination
Been ill after swimming in rivers or the sea
Smells from treatment works (Water Recycling Centres)
Traffic disruption caused by sewage works
Other (please specify) DO NOT ROTATE
I haven't experienced any of these DO NOT ROTATE

Q32. When was the last time [**HH:** you /**NHH:** your organisation] contacted Wessex Water either via telephone or any other method of contact? **Other methods could include writing a letter or email, their website live chat or speaking to someone face-to-face**. SINGLE CODE

Within the last six months
Six to twelve months ago
Between one and two years ago
Between two and three years ago
Over three years ago
Have contacted them before but can't recall how long ago
Never contacted them
Don't know

A bit about Wessex Water

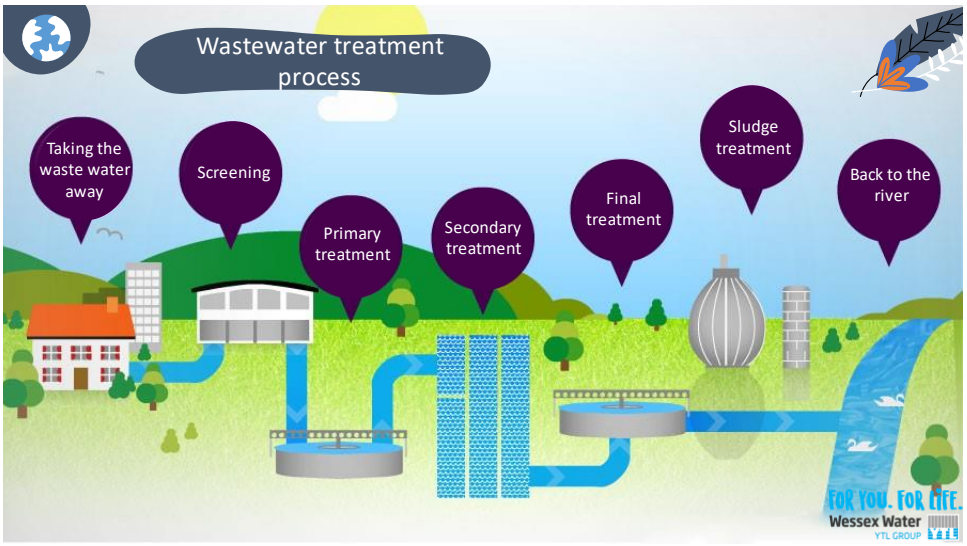
Before we ask you some more questions, we would like to tell you more about Wessex Water and the management of sewage.

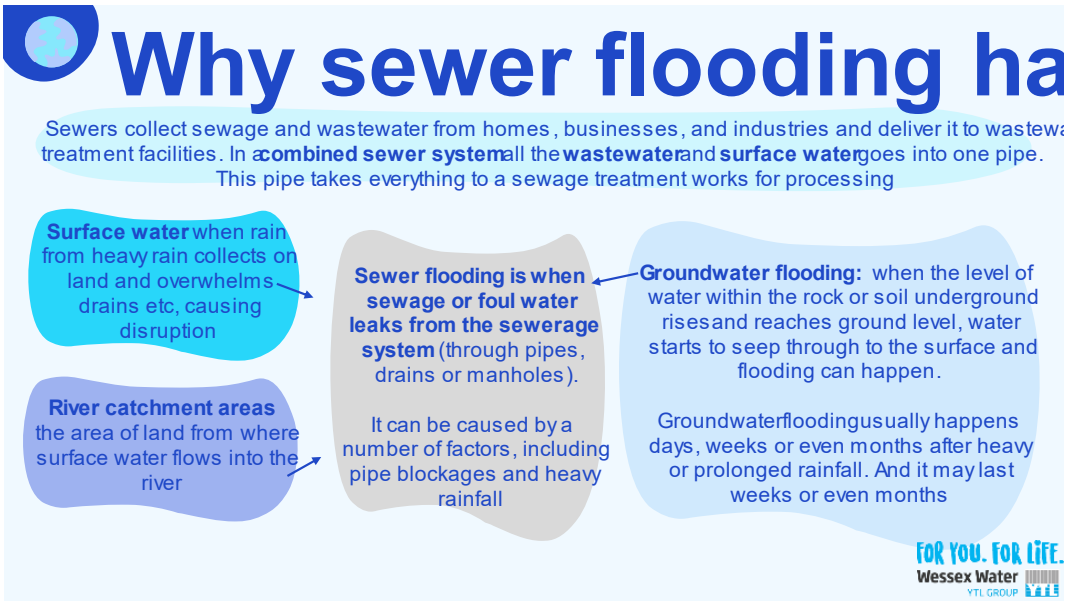
Please read carefully through the following information. Please note that you will be unable to move on until the information is read. But there is no maximum time so please don't feel you need to rush!

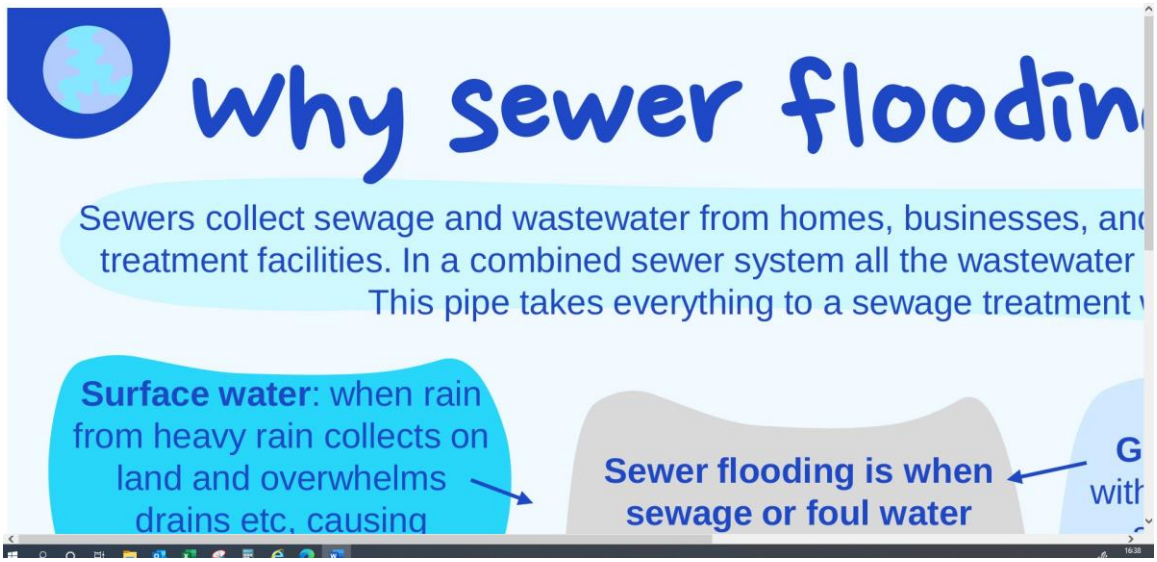
DP: UPDATED CHARTS HERE:

\\accent-mr.com\accentdata\Projects\3500_Drainage_Water_Management_Plan\Project management\Fieldwork materials\Quant\3500stim02_DWMP quant stim_v3.pptx

DP: 5 SECONDS PER SLIDE







What is a DWMP?
Wessex Water is currently creating a drainage and wastewater management plan (DWMP) which will set out the company's plan for dealing with sewage and flooding over the next 25 years. Flooding is expected to become more common and more sever due to climate change and the growth and urbanisation.

In developing their plan Wessex Water are working closely with partners, such as highways authorities, local authorities and the Environment Agency, to identify and deliver solutions for the long-term management of drainage and wastewater.

This plan, which will be published in Summer 2022, also seeks to include the views of customers, like you.

Your views on sewer flooding

We'd like to start by understanding your views on different types of sewer flooding.

The following eight questions are all about different types of sewer flooding that some customers can experience. The choices show the location, type of water and frequency of the flooding. The type of water can be just rain water, or foul /combined which is a mixture of wastewater and rain water

In each case, please choose either Option A or Option B depending on which one you feel would be **worst** for you and your household if it were to happen to you.

An example is shown below:

QSP1Q1 – QSP1Q8 Which type of flooding would you consider the **worst** for you from the options shown below?

A

B

QSP1B In the questions you have just answered, did you generally feel able to make comparisons between the options presented to you?

Yes
No

QSP1C **ONLY ASK IF QSP1B=2, ELSE SKIP:** Please explain why you weren't able to make the comparisons in the choices?

QSP1D Were any of the options shown hard to understand?

Yes
No

QSP1E **ONLY ASK IF 0=2, ELSE SKIP:** Please explain what was hard to understand.

Reducing sewer flooding

The next questions are about whether you would be willing to pay more on your [NHH] company's [HH] household's wastewater bill for a reduced number of sewer flooding incidents across the Wessex Water region, or whether you'd prefer your bill to be no higher than it is already.

Before answering these questions, please consider:

- Whether the potential change in sewer flooding described is important to you; and
- Your overall household income and expenses, remembering that:
  - The bill increase shown will only pay for reduced sewer flooding. It does not include any other improvements that could potentially be made by Wessex Water.
  - Other bills may go up or down affecting the amount of money you have to spend in general
  - Your household bills will also be affected by the rate of inflation each year.

[New screen]
In the table below:

- Option A shows your current service level and bill, which would stay as they are now.
- Option B shows the improved service level along with the new level of your bill which is higher than now. In this option, sewer flooding inside customers' properties has been eliminated altogether, and sewer flooding outside properties and in roads, fields and parks has been reduced by a quarter.

IF WASTEWATER BILL CALCULATED: Based on what you told us about your water bill, we have calculated that your annual wastewater bill is likely to be [CALCULATED AMOUNT]
IF DON'T KNOW FOR WASTEWATER BILL: For the purposes of these exercises we would like you to assume that your annual wastewater bill is likely to be £223 which is the average for most households.

[INSERT SP5Q1 CHOICE]

SP5Q1 If these were the only two options, which option would you prefer for your wastewater service?

Option A (Same as now)
Option B (Reduced flooding)

[New screen]

SP5Q1WHY: Why did you choose this option? [RECORD VERBATIM]

[If SP5Q1 = A, show SP5Q2A]
[If SP5Q1 = B, show SP5Q2B]

SP5Q2A If the cost of Option B was a #SP5HalfBCost# increase would you still choose Option A or would you now choose Option B?

Option A (Same as now)
Option B (Reduced flooding)

SP4Q2B If the cost of Option B was a # SP4DoubleBCost # increase would you still choose Option B or would you now choose Option A?

Option A (Same as now)
Option B (Reduced flooding)

Timing of investment

In this next question, you still have the option of choosing for your bill payments and the wastewater service you receive to stay as they are currently, but there are now three different options for how quickly improvements to wastewater service levels would be made. The quicker the improvements, the more steeply that bills would need to increase.

The improvements relate to a reduction in the amount of foul/combined sewer flooding incidences per year in the Wessex Water region.

The answer you give to this question will help determine when, if at all, the improvements to wastewater services are made by Wessex Water and, accordingly, whether and how quickly bills are increased to pay for them.
[New screen]

[INSERT SP6Q1 CHOICE CARD]

SP6Q1 Of these four options, which option would you prefer for your wastewater service?

Option A (Same as now)
Option B (Invest by 2030)
Option C (Invest by 2035)
Option D (Invest by 2050)

[New screen]

SP6Q1WHY: Why did you choose this option? [RECORD VERBATIM]

Finally, a bit more about [**HH**: you / **NHH:** your organisation]

DP FOR FUTURE FOCUS PANEL ADD:. The results from these questions will help with our analysis. Your responses will be completely confidential and not attributed to you personally, however, you may skip any question you do not feel comfortable answering

~~Q50.~~

Q51. **HH ONLY:** To which of these ethnic groups do you consider you belong to?

WHITE
1. British
2. Irish
3. Any other White background

MIXED
4. White and Black Caribbean
5. White and Black African
6. White and Asian
7. Any other Mixed background

ASIAN OR ASIAN BRITISH
8. Indian
9. Pakistani
10. Bangladeshi
11. Any other Asian background

BLACK OR BLACK BRITISH
12. Caribbean
13. African
14. Any other Black background

CHINESE OR OTHER ETHNIC GROUP
15. Chinese
16. Any other ethnic group

17. Prefer not to say **CAPI: DO NOT READ OUT**

Q52. Thinking about all the people who live with you at your home, how many people, including yourself, fall into the following age groups: SINGLE CODE **ONLINE:** For each age group, please select the option that applies to you. If there are no people in your household belonging to a certain age group, please select 'zero' for it.

Up to 5 years	0	1	2	3	4	5+
5 to 15 years	0	1	2	3	4	5+
16 to 65 years	0	1	2	3	4	5+
Over 65 years	0	1	2	3	4	5+

Prefer not to say **CATI: DO NOT READ OUT**

Q53. What type of property do you live in? SINGLE CODE

Flat
Terraced house
Semi-detached house
Detached house
Bungalow
Maisonette

Q53a. Do you receive any of the following social security payments? **MULTICODE**
CATI/CAPI: READ OUT

CAPI/CATI: INTERVIEWER: If they say they don't receive any benefits before you finish reading out the list, stop reading and code as "None of these"
Attendance Allowance
Carer's Allowance
Child Tax Credit
Council Tax Benefit
Disability Living Allowance
Housing Benefit
Income Support (or similar such as Employment and Support allowance)
Jobseeker's Allowance
Pension Credit
Universal Credit
Working tax credit
None of these **NOT WITH ANY OTHER CODE**
Prefer not to say **NOT WITH ANY OTHER CODE** **CAPI/CATI:DO NOT READ OUT**

~~Q54.~~

~~Q55.~~

Q56. Are you on WaterSure, a Wessex Water Restart scheme, a Wessex Water low rate tariff or another special tariff from your water company that helps towards the cost of your water bill?

SINGLE CODE
No
Watersure
Wessex Water Restart scheme
Wessex Water low rate tariff
Another special tariff
Don't know
Prefer not to say

Q57. **ASK NHH ONLY:** And now thinking about the organisation you work for.

How many employees does your organisation have in the UK?

Less than 10
11-100
101-249
250-499
500-999
1,000 or more

Q58. **ASK NHH ONLY:** And what business sector best defines the core activity of your company?

	Agriculture, Forestry and Fishing (code A)
	Mining and Quarrying (code B)
	Manufacturing (code C)
	Energy or water service & supply (Codes D, E)
	Construction (code F)
	Wholesale and retail trade (incl. motor vehicles repair but not hairdressing) (CODE G)
	Transport and storage (code H) (Freight, taxis, airlines, bus, rail and warehousing, post offices)
	Hotels & catering, accommodation and food service activities (Code I)(pubs, restaurants)
	IT and Communication (code J) (Computer, media, publishing, software, IT consultancies)
	Finance and insurance activities (code K) (banking, insurance) and real estate activities (code L) (selling/renting properties/conveyancing/property law)
	Business services : Professional, scientific and technical activities (code M) (architecture, accountancy, consulting, engineering, PR, advertising, veterinary, legal of anything except property law,) and Admin and support services (code N) (cleaning, gardening, employment agencies, office services, leasing and renting of anything but properties)
	Government (code O), education (code P) (schools, universities) and health (hospitals, doctors) and social work (code Q), charities)
	Arts, entertainment and recreation (code R) (Libraries, theatres, museums, zoos, sport centres, fitness)
	Other service activities (code S) (Trade Unions, Churches, Repair services, Funeral-related services, Hairdressers)

Q59. **ASK NHH ONLY:** How much do you agree or disagree that on a day-to-day basis, your organisation depends on its water supply and sewage services (e.g., removal and treatment of used/wastewater) in order to operate?

Strongly agree.
Agree
Neither agree nor disagree
Disagree
Strongly disagree.

~~Q60.~~

Q61. **CAPI and NHH ONLY**: Thank you. Would you be willing to be contacted again if we need to clarify any of the answers you have given today? And would you be willing to be invited to take part in other research for Wessex Water?

Yes, for both clarification and further research
Yes, for clarification only
Yes, for further research only
No

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

CATI/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 0800 975 9596.

CAPI: 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?

Name: [CATI: DP, IMPORT FROM ID]

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

Q6	SYSTEM INFORMATION
Q7	Time interview completed:

INTERNAL USE ONLY: Click here
Online only ☐
CATI only ☐ (DP: add QAX)
CAPI/Tablet ☐ (BCQs:) QAZ2 Paper showcard? Y ☐ ☐
N
CATI recruit for online/field ☐ (BCQs:) QAZ3
Field recruit for online/CATI ☐ (BCQs:) QAZ1
Recruit only (ie for qual) ☐

Grid style for mobiles: click here for example
GM 1 ☐ to force mobiles to show grid (for small grids)
GAR 1 ☐ to show vertical text for answer headings
GAR 2 ☐ to show vertical text for answer headings on mobile devices only

Questionnaire Style (default is 7): Click here for details

Choose base format:	Choose variations:
Accis3 ☐	Question and answer fonts (full list: https://fonts.google.com/)
Accis4 ☐	Header font ☐
Accis5 ☐	Tick box style (1-6) ☐
Accis6 ☐	Next/previous button style (1-3) ☐
Accis7 ☐	Font colour (use HEX code http://html-color-codes.i☐/#HTML_Color_Picker)
Accis8	

Other colours: Note that CLR1 and CLR6 change a number of different elements (to easily keep the colours consistent)

CLR1 # ☐ Progress bar border, progress colour, button colour
CLR2 # ☐ Progress bar background colour
CLR3 # ☐ Page background colour
CLR4 # ☐ Header background colour (if different from CLR1)
CLR5 # ☐ Header font colour
CLR6 # ☐ Border colour for selected checkbox and checkbox border colour when hovered over (if differ# ☐ CLR1)
CLR7 # ☐ Background colour for selected checkbox (if different from CLR1)
CLR8 Tick/circle colour for selected checkbox

Q8	SYSTEM INFORMATION:
Q9	DELETE IF ONLINE Interviewer number:
Q10	DELETE IF ONLINE Interviewer name:
Q11	Date:
Q12	Time interview started:

FOR YOU. FOR LIFE.
Wessex Water
YTL GROUP

FACE TO FACE: HOUSEHOLD

Good morning/afternoon/evening. My name is ..... from Accent and I am carrying out research for Wessex Water – they are keen to hear the views of a variety of customers to help inform their future plans for drainage and wastewater management.

Wessex Water treats millions of litres of wastewater every day. This is water that has entered the sewerage network from homes and businesses after it has been used for showering, flushing the toilet, commercial activities, industrial processes and, in most areas, rainwater and runoff is also drained into the sewer system.

Their future plan will look 25 years to the future and so considers the challenges of urban growth and climate change, a range of investment options and their impacts on customer bills. Hearing customer views is an important step in developing the plan.

The research is being conducted under the Market Research Society Code of Conduct, which means that any answers you give will be treated in confidence.

The survey will take around 22 minutes to complete. We appreciate the time you'll spend giving your feedback for Wessex Water. As a thank you we'd like to provide you with a £5 voucher.

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

ONLINE

Thank you very much for agreeing to **complete** this on-line survey which is being conducted by Accent, on behalf of Wessex Water. The closing date for completion of this survey is 8 October 2021.

Wessex Water are keen to hear the views of a variety of customers and stakeholders to help inform their future plans for drainage and wastewater management.

Wessex Water treats millions of litres of wastewater every day. This is water that has entered the sewerage network from homes and businesses after it has been used for showering, flushing the toilet, commercial activities, industrial processes and, in most areas, rainwater and runoff is also drained into the sewer system.

Wessex Water are currently developing a Drainage and Wastewater Management Plan which looks 25 years to the future and so considers the challenges of urban growth and climate change, a range of investment options and their impacts on customer bills. Hearing customer views is an important step in developing the plan.

The survey will take around 22 minutes to complete and we will just ask you a few initial 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. If you would like to confirm Accent's credentials type Accent in the search box at: https://www.mrs.org.uk/researchbuyersguide.

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.

Looking after your data

Q1. **ASK ALL:** Any data collected over the course of this interview that could be used to identify you will be held securely and will not be shared with any third party (including Wessex Water) unless you give permission (or unless we are legally required to do so). Our privacy statement is available at https://www.accent-mr.com/privacy-policy/.

Do you agree to proceeding with the interview on this basis?

Yes
No **THANK AND CLOSE DP NOTE THANK AND CLOSE MESSAGE FOR HOUSEHOLD AND EMPLOYEES SHOULD READ: "THANK YOU FOR TAKING THE TIME TO ANSWER THOSE QUESTIONS. WE'RE SORRY BUT ON THIS OCCASION WE ARE LOOKING FOR OTHER TYPES OF CUSTOMERS. HOWEVER, IS THERE ANYTHING YOU WOULD LIKE TO TELL US ABOUT WESSEX WATER BEFORE WE CLOSE THE SURVEY?"**

DP – GENERAL 'THANK AND CLOSE' TEXT UNLESS OTHERWISE SPECIFIED: **THANK YOU FOR TAKING THE TIME TO ANSWER THOSE QUESTIONS. WE'RE SORRY BUT ON THIS OCCASION WE ARE LOOKING FOR OTHER TYPES OF CUSTOMERS.**

About you

Q2. **ASK CAPI ONLY. OTHERS GO TO Q6:** In line with government guidelines we have a few questions to check your Covid-19 status. Are you or anyone you have been in close contact with currently experiencing any flu-like symptoms or other Covid-19 symptoms?

INTERVIEWER NOTE: THIS WOULD INCLUDE HIGH TEMPERATURE AND/OR LOSS OF SENSE OF TASTE OR SMELL

Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q3. Have you or anyone you have been in close contact with been diagnosed with Covid-19 within the past two weeks, and not subsequently tested negative

Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q4. Are you someone who is defined as either Clinically Extremely Vulnerable or Clinically Vulnerable?

INTERVIEWER NOTE: THEY WILL HAVE BEEN INFORMED OF THIS STATUS EARLY ON IN LOCKDOWN
Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q5. Are you currently shielding to protect yourself from Covid-19 or caring for someone else who is especially vulnerable to Covid-19?

Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q6. **ASK ALL:** Are you currently in paid employment? (including being self-employed)

Yes
No **ONLINE / CAPI GO TO 10a**

Q7. **ASK IF Q6= 1**: How much involvement, if any, do you have in managing the water bills for the organisation you work for?

I solely or jointly manage the bills **GO TO Q8**
I don't have any involvement in the bills **GO TO 10a**

Q8. Are you a sole trader working from home and with no separate business premises?

I am a sole trader and have no separate business premises **GO TO 10a**
I work in a separate business premises **GO TO Q9**

HH = CODE 2 AT Q6 OR CODE 2 Q7 OR CODE 1 AT Q8
NHH = CODE 2 AT Q8

Q9. **ASK NHH ONLY:** How many sites does your organisation have in the UK?

One site
More than one site
Don't know

Q10. **ASK IF Q9 = 1** Is this site **ASK IF Q9=2-3** Are any of these sites in any of the areas shaded green in the map below? NOTE TO INTERVIEWER - Can be either light or dark green

Yes **CODE AS NHH**
No **CODE AS HH, SHOW TEXT BELOW AND THEN GO TO Q10a**
Don't know **CODE AS HH, SHOW TEXT BELOW AND THEN GO TO 10a**

IF CODES 2 OR 3 We would like you to respond to this survey as a household customer of Wessex Water

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Q10a. **ASK HH ONLY (EXCLUDING CUSTOMER SAMPLE)**: What's the first half of your postcode? We will only use this to check who provides your water**.**

DP ADD TEXT BOX
Prefer not to answer **THANK & CLOSE**

DP – CHECK AGAINST THE FOLLOWING SPREADSHEET. WE NEED A MINIMUM OF 20% COMPLETES FROM EACH REGION \\accent-mr.com\accentdata\Projects\3500 Drainage Water Management Plan\Project management\Information from client\Postcodes to Level 2 and 3.xlsx

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Q11. **ASK HH ONLY:** Are you the person, or one of the people, in your household who pays the water bills at home? **SINGLE CODE**

I have complete responsibility for payment
I share responsibility for payment with others in my household
I have no responsibility, but I know it is paid by my landlord and included in my rent
I have no responsibility for payment and I don't know who pays the bills
Other - please tell us what
Don't know **THANK & CLOSE**

Q12. **ASK HH ONLY:** Do you or any of your close family work in market research or for a water company (including working for Wessex Water)? **SINGLE CODE**

Yes **THANK & CLOSE**
No

Q13. **ASK HH ONLY**: Who supplies clean water services (i.e. the water that comes out of your taps) to your home?

ASK NHH: Which company provides your organisation with clean water?

Wessex Water
Bristol Water

Bournemouth Water
Other **THANK & CLOSE**
DP NOTE THANK AND CLOSE MESSAGE FOR HOUSEHOLD AND EMPLOYEES SHOULD READ: "THANK YOU FOR TAKING THE TIME TO ANSWER THOSE QUESTIONS. WE'RE SORRY BUT ON THIS OCCASION WE ARE LOOKING FOR OTHER TYPES OF CUSTOMERS. HOWEVER, IS THERE ANYTHING YOU WOULD LIKE TO TELL US ABOUT WESSEX WATER BEFORE WE CLOSE THE SURVEY?"

DP – GENERAL 'THANK AND CLOSE' TEXT UNLESS OTHERWISE SPECIFIED: **THANK YOU FOR TAKING THE TIME TO ANSWER THOSE QUESTIONS. WE'RE SORRY BUT ON THIS OCCASION WE ARE LOOKING FOR OTHER TYPES OF CUSTOMERS.**

HH QUOTAS:
350 Wessex
175 Bournemouth Water
175 Bristol Water

Q14. Who provides wastewater (sewerage) services for your [if HH] home [if NHH] organisation?

Wessex Water
Other **THANK & CLOSE**

ASK ALL: QBILL1 IF WESSEX OR BRISTOL AT Q13 ASK: How much is your water bill? NHH: How much is your organisation's water bill? **You can provide the amount either weekly, monthly, quarterly, half yearly or annually. ONLINE**: **Simply pick the time period from the drop down box**

Weekly: £
Monthly: £
Quarterly: £
Half yearly: £
Annual: £80
Don't know **CATI: DO NOT READ OUT**

DP CALCULATE ANNUAL BILL AND THEN CALCULATE SEWAGE AS 49% OF ANNUAL AMOUNT. FOR 'DON'T KNOW' USE £223

QBILL2 IF BOURNEMOUTH AT Q13 ASK: You should get a separate bill from Wessex Water for your sewerage services. How much is your sewerage bill? NHH: How much is your organisation's sewerage bill? **You can provide the amount either weekly, monthly, quarterly, half yearly or annually. ONLINE**: **Simply pick the time period from the drop down box**

Weekly: £
Monthly: £
Quarterly: £
Half yearly: £
Annual: £
Don't know **CATI: DO NOT READ OUT**

DP CALCULATE ANNUAL WASTEWATER AMOUNT. FOR 'DON'T KNOW' USE £223

QBILL3 ASK IF QBILL1 AND QBILL2 NOT EQ 'DON'T KNOW' ELSE GO TO Q15. Is that the exact amount or an estimate?

Exact amount
Estimate

NHH GO TO MAIN QUESTIONNAIRE

Q15. **ASK HH ONLY:** Which ONE of the following best describes the occupation of the main income earner in your household? **If you or the main income earner are self-employed please tick the option that most relates to the type of work you/they do for the company(s) you/they work for.**

Higher managerial/ professional/ administrative (e.g. Doctor, Solicitor, Board Director in a large organisation 200+ employees, top level civil servant/public service employee etc.)
Intermediate managerial/ professional/ administrative (e.g. Newly qualified (under 3 years) doctor, Solicitor, Board director of small organisation, middle manager in large organisation, principal officer in civil service/local government etc.)
Supervisor; clerical; junior managerial administrative or professional (e.g. Office worker, Student Doctor, Foreman with 25+ employees, salesperson, etc.)
Skilled manual worker (e.g. Bricklayer, Carpenter, Plumber, Painter, Bus Driver, paramedic, HGV driver, pub/bar worker etc.)
Semi or unskilled manual worker (e.g. Caretaker, Park keeper, non-HGV driver, shop assistant etc.)
Student
Unemployed or not working due to long-term sickness
Casual worker – not in permanent employment
Full-time carer of other household member
Retired **GO TO Q16**
Rather not say **THANK AND CLOSE**

Q16. **IF Q15=10 (RETIRED). OTHERS GO TO Q18**: Does the main income earner have a state pension, an occupational or private pension or both?

State only
Occupational or Private only
Both

Q17. **IF Q16 = PRIVATE OR BOTH. OTHERS GO TO Q18:** How would you describe the main income earner's occupation immediately before retirement?

Higher managerial/ professional/ administrative (e.g. Doctor, Solicitor, Board Director in a large organisation 200+ employees, top level civil servant/public service employee etc.)
Intermediate managerial/ professional/ administrative (e.g. Newly qualified (under 3 years) doctor, Solicitor, Board director of small organisation, middle manager in large organisation, principal officer in civil service/local government etc.)
Supervisor; clerical; junior managerial administrative or professional (e.g. Office worker, Student Doctor, Foreman with 25+ employees, salesperson, etc.)
Skilled manual worker (e.g. Bricklayer, Carpenter, Plumber, Painter, Bus Driver, paramedic, HGV driver, pub/bar worker etc.)
Semi or unskilled manual worker (e.g. Caretaker, Park keeper, non-HGV driver, shop assistant etc.)
Student
Unemployed or not working due to long-term sickness
Casual worker – not in permanent employment
Full-time carer of other household member
None of these

Q18. **SEG: CODE AS FOLLOWS**:

IF **Q15**= 1 or 2; SEG = AB
IF **Q15**= 3; SEG = C1
IF **Q15**= 4; SEG = C2

IF **Q15**= 5-9; SEG = DE

IF **Q15**= 10 and **Q16**= State only; SEG = DE

IF **Q15**= 10 and Q16 = Private only OR Both and Q17 = 1 or 2; SEG = AB
IF **Q15**= 10 and Q16 = Private only OR Both and Q17 = 3; SEG = C1
IF **Q15**= 10 and Q16 = Private only OR Both and Q17 = 4; SEG = C2
IF **Q15**= 10 and Q16 = Private only OR Both and Q17 = 5, 6, 7, 8, 9; SEG = DE

Q19. Which of the following age groups do you fall into? Are you... **SINGLE CODE**

18 to 24
25 to 29
30 to 34
35 to 44
45 to 49
50 to 64
65 to 74
75 or over
Prefer not to say

Q20. Are you:

Male
Female
Prefer to self-identify / Other
Prefer not to say

Q21. Do you have a water meter at your home?

Yes – I/we asked to have one installed
Yes – it was already in the property when I/we moved in
Yes – I/we had to have it fitted, but I/we didn't really want it installed
No – and I/we not interested in getting one
No – but I/we are considering getting one
No – I/we had one, but decided to opt out
Don't Know

There are just a few more questions about you and your household. You do not have to answer any questions you don't want to, but it's really helpful for us to understand about you and your situation. By asking these questions we can make sure we speak to a wide range of people and ensure services meet everyone's needs.

Q22. What is your total annual household income before tax from all sources (e.g. employment, rental properties, etc.)? **IF CATI: READ OUT**

SINGLE CODE

Up to £5000	**LOW INCOME**
£5, 001 - £10,000	
£10,001-£15,000	
£15,001-£20,000	
£20,001-£30,000	
£30,001-£40,000	
£40,001-£50,000	
£50,001-£60,000	
£60,001-£70,000	
£70,001-£80,000	
More than £80,000	

Prefer not to say	

Q23. These days a lot of people are struggling to pay their household bills. Which of the following best describes how affordable you find your water bill and other household bills? **Please remember, this research is entirely confidential and that it is only by talking to people in debt, or struggling to pay their bills, that change can be influenced.**

I always pay my water bill, and other household bills, on time	
I always pay my water bill on time, but sometimes struggle, or am late, paying other bills	**STRUGGLING**
I sometimes pay my water bill late	**STRUGGLING**
I often find it difficult to pay my water bill on time	**IN DEBT**
I am rarely, or never, able to pay my water bill on time	**IN DEBT**
Prefer not to answer	

Q24. Do any of the following apply to you, or anyone in your household? **IF CATI: READ OUT** MULTI CODE

Visual impairment	**VULNERABLE CIRCUMSTANCES**
Hearing impairment	
Speech impairment	
Learning difficulty	
Developmental condition	
Living with dementia	
Mental health condition	
Difficulty understanding English	
Mobility impairment	
Serious/chronic long-term illness	
Medical equipment that is reliant on electricity	
Other illness, health problem or disability that limits your daily activities or the work you can do	
Aged 75 or over	
Recovering from hospitalisation	
New baby in the house	
Single parent with children under 5 years old	
Covid vulnerable	
None of the above	
Prefer not to say	

Q25. **CAPI ONLY:**Have you used the Internet via a computer, tablet or smartphone in the last 3 months?

No	**DIGITALLY EXCLUDED**
Yes	
Prefer not to answer	

Q26. **CAPI ONLY: (IF YES)** Which of the following best describes you?

SINGLE CODE

I feel very confident about using the internet	
I feel quite confident about using the internet	
I don't feel confident about using the internet	**DIGITALLY EXCLUDED**
I would rather not use the internet at all	**DIGITALLY EXCLUDED**
Prefer not to answer	

Q27. Which of these items do you have in your home and that are available for you to use?

Smartphone	
Tablet	
Laptop or desktop computer	
None of the above	**DIGITALLY EXCLUDED**

Thanks, we're now ready to move on

Thank you for those background details about [IF HH: you and your household / IF NHH: your organisation]. We can now move onto the main part of the questionnaire which will take about 20 minutes to complete.

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

We would like to start by asking you a few questions about your experiences of Wessex Water.

Q28. How satisfied would you say you are with the **overall service** provided by Wessex Water? When giving your answer, please think about all aspects of the service they provide.

12. Extremely dissatisfied
13.
14.
15.
16.
17. Neither satisfied nor dissatisfied
18.
19.
20.
21.
22. Extremely satisfied
23. Don't know

Q29. How much do you **trust** Wessex Water?

12. I don't trust them at all
13.
14.
15.
16.
17.
18.
19.
20.
21. I trust them completely
22. Don't know
23.

Q30. How satisfied are you with the **value for money** of the services you receive?

Very dissatisfied
Fairly dissatisfied
Neither satisfied nor dissatisfied

Fairly satisfied
Very satisfied
Don't know

Q31. [**HH**: Have you / **NHH:** has your organisation] experienced any of the following in the last 3 years? MULTICODE

Had to raise a query about your water/sewage bill
Needed to raise a customer service complaint related to drainage or wastewater
Internal sewer flooding (inside your property)
External sewer flooding (such as [HH: in your garden / NHH: directly outside your workplace] or a public place)
Seen pollution in a river or sea due to wastewater contamination
Been ill after swimming in rivers or the sea
Smells from treatment works (Water Recycling Centres)
Traffic disruption caused by sewage works
Other (please specify) DO NOT ROTATE
I haven't experienced any of these DO NOT ROTATE

Q32. When was the last time [**HH:** you /**NHH:** your organisation] contacted Wessex Water either via telephone or any other method of contact? **Other methods could include writing a letter or email, their website live chat or speaking to someone face-to-face**. SINGLE CODE

Within the last six months
Six to twelve months ago
Between one and two years ago
Between two and three years ago
Over three years ago
Have contacted them before but can't recall how long ago
Never contacted them
Don't know

A bit about Wessex Water

Before we ask you some more questions, we would like to tell you more about Wessex Water and the management of sewage.

Please read carefully through the following information. Please note that you will be unable to move on until the information is read. But there is no maximum time so please don't feel you need to rush!

DP: PLEASE USE THE 4 UPDATED CHARTS SSAVED HERE:

\\accent-mr.com\accentdata\Projects\3500_Drainage_Water_Management_Plan\Project management\Fieldwork materials\Quant\3500stim02_DWMP quant stim_v3.pptx
DP: 5 SECONDS PER SLIDE

Facts about Wessex Water

Wessex Water treats & supplies 280 million litres of water a day

It removes & treats 960 million litres of wastewater a day

It looks after 7,200 miles of water mains and 22,000 miles of sewer pipes

Wessex Water gets the highest customer service scores in the industry according to the regulator (Ofwat)

It employs 2,200 people in the region

The Environment Agency assess Wessex Water to be a "leading" water company for environmental performance

FOR YOU. FOR LIFE.
Wessex Water
YTL GROUP

About wastewater .....

Our everyday habits at home and work create wastewater that enters the sewer system every time you flush the toilet, have a shower and do the washing up. This wastewater can also be called **foul water.**

In most areas this household wastewater combines with rainwater and runoff from roads, roofs and gardens as well as industrial effluent – mainly liquid organic waste from industries such as food factories and dairy product manufacturers.

Wessex Water treats 960 million litres of wastewater every day.

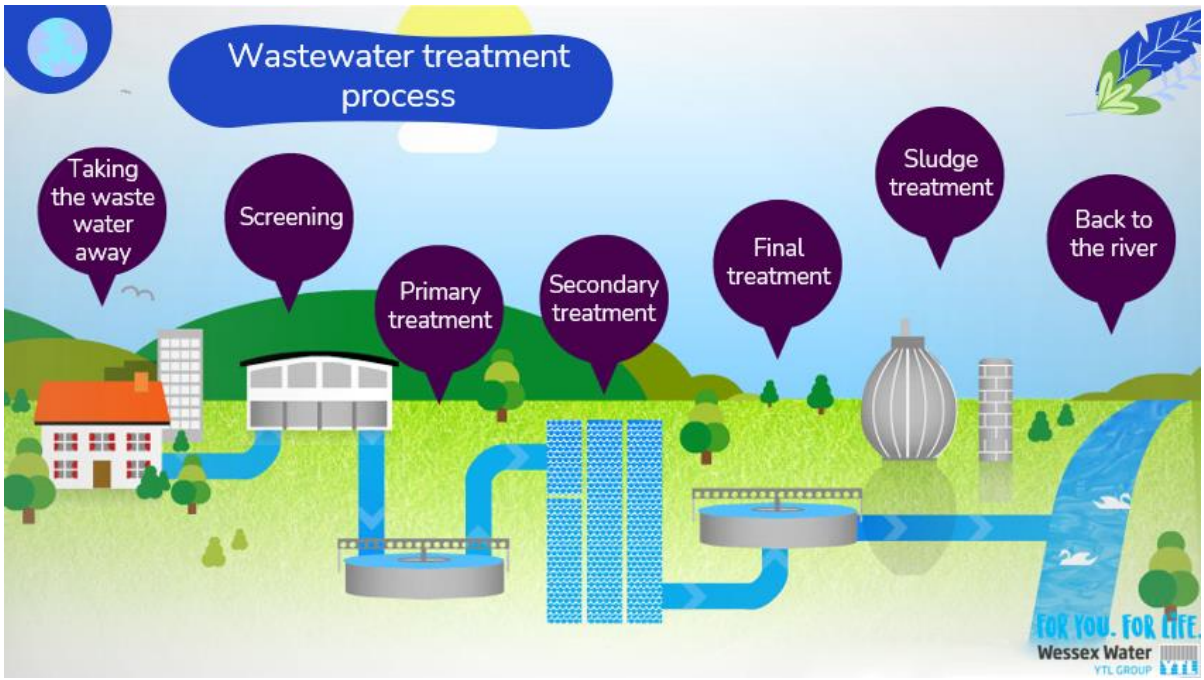
Wastewater goes through the following processes:

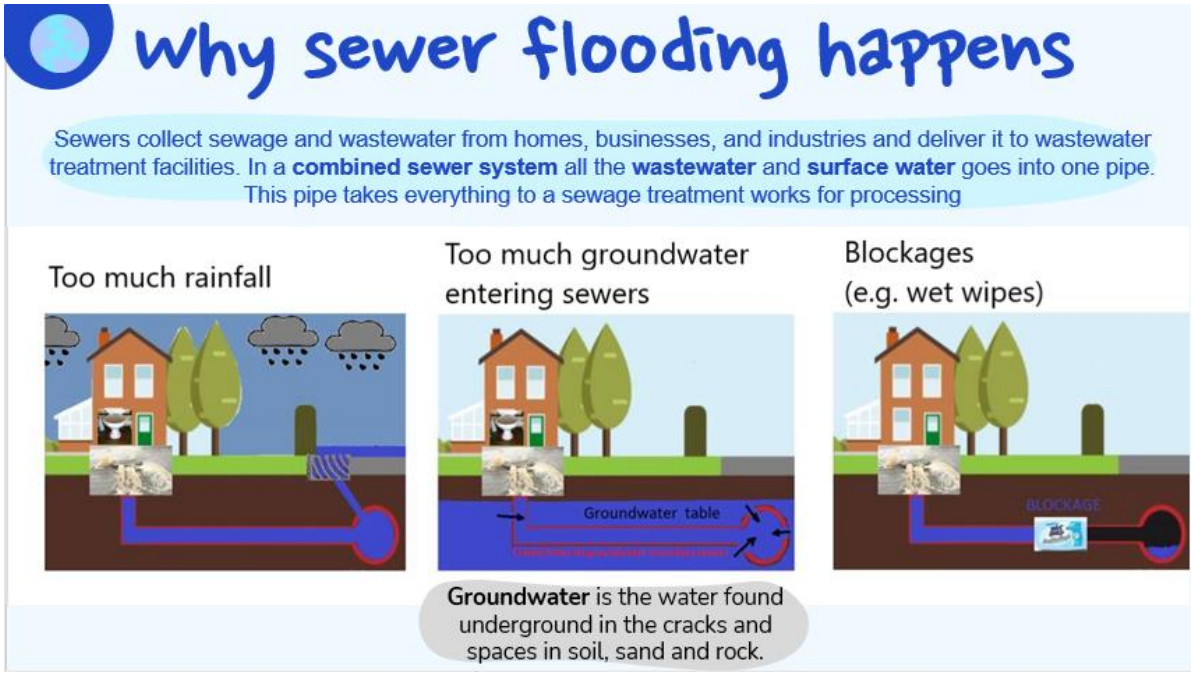
debris, rags and large objects, are removed using screens → sewage flows into tanks where the solids sink to the bottom and are removed as sludge → the sewage is treated biologically - the liquid passes through media with bacteria growing on them, such as filters of stone or plastic. The bacteria feeds off the waste, helping to clean the water

Another form of biological treatment used is the **activated sludge process**. Bacteria are mixed with the waste in large tanks using equipment which either blows or beats air into the mixture.

Foul water is waste water from the kitchens, bathrooms etc of buildings.

FOR YOU. FOR LIFE.
Wessex Water
YTL GROUP





What is a DWMP?

Wessex Water is currently creating a drainage and wastewater management plan (DWMP) which will set out the company's plan for dealing with sewage and flooding over the next 25 years. Flooding is expected to become more common and more severe due to climate change, growth and urbanisation.

In developing their plan Wessex Water are working closely with partners, such as highways authorities, local authorities and the Environment Agency, to identify and deliver solutions for the long-term management of drainage and wastewater.

This plan, which will be published in Summer 2022, also seeks to include the views of customers, like you.

Measuring Preferences over Generic Options

These next questions are to help us understand which options you think are acceptable and which are not acceptable with regards to wastewater management.

The following eight questions show two different options with differing levels of service which might be provided in relation to:

- Sewer flooding incidents (ranging from an increase of 25% in flooding incidents to a decrease of 25%)
- Carbon emissions (ranging from an increase in emissions equivalent to 100 households to a decrease in emissions equivalent to 60 households)
- Impact on rivers (ranging from no change to an improvement to fit-for-swimming quality)
- Local disruption (ranging from no additional disruption to increased congestion for 24 months)
- Cost (ranging from a 40% increase to a 10% decrease)

In each case, please choose either Option A or Option B depending on which you prefer taking into account all the information for each option.

IF WASTEWATER BILL CALCULATED: Based on what you told us about your water bill, we have calculated that your annual wastewater bill is likely to be [CALCULATED AMOUNT]
IF DON'T KNOW FOR WASTEWATER BILL: For the purposes of these exercises we would like you to assume that your annual wastewater bill is likely to be £223 which is the average for most households.

QSP2Q1 – QSP2Q8 Which option would you prefer for your wastewater service?

A
B

QSP1B In the questions you have just answered, did you generally feel able to make comparisons between the options presented to you?

Yes
No

QSP1C **ONLY ASK IF QSP1B=2, ELSE SKIP:** Please explain why you weren't able to make the comparisons in the choices?

QSP1D Were any of the levels shown hard to understand?

Yes
No

QSP1E **ONLY ASK IF 0=2, ELSE SKIP:** Please explain what was hard to understand.

SP3: Acceptability of Generic Options

These next questions are to help us understand which options you think are acceptable and which are not acceptable with regards to wastewater management.

[New screen]
In the questions below you will see a range of different options, each of which has been given a score of between 1 and 5 depending on the impact it would have across each of the following features:

- Sewer flooding incidents
- Carbon emissions
- Impact on rivers
- Local disruption
- Cost

A score of 1 is the lowest and means that there would be no change to sewer flooding incidents, carbon emissions would be high, there would be little benefit for rivers, there would be significant local disruption and the option would be expensive. But a score of 5 means a significant reduction in flooding incidents, low carbon emissions and so on.

The different options have a range of scores; they may be better on one aspect but worse on another.
The different options have a range of scores; they may be better on one aspect but worse on another.

SP3Q1. Please look at the following diagram which shows two different options for Wastewater Treatment Works:

- **Increase treatment capacity** – this means increasing the efficient use of the existing Wastewater Treatment Works or investing in new Treatment works to provide additional capacity without increasing the overall size (footprint) of the existing site
- Catchment initiatives and permitting:
  - review the permit with the Environment Agency and meet new permit conditions ⓘ
  - Treating non-domestic wastewater before it enters the sewer system

For each of the five headings in the diagram there is a ⓘ which you can click to see a key to the scores. Please assume that 2 (orange) is half way between 1 and 3 and that 4 is half way between 3 and 5.

Wastewater Treatment Works

1-5 Score (5= good)	Sewer flooding incidents ⓘ	Carbon emissions ⓘ	Impact on rivers ⓘ	Local disruption ⓘ	Cost ⓘ
Increase treatment capacity	1	1	5	4	1

Catchment initiatives and permitting	1	4	2	3	4

ⓘ Environmental permits are required for any organisation that has a need to discharge liquid effluent or waste water into the natural environment – for example:
• into surface waters, such as rivers, streams, estuaries, lakes, canals or coastal waters – known as 'water discharge activities'
• into or on the ground, such as spreading waste sheep dip, or discharging treated sewage effluent to the ground through an infiltration system – known as 'groundwater activities'
The Environment Agency is responsible for issuing these permits and updates conditions as environmental conditions evolve.

THE CONTENT FOR THE FIVE ⓘ BUTTONS IN THE HEADINGS: images for each saved in ../../Images%20and%20Graphics/

Sewer flooding incidents

1	2	3	4	5
No change		Reduction in flooding but not as much other options		Significant reduction in flooding incidents

Carbon emissions

1	2	3	4	5
High emissions		Medium emissions		Low emissions

Impact on rivers

1	2	3	4	5
Little benefit		Improvement but not as much as other options		Substantial improvement in water quality

Local disruption

1	2	3	4	5
Significant disruption		Some local disruption		No disruption

Cost

1	2	3	4	5

Expensive	Affordable but may not be possible everywhere	Cheap, but may not work

SP3Q1A Are either of these options **unacceptable** to you?

	Unacceptable	Neither	Acceptable
Increase treatment capacity	O	O	O
Catchment initiatives and permitting	O	O	O

SP3Q1B **ASK IF UNACCEPTABLE AT SP3Q1AR1: Why** do you say that increasing treatment capacity is unacceptable?

SP3Q1C **ASK IF UNACCEPTABLE AT SP3Q1AR2**: Why do you say that catchment initiatives and permitting is unacceptable?

SP3Q1D: Are either of these options particularly appealing to you?

	Appealing	Neither	Unappealing
Increase treatment capacity	O	O	O
Catchment initiatives and permitting	O	O	O

SP3Q1E **ASK IF APPEALING AT SP3Q1DR1:** Why do you say that increasing treatment capacity is appealing?

SP3Q1F **ASK IF APPEALING AT SP3Q1ADR2:** Why do you say that catchment initiatives and permitting is appealing?

SP3Q2. Please look at the following diagram which shows two different options for Customer Side Management:

- **Customer education (wet wipes blockages, misuse, lifting covers)** – this means the roll out of an education programme to improve understanding of the importance of reduced flows and misuse of the system and the impact this has on the environment and sewerage system
- **Separation – sustainably preventing rainfall entering sewers by using Sustainable drainage systems (SuDS).** These provide an alternative to the direct channelling of surface water through networks of pipes and sewers to nearby watercourses.

For each of the five headings in the diagram there is a ⓘ which you can click to see a key to the scores. Please assume that 2 (orange) is half way between 1 and 3 and that 4 is half way between 3 and 5.

Customer Side Management

1-5 Score (5= good)	Sewer flooding incidents ⓘ	Carbon emissions ⓘ	Impact on rivers ⓘ	Local disruption ⓘ	Cost ⓘ

Customer education (wet wipes blockages, misuse, lifting covers)	5	5	2	5	4
Separation - Sustainably preventing rainfall entering sewers / SuDS	3	2	3	2	1

THE CONTENT FOR THE FIVE ⓘ BUTTONS IN THE HEADINGS IS SAME AS FOR SP3Q1:

SP3Q2A: Are either of these options **unacceptable** to you?

	Unacceptable	Neither	Acceptable
Customer Education	O	O	O
Separation	O	O	O

SP3Q2B **ASK IF UNACCEPTABLE AT SP3Q2AR1:** Why do you say that customer education is unacceptable?

SP3Q2C **ASK IF UNACCEPTABLE AT SP3Q2AR2:** Why do you say that separation is unacceptable?

SP3Q2D Are either of these options particularly appealing to you?

	Appealing	Neither	Unappealing
Customer Education	O	O	O
Separation	O	O	O

SP3Q2E **ASK IF APPEALING AT SP3Q2DR1:** Why do you say that customer education is appealing?

SP3Q2F **ASK IF APPEALING AT SP3Q2DR2:** Why do you say that separation is appealing?

SP3Q3. Please look at the following diagram which shows two different options for Surface Water Management:

- **Separation – Traditional surface water sewers** – this would involve developing separate networks for surface water and foul water
- **SuDS and Wetlands to treat excess combined flows** – SuDS are Sustainable drainage systems which provide an alternative to the direct channelling of surface water through networks of pipes and sewers to nearby watercourses.

For each of the five headings in the diagram there is a ⓘ which you can click to see a key to the scores. Please assume that 2 (orange) is half way between 1 and 3 and that 4 is half way between 3 and 5.

Surface Water Management

1-5 Score (5= good)	Sewer flooding incidents ⓘ	Carbon emissions ⓘ	Impact on rivers ⓘ	Local disruption ⓘ	Cost ⓘ
Separation - Traditional surface water sewers	5	1	4	1	2
SuDS and Wetlands to treat excess combined flows	2	3	2	3	3

THE CONTENT FOR THE FIVE ⓘ BUTTONS IN THE HEADINGS IS SAME AS FOR SP3Q1:

SP3Q3A Are either of these options **unacceptable** to you?

	Unacceptable	Neither	Acceptable
Separation - Traditional surface water sewers	○	○	○
SuDS and Wetlands to treat excess combined flows	○	○	○

SP3Q3B **ASK IF UNACCEPTABLE AT SP3Q3AR1:** Why do you say separation is unacceptable?

SP3Q3C **ASK IF UNACCEPTABLE AT SP3Q3AR2:** Why do you say that SuDS and Wetlands to treat excess combined flows is unacceptable?

SP3Q3D Are either of these options particularly appealing to you?

	Appealing	Neither	Unappealing
Separation - Traditional surface water sewers	○	○	○
SuDS and Wetlands to treat excess combined flows	○	○	○

SP3Q3E **ASK IF APPEALING AT SP3Q3DR1:** Why do you say that separation is appealing?

SP3Q2F **ASK IF APPEALING AT SP3Q3DR2:** Why do you say that SuDS and Wetlands to treat excess combined flows is appealing?

SP3Q4. Please look at the following diagram which shows four different options for Combined and Foul Sewer Systems:

- **Increase network capacity/build underground tanks** – replace existing sewer with a large diameter sewer to increase capacity
- **Live with flooding but reduce impact of flooding** (mitigation) – keeping floodwater away from buildings and strategic infrastructure (such as electricity sub stations) in the event of a storm. This would include property level protection such as floodgates.
- **Making sewers watertight to prevent groundwater flooding**
- **Smart systems –** controlling the flow movement in reaction to the current situation.
  - Allows the system to be operated proactively, maximising the use of existing assets

- options cover a range of different approaches e.g. modifying the start-stop levels at strategic pumping stations, creation of new network control points which allow for flow to be temporarily held back in the catchment.

For each of the five headings in the diagram there is a ⓘ which you can click to see a key to the scores. Please assume that 2 (orange) is half way between 1 and 3 and that 4 is half way between 3 and 5.

Combined and Foul Sewer Systems

1-5 Score (5= good)	Sewer flooding incidents ⓘ	Carbon emissions ⓘ	Impact on rivers ⓘ	Local disruption ⓘ	Cost ⓘ
Increase network capacity / build underground tanks	5	2	5	2	2
Live with flooding, but reduce impact of flooding (mitigation)	1	5	1	4	5
Making sewers watertight to prevent groundwater flooding	3	2	3	2	2
Smart systems	2	4	2	4	4

THE CONTENT FOR THE FIVE ⓘ BUTTONS IN THE HEADINGS IS SAME AS FOR SP3Q1:

SP3Q4A Are any of these options unacceptable to you?

	Unacceptable	Neither	Acce
Increase network capacity / build underground tanks	○	○	
Live with flooding, but reduce impact of flooding (mitigation)	○	○	
Making sewers watertight to prevent groundwater flooding	○	○	
Smart systems	○	○	

SP3Q4B **ASK IF UNACCEPTABLE AT SP3Q4AR1:** Why do you say increasing network capacity is unacceptable?

SP3Q4C **ASK IF UNACCEPTABLE AT SP3Q4AR2:** Why do you say that living with flooding but reducing its impact is unacceptable?

SP3Q4Ba **ASK IF UNACCEPTABLE AT SP3Q4AR3:** Why do you say making sewers watertight to prevent groundwater flooding is unacceptable?

SP3Q4Ca **ASK IF UNACCEPTABLE AT SP3Q4AR4:** Why do you say that smart systems are unacceptable?

SP3Q4D Are any of these options particularly appealing to you?

	Appealing	Neither	Unapp
Increase network capacity / build underground tanks	○	○	○
Live with flooding, but reduce impact of flooding (mitigation)	○	○	○
Making sewers watertight to prevent groundwater flooding	○	○	○
Smart systems	○	○	○

SP3Q3E ASK IF APPEALING AT SP3Q4DR1: Why do you say that increasing network capacity is appealing?

SP3Q2F ASK IF APPEALING AT SP3Q4DR2: Why do you say that living with flooding but reducing its impact is appealing?

SP3Q4G ASK IF APPEALING AT SP3Q4DR3: Why do you say making sewers watertight to prevent groundwater flooding is unacceptable?

SP3Q4H ASK IF APPEALING AT SP3Q4DR4: Why do you say that smart systems are unacceptable?

Finally, a bit more about [**HH**: you / **NHH:** your organisation]

DP FOR FUTURE FOCUS PANEL ADD: The results from these questions will help with our analysis. Your responses will be completely confidential and not attributed to you personally, however, you may skip any question you do not feel comfortable answering

Q33. **HH ONLY:** To which of these ethnic groups do you consider you belong to?

WHITE
18. British
19. Irish
20. Any other White background

MIXED
21. White and Black Caribbean
22. White and Black African
23. White and Asian
24. Any other Mixed background

ASIAN OR ASIAN BRITISH
25. Indian
26. Pakistani
27. Bangladeshi
28. Any other Asian background

BLACK OR BLACK BRITISH
29. Caribbean
30. African
31. Any other Black background

CHINESE OR OTHER ETHNIC GROUP
32. Chinese

33. Any other ethnic group

34. Prefer not to say **CAPI: DO NOT READ OUT**

Q34. Thinking about all the people who live with you at your home, how many people, including yourself, fall into the following age groups: SINGLE CODE **ONLINE:** For each age group, please select the option that applies to you. If there are no people in your household belonging to a certain age group, please select 'zero' for it.

Up to 5 years .....0 ..... 1..... 2..... 3 4.....5+
5 to 15 years .....0 ..... 1..... 2..... 3 4.....5+
16 to 65 years .....0 ..... 1..... 2..... 3 4.....5+
Over 65 years .....0 ..... 1..... 2..... 3 4.....5+

Prefer not to say **CATI: DO NOT READ OUT**

Q35. What type of property do you live in? SINGLE CODE

Flat
Terraced house
Semi-detached house
Detached house
Bungalow
Maisonette

Q53a. Do you receive any of the following social security payments? **MULTICODE CATI/CAPI: READ OUT**

CAPI/CATI: INTERVIEWER: If they say they don't receive any benefits before you finish reading out the list, stop reading and code as "None of these"

Attendance Allowance
Carer's Allowance
Child Tax Credit
Council Tax Benefit
Disability Living Allowance
Housing Benefit
Income Support (or similar such as Employment and Support allowance)
Jobseeker's Allowance
Pension Credit
Universal Credit
Working tax credit
None of these **NOT WITH ANY OTHER CODE**
Prefer not to say **NOT WITH ANY OTHER CODE** **CAPI/CATI:DO NOT READ OUT**

Q36. Are you on WaterSure, a Wessex Water Restart scheme, a Wessex Water low rate tariff or another special tariff from your water company that helps towards the cost of your water bill?

SINGLE CODE
No
Watersure
Wessex Water Restart scheme
Wessex Water low rate tariff

Another special tariff
Don't know
Prefer not to say

Q37. **ASK NHH ONLY:** And now thinking about the organisation you work for.

How many employees does your organisation have in the UK?

Less than 10
11-100
101-249
250-499
500-999
1,000 or more

Q38. **ASK NHH ONLY:** And what business sector best defines the core activity of your company?

Agriculture, Forestry and Fishing (code A)
Mining and Quarrying (code B)
Manufacturing (code C)
Energy or water service & supply (Codes D, E)
Construction (code F)
Wholesale and retail trade (incl. motor vehicles repair but not hairdressing) (CODE G)
Transport and storage (code H) (Freight, taxis, airlines, bus, rail and warehousing, post offices)
Hotels & catering, accommodation and food service activities (Code I)(pubs, restaurants)
IT and Communication (code J) (Computer, media, publishing, software, IT consultancies)
Finance and insurance activities (code K) (banking, insurance) and real estate activities (code L) (selling/renting properties/conveyancing/property law)
Business services : Professional, scientific and technical activities (code M) (architecture, accountancy, consulting, engineering, PR, advertising, veterinary, legal of anything except property law,) and Admin and support services (code N) (cleaning, gardening, employment agencies, office services, leasing and renting of anything but properties)
Government (code O), education (code P) (schools, universities) and health (hospitals, doctors) and social work (code Q), charities)
Arts, entertainment and recreation (code R) (Libraries, theatres, museums, zoos, sport centres, fitness)
Other service activities (code S) (Trade Unions, Churches, Repair services, Funeral-related services, Hairdressers)

Q39. **ASK NHH ONLY:** How much do you agree or disagree that on a day-to-day basis, your organisation depends on its water supply and sewage services (e.g., removal and treatment of used/wastewater) in order to operate?

Strongly agree.
Agree
Neither agree nor disagree
Disagree
Strongly disagree.

Q40. CUSTOMER SAMPLE ONLY: Thank you for taking the time to give your feedback. We would like to send you a £5 incentive as a thank you for your time. Please can you let us know your email address, so that we can email this to you. We will send the voucher out by the end of October 2021.

Email address:

If you have any queries about your incentive, please contact us on 020 8742 2211.

Q41. **CAPI AND CLIENT SAMPLE ONLY**: Thank you. Would you be willing to be contacted again if we need to clarify any of the answers you have given today? And would you be willing to be invited to take part in other research for Wessex Water?

Yes, for both clarification and further research
Yes, for clarification only
Yes, for further research only
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 0800 975 9596.

CAPI: 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?
Name: [CATI: DP, IMPORT FROM ID]
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

Q13 SYSTEM INFORMATION
Q14 Time interview completed:

Q42. **ASK NHH ONLY:** And what business sector best defines the core activity of your company?

Agriculture, Forestry and Fishing (code A)
Mining and Quarrying (code B)
Manufacturing (code C)
Energy or water service & supply (Codes D, E)
Construction (code F)
Wholesale and retail trade (incl. motor vehicles repair but not hairdressing) (CODE G)
Transport and storage (code H) (Freight, taxis, airlines, bus, rail and warehousing, post offices)
Hotels & catering, accommodation and food service activities (Code I)(pubs, restaurants)
IT and Communication (code J) (Computer, media, publishing, software, IT consultancies)
Finance and insurance activities (code K) (banking, insurance) and real estate activities (code L) (selling/renting properties/conveyancing/property law)
Business services : Professional, scientific and technical activities (code M) (architecture, accountancy, consulting, engineering, PR, advertising, veterinary, legal of anything except property law,) and Admin and support services (code N) (cleaning, gardening, employment agencies, office services, leasing and renting of anything but properties)
Government (code O), education (code P) (schools, universities) and health (hospitals, doctors) and social work (code Q), charities)
Arts, entertainment and recreation (code R) (Libraries, theatres, museums, zoos, sport centres, fitness)
Other service activities (code S) (Trade Unions, Churches, Repair services, Funeral-related services, Hairdressers)

Q43. **ASK NHH ONLY:** How much do you agree or disagree that on a day-to-day basis, your organisation depends on its water supply and sewage services (e.g., removal and treatment of used/wastewater) in order to operate?

Strongly agree.
Agree
Neither agree nor disagree
Disagree
Strongly disagree.

Q44. **CAPI:** Thank you for taking the time to give your feedback. We would like to send you a £5 voucher as a thank you for your time. Please can you let us know your email address, so that we can email this to you. We will send the voucher out by the end of September 2021.

Email address:

If you have any queries about your incentive, please contact us on 020 8742 2211.

Q45. **CAPI and NHH ONLY**: Thank you. Would you be willing to be contacted again if we need to clarify any of the answers you have given today? And would you be willing to be invited to take part in other research for Wessex Water?

Yes, for both clarification and further research
Yes, for clarification only
Yes, for further research only
No

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

CATI/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 0800 975 9596.

CAPI: 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?

Name: [CATI: DP, IMPORT FROM ID]

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

Q15	SYSTEM INFORMATION
Q16	Time interview completed:

INTERNAL USE ONLY: Click here
Online only ☐
CATI only ☐ (DP: add QAX)
CAPI/Tablet ☐ (BCQs:) QAZ2 Paper showcard? Y ☐ ☐
N
CATI recruit for online/field ☐ (BCQs:) QAZ3
Field recruit for online/CATI ☐ (BCQs:) QAZ1
Recruit only (ie for qual) ☐

Grid style for mobiles: click here for example
GM 1 ☐ to force mobiles to show grid (for small grids)
GAR 1 ☐ to show vertical text for answer headings
GAR 2 ☐ to show vertical text for answer headings on mobile devices only

Questionnaire Style (default is 7): Click here for details

Choose base format:	Choose variations:
Accis3 ☐	Question and answer fonts (full list: https://fonts.google.com/)
Accis4 ☐	Header font ☐
Accis5 ☐	Tick box style (1-6) ☐
Accis6 ☐	Next/previous button style (1-3) ☐
Accis7 ☐	Font colour (use HEX code http://html-color-codes.i☐/#HTML_Color_Picker)
Accis8	

Other colours: Note that CLR1 and CLR6 change a number of different elements (to easily keep the colours consistent)

CLR1 # ☐ Progress bar border, progress colour, button colour
CLR2 # ☐ Progress bar background colour
CLR3 # ☐ Page background colour
CLR4 # ☐ Header background colour (if different from CLR1)
CLR5 # ☐ Header font colour
CLR6 # ☐ Border colour for selected checkbox and checkbox border colour when hovered over (if differ# ☐ CLR1)
CLR7 # ☐ Background colour for selected checkbox (if different from CLR1)
CLR8 Tick/circle colour for selected checkbox

Appendix B

Participant Characteristics

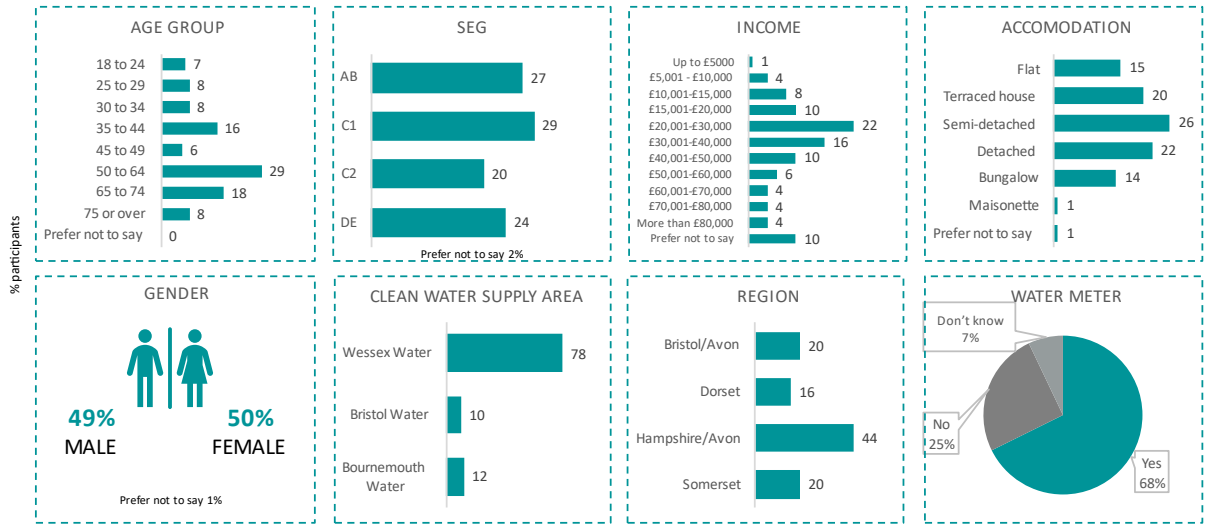
Appendix B Participant characteristics

Quotas were set on demographic characteristic to ensure we gained feedback from a representative spread of customers. The following definitions were applied to identify various customer segments:

- **Vulnerable:** anyone with low income (under 15k/year) OR struggles to pay their bill (or in debt) OR has a health issue (disability or COVID) OR on benefit OR are on a special water tariff (note: these often overlap).
- **Digitally excluded:** not connected to the internet within the last 3 months OR don't feel confident about using the internet OR not have access to either a smart phone, tablet or laptop/desktop at home.
- **Future customers:** under 29 and have no bill payment responsibility.

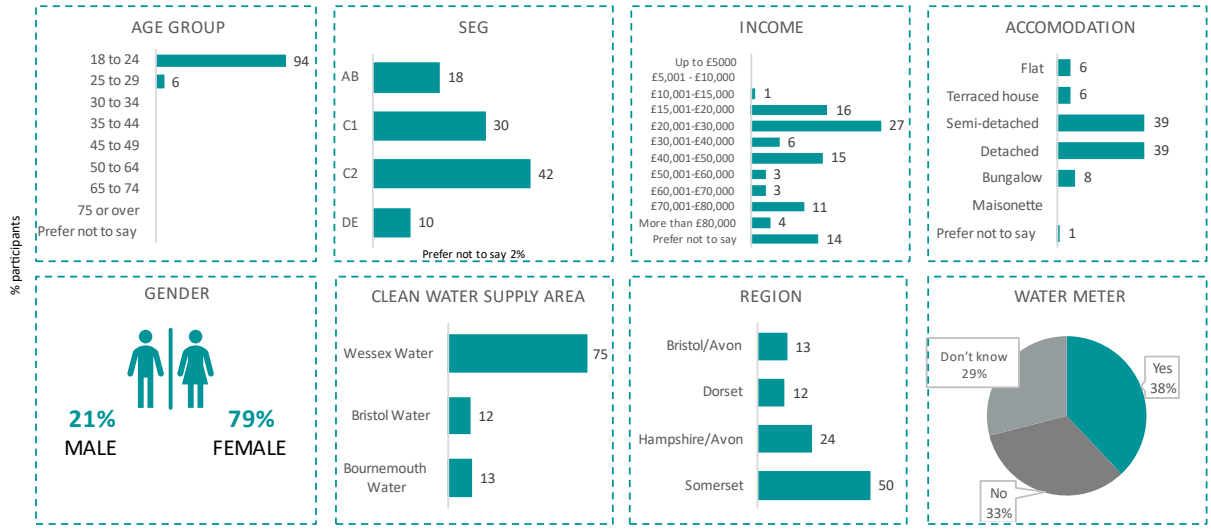
The demographic and firmographic profile of the participants is outlined in the following charts.

DEMOGRAPHIC BREAKDOWN– 1,855 INTERVIEWS WITH HOUSEHOLD CUSTOMERS
SAMPLE OVERVIEW



Weighted base size: n=1855. Result in percentage unless specified otherwise. Percentage may not total 100 due to rounding.

DEMOGRAPHIC BREAKDOWN– 47 INTERVIEWS WITH FUTURE CUSTOMERS
SAMPLE OVERVIEW

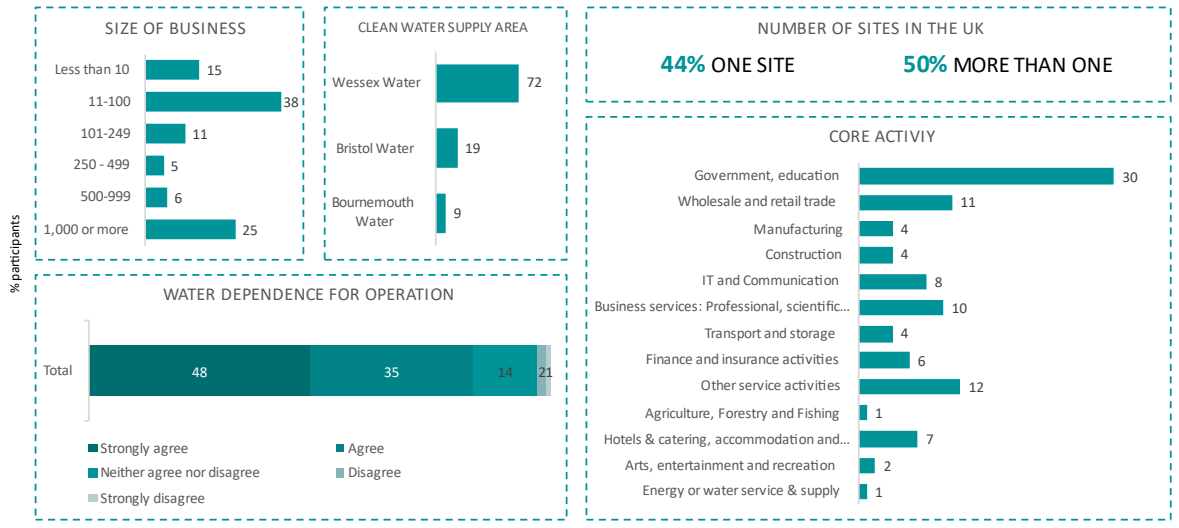


2

Weighted base size: n=47 . Result in percentage unless specified otherwise. Percentage may not total 100 due to rounding.

Accent

SAMPLE BREAKDOWN– 279 INTERVIEWS WITH NON HOUSEHOLD CUSTOMERS
SAMPLE OVERVIEW



3

Weighted base size: n= 279. Result in percentage unless specified otherwise. Percentage may not total 100 due to rounding.

Accent

WESSEX WATER DRAINAGE WATER MANAGEMENT PLAN (DWMP) – CUSTOMER RESEARCH DESIGNED AND CONDUCTED IN LINE WITH OFWAT'S HIGH QUALITY RESEARCH PRINCIPLES

PR24 and beyond: Customer engagement policy

Useful and contextualised

Participants were informed about Wessex Water (WW) and the need for a DWMP.

It was clearly outlined that the research results would be used by WW to help create their DWMP.

Continual

Insight from the WW SDS research, which was conducted shortly before the DWMP research, was incorporated. Other WW insight was incorporated when appropriate.

Qualitative participants and expert stakeholders who had taken part in the SDS research were reconvened to provide their views on the DWMP (in addition to 'fresh' participants in the DWMP quantitative research).

Neutrally designed

Fit for purpose

Materials were designed to ensure participants were provided with facts without stating whether there was a preferred option for the company.

Quantitative question scales were designed with equal weight to positive and negative responses. A neutral response was also given along with the option to decline to provide an answer.

Due to the breadth of coverage required, two interlinked quantitative surveys ran to ensure a maximum survey length of 15-20 minutes (industry best practice).

The quantitative surveys were piloted ahead of full launch.

Inclusive

Feedback was obtained from

- Industry stakeholders and experts
- Retailers
- HH customers (including vulnerable customers and those who had experienced a sewer/waste water incident)
- NHH customers

A mixed method approach was utilised including:

Qualitative: expert panels, online workshops with reconvened HH and NHH participants, tele depths with vulnerable participants and customers who had experienced a sewer/waste water incident.

Quantitative: Online via a commercial panel, online with WW panel, online with employees, phone-email-phone for NHH.

Face to face to reach those less well represented through online methods:

- Those over the age of 75
- Those in social grade E
- Digitally disengaged

Ethical

Research was conducted according to the Market Research Society's Code of Conduct.

Accent is a Market Research Society Company Partner and is ISO20252 accredited.

Independently assured[4]

An expert panel of stakeholders was formed to provide guidance at both the start and the end of the research process, and comment on the results obtained.

Qualitative and Quantitative Research conducted August – November 2021 with a range of stakeholders and customers.

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