

Submission #2 – Newgate Research’s Response to the Essential Services Commission’s Draft Decision on Melbourne Water’s 2021-2026 Price Proposal, March 2021

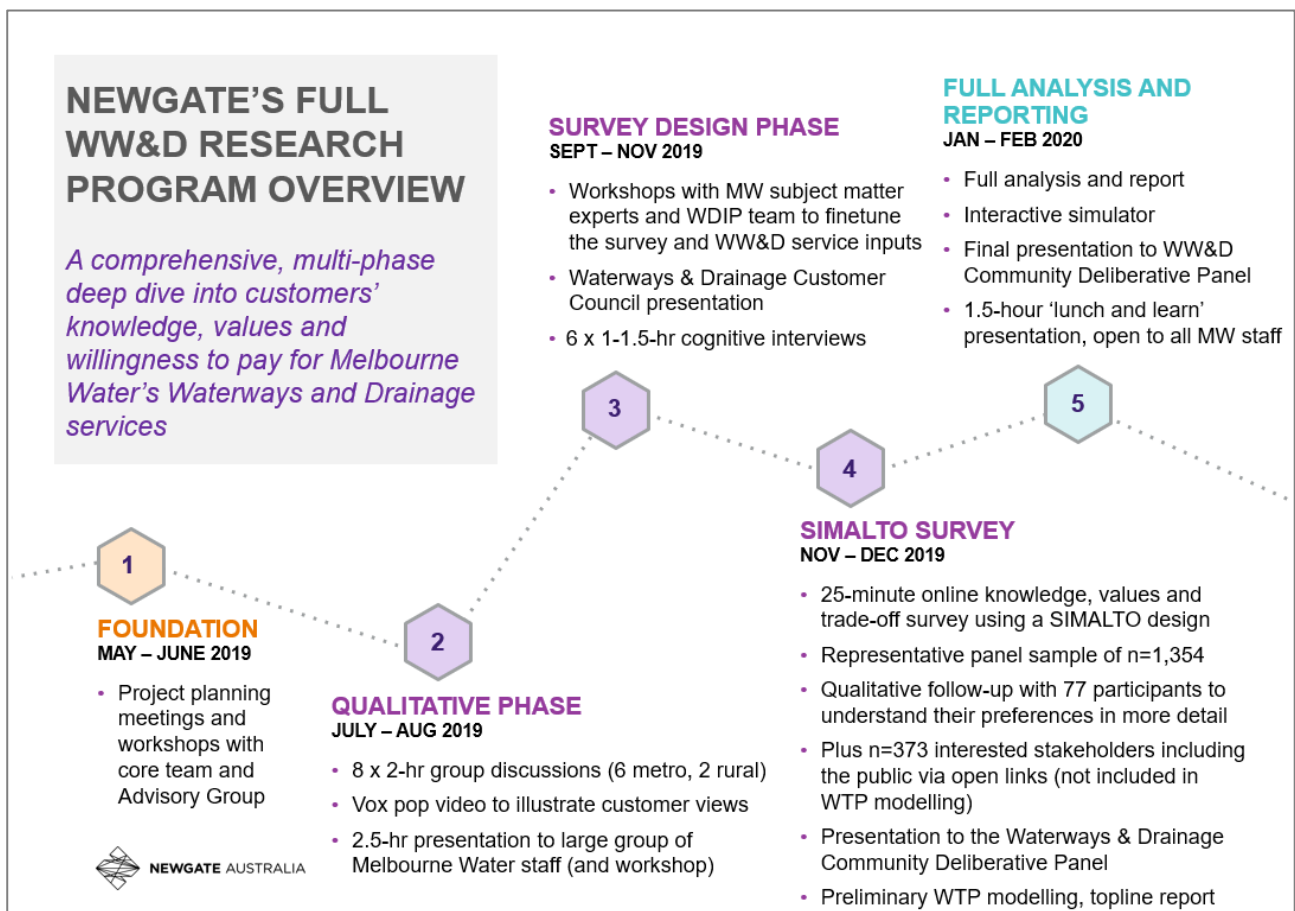
BACKGROUND

Melbourne Water engaged Newgate Research in early 2019 to undertake a study to help determine its customers’ preferences and willingness to pay for services funded by its Waterways and Drainage (WW&D) charge, to support Melbourne Water’s *Price Submission 2021*.

Newgate Research noted as an important caveat to its findings that while the majority of customers in the research indicated a preference for an in-principle price rise to support service improvements they wanted to see, the broader customer base would need to be appropriately engaged and educated on the details of any increase in cost in order to accept this.

We understand Melbourne Water was using this study as one input into its broader, extensive program of customer and stakeholder engagement. This study built on learnings from this broader engagement program, including an in-depth qualitative customer research study conducted by Newgate Research for the organisation in 2018 to understand customer values regarding its full range of services (not just WW&D), and a subsequent quantitative survey to measure customer values and service priorities (separate to the WTP study regarding the WW&D services).

The diagram below summarises the research program Newgate was commissioned to undertake:



NEWGATE RESPONSES TO THE ESC'S DRAFT DECISION

Newgate Research provides its responses herein to key statements within the Essential Services Commission's (ESC's) draft decision on Melbourne Water's Price Submission 2021¹. Original wording from the ESC is coloured blue throughout, with Newgate Research's responses below each body of blue text.

Please note that in January 2021, the ESC issued a series of questions for Melbourne Water to respond to regarding its submission. As part of this response, Newgate Research provided answers to Melbourne Water, which were then provided to the ESC (3 February 2021). Upon reading the ESC's draft findings, it is unclear if these answers have been included in the ESC's considerations. Where appropriate, these points of relevance are noted throughout this response.

- a) "The findings are interpreted by Melbourne Water as suggesting the majority of residential customers in the metropolitan area were willing to pay up to \$8 more across the regulatory period for improvements in stormwater quality management and wetland condition flood protection, amongst other things.

Melbourne Water has used this study to justify its proposal for increasing the waterways and drainage charge to recover an additional \$43.5 million investment in waterways and drainage services." [p. 7]

Newgate response: As with all choice studies, the findings from our research are highly contextual and need to be considered within the appropriate realities of the objectives of the study, as well as the time when it was undertaken. Any willingness to pay (WTP) findings from this work are contingent on Melbourne Water's customers being appropriately informed and engaged on the nature of the Waterways & Drainage (WW&D) charge, and the various services this entails – which Newgate Research noted would require significant customer education to achieve.

Newgate Research outlined this caveat in detail within the full report provided to Melbourne Water. Again we note that this study was just one part of Melbourne Water's broader, extensive engagement program and deliberations, and that in its submission to the ESC, Melbourne Water requested a price increase of \$1 per year for this service (resulting in the charge being \$5 higher than the current charge at the end of the 5 year regulatory period), rather than an \$8 upfront increase.

- b) "We reviewed Melbourne Water's SIMALTO study and found that SIMALTO is not a widely recognised method of estimating willingness to pay. It has limited presence in the relevant academic literature and therefore it is not clear whether it is scientifically validated for this purpose." [p. 8]

Newgate response: Newgate is always extremely mindful of objectively recommending methodologies that are fit for purpose. This is a key tenet of our quality assurance program and one of the main reasons why clients turn to us for our services. We engaged in extensive consideration and consultation to determine the most suitable approach to address this particularly complex and sensitive brief from Melbourne Water (including potentially using choice modelling

¹ <https://www.esc.vic.gov.au/water/water-prices-tariffs-and-special-drainage/water-price-reviews/melbourne-water-price-review-2021#tabs-container1>

and conjoint analysis approaches), and the advice we received as well as our own conclusion was that SIMALTO would be the best fit in this situation. We stand by that decision and note previous SIMALTO research programs undertaken for Melbourne Water and City West Water, as approved by the ESC.

SIMALTO is a highly specialised technique that is suitable only in very specific use cases and is highly dependent on the context of the study and what is being tested. A key priority in its original creation and design was to inform complex, real-world commercial decisions around service design rather than questions of a more academic nature. Given this is such a highly specialised and context-specific technique, SIMALTO remains comparatively less well known than simpler, more common WTP methods.

Considering its known limitations (as outlined by the ESC), SIMALTO is only suitable in circumstances where alternative preference modelling approaches (such as primarily conjoint methods) are unable to provide a sufficiently 'real world' experience for research participants to engage with on important decisions such as those considered here, and in turn, in the generation of equivalently robust models. Such decisions are primarily driven by the number of attributes or "service mix" that needs to be tested and the level of familiarity respondents will have with the subject matter being tested.

Traditional choice modelling methods (including conjoint analysis) would have resulted in unacceptable and excessive cognitive loads when handling the nature and number of service attributes customers needed to consider in this study. Importantly, this would be without provision for the significant "respondent education" that was essential in explaining Melbourne Water's services, for participants to provide genuine and meaningful responses (see response below on "SIMALTO as a stated preference technique" for a more detailed analysis of these issues). As such, we ruled out other approaches as inferior and inappropriate in this instance.

- c) "Melbourne Water has provided us insufficient evidence in its price submission and in response to our further questions on the way the SIMALTO technique was used to estimate customer preferences. In particular, the simulation methodology that was used to analyse the data, which was described in its initial report as 'a bespoke mathematical model derived from approaches similar to neural network designs' is not at all transparent to us and makes the method by which the outcomes were derived a 'black box'. In addition, the spreadsheet model Melbourne Water provided us was locked, preventing any formal examination of the method or tools applied. Only outputs were provided. Because of this lack of transparency, we do not understand how the willingness to pay analysis was performed or whether the analysis undertaken is fit for purpose." [p. 8]

Newgate response: Melbourne Water approached Newgate for additional information to assist the ESC's consideration of its price submission. In early February 2021, we provided a response to a series of questions from the ESC and understand this was passed on at the time by Melbourne Water for the purposes of the ESC's assessment.

Specifically, we provided detailed answers to the ESC's initial questions re the mathematical approach used, and we offered to provide further information if needed. We also provided Melbourne Water with the unlocked spreadsheet model for examination by the ESC, which Melbourne Water also provided to the ESC.

We are very happy to assist with further access to the data and modelling, as well as explanations if these are still not sufficient for the ESC's needs. We are disappointed by claims that our approach is non-transparent or a 'black box', as these claims are in opposition to our values and

our best practice principles of engagement (see response below on “SIMALTO as a stated preference technique” for further detail).

- d) ‘It is unclear that the SIMALTO study derived unbiased measures such as willingness to pay and the extent to which the values obtained for these measures in hypothetical settings corresponds to their values in real-world settings (hypothetical bias). Generally, when hypothetical bias has been found, it results in higher willingness to pay outcomes than those found to exist in real markets and we are not satisfied that the measures undertaken by Melbourne Water to try to eliminate hypothetical bias were, or could have been, sufficient given the nature of the survey (see Appendix C for more details).’ [p. 8]

Newgate response: We agree that hypothetical biases are very challenging in studies such as these and require careful planning to reduce their effects, as well as supporting evidence from other research (such as qualitative research) and customer engagement activities. As such, we took extensive and rigorous measures to address such potential biases in the research – both in the design of the survey and the analysis. We provided direct answers to hypothetical bias challenges in our February response.

In addition to this, we discuss adjustments made to the data to account for WTP overclaiming in the Appendix below, on p. 8. We also wish to emphasise that customers’ willingness to pay for the services was explored in a range of ways within the extensive qualitative research and engagement conducted as part of this program. This included unprompted questions and framing in the context that the WW&D charge and associated services were only one part of the services charged for on customers’ water bills. This broader approach provided additional confidence in the validity of the findings from the SIMALTO survey and modelling – again, to be taken in the context that this willingness to pay assumes a greater level of customer education about the services than we know existed within the broader community at the time of the research.

We also note that this willingness to pay was expressed *in principle*, as it was explained to survey participants that this only covered some of Melbourne Water’s services, and so customers did not have visibility of other potential price implications stemming from Melbourne Water’s broader price proposal. This was not possible at the time of the research as Melbourne Water was naturally developing other aspects of its proposal in parallel, but this should not detract from the findings either within the context in which they were presented to customers, nor in relation to the overall context in which the project was set.

Having said this, we understand that this broader context of its proposal was addressed by Melbourne Water via other engagement methods implemented through Stage 3 of its engagement program.

- e) “The SIMALTO type questions posed to respondents may be subject to errors or bias. That is, respondents answering SIMALTO type questions cannot be assumed to be perfect decision makers making no errors, particularly given the large number of choices they are expected to make or the large number of choices that are required to be made within a budget. Any mistake made by the respondent in answering the original questions, or uncertainty in their responses, will impact on their calculated willingness to pay. Without correction, there is a high probability that the outputs from this SIMALTO model are biased and we are not satisfied that Melbourne Water took sufficient steps to mitigate this type of error.” [p. 8]

Newgate response: As with all data collection, error is an inherent facet of research, and we by no means assumed participants would be perfect decision makers (nor do we ever) – not least

because these are difficult decisions for anyone to make, that rely on a suitable level of understanding, time and information. To address this, we employed numerous data quality safeguards (e.g. during the survey design, the collection of data, and assessment of data post fieldwork) to minimise the inevitable nature or error in data collection. These approaches were again outlined in detail in our February response, and are elaborated upon in the Appendix below.

Further to this, we would emphasise that the SIMALTO approach gave participants the opportunity to step through and consider their preferences and trade-offs regarding the services in a far more genuine and meaningful way than would have been possible through the use of conjoint analysis (for example), including the ability to change their initial service level preferences at any time before making any WTP decisions. We believe this level of consideration was appropriate for the importance of the decisions that participants were explicitly asked to provide input into, and we received feedback from participants in the research and engagement program to support this. We also believe this was in keeping with the principles of good customer engagement within the ESC's PREMO framework²; being broad, deep (meaningful) and starting early.

- f) “We note that where SIMALTO has been used to inform past price submissions, it was used to identify service level trade-offs. We accepted SIMALTO when used for this purpose.” [p. 9]

Newgate response: We would like to understand the specific difference that the ESC has identified here, in order to enable us to provide a more specific response to this.

The 2019 survey design and the generated outputs within our report followed the structure submitted by Melbourne Water in its ESC-approved 2016 price submission, which clearly focuses on service level trade-offs (although the number of service types included in the trade-off exercise was reduced to 13 instead of 18, as one of several measures to optimise the data quality and quality of engagement for participants – please see initial February responses for examples of other such measures).

g) **Design of willingness to pay studies**

“Water corporations seeking to rely heavily on a willingness to pay study must ensure the findings are sound. This means the methodology must be well supported and the analysis fully transparent. The study must be designed in a way to comprehensively address the known limitations and biases associated with studies of this nature. This is not the case with Melbourne Water’s SIMALTO study.” [p. 9]

Newgate response: Newgate Research is a quality accredited (ISO 20252) market and social research provider, a Company Partner to the industry’s professional body (The Research Society), and an invited member of the Australian Polling Council. Several members of staff maintain Qualified Professional Researcher (QPR) accreditation, including within the team that delivered this research program to Melbourne Water. Our statistical analysis partners for this work at The Clever Stuff have extensive experience with willingness to pay and trade-off studies (including conjoint analysis and SIMALTO) within Australia and overseas. In partnership with The Clever Stuff, several of our most senior researchers designed and conducted this program, including our Chief Data Scientist, Dr Benjamin Wegener (PhD), whom we note is a finalist in this year’s Research Effectiveness Awards (<https://researchawards.com.au/award-types/research-effectiveness-awards/>).

² <https://www.esc.vic.gov.au/sites/default/files/documents/Water-Pricing-Framework-and-Approach-Final-Paper-Oct-2016.pdf>

Our reputation rests on our ability to design and deliver fit for purpose research programs that accurately gather the data and evidence our clients need to inform their decision making. This entails implementing rigorous controls and measures to suitably address the limitations and biases inherent in *any* research. As noted in our February response, we wanted our report on the survey findings to be accessible to the general reader, and sought to strike the right balance of information to maintain reader engagement, while we are always happy to provide further clarification to those interested. We would add that our report was far more detailed than the 2016 SIMALTO research report.

With respect, we request that ESC give further consideration to the comprehensive, multi-point engagement approach we (and Melbourne Water more broadly) undertook as part of the entire research program examining the preferences and in-principle willingness to pay among Melbourne Water's customer base, including our separate report on the qualitative research phase. We also note that this work applied all 14 principles outlined by the Water Services Association of Australia's 2019 guidance paper into conducting robust willingness to pay studies in the Australian water sector.

Specifically, the SIMALTO survey was a *component* of this research program aimed at understanding and measuring customer preferences and willingness to pay with regard to 13 of the services associated with the Waterways and Drainage Charge. This design was purposely chosen for two primary factors:

- 1) the ability of the latest SIMALTO techniques to measure trade-offs, preferences and willingness to pay for complex, multi-attribute products; and
- 2) its record as an accepted method by the ESC to measure these same criteria in Melbourne Water's 2016 price submission.

As noted earlier, this quantitative work was supported by broad and in-depth qualitative research and engagement across the range of relevant Melbourne Water stakeholders, including with its Customer Council.

We note Point 2 above as it guided both the design of this work, as well as the final research outputs Melbourne Water provided to the ESC as part of this price submission (which followed a similar structure to that provided to the ESC as part of Melbourne Water's 2016 price submission).

As noted earlier, we specifically ruled out other more traditional willingness to pay trade-off techniques like purely choice modelling and conjoint analysis, as they would have had fundamental flaws and limitations, with a completely unacceptable lack of information and level of cognitive overload for participants in considering the specific service mix under the WW&D charge.

h) Use of willingness to pay studies

"We consider that an effective willingness to pay study has a role in supporting robust and well justified expenditure proposals. Willingness to pay studies should inform, rather than replace, robust expenditure forecasts. This reflects our role in ensuring customers pay only for proposals that are prudent as well as efficient.

Our preference is to see the findings of willingness to pay studies sit alongside engagement approaches that test and verify customers' preferences and their willingness to pay for new initiatives.

Our draft decision places a low weighting on this willingness to pay study. Appendix C outlines in more detail the shortcomings in the use of SIMALTO as a stated preference technique for the purposes of establishing customers' willingness to pay." [p. 9]

Newgate response: We fully agree with the ESC's recommendations that willingness to pay studies should inform, rather than replace, robust expenditure forecasts. Indeed, our final report highlights the importance of factoring in a range of alternative engagement approaches – not just the SIMALTO outputs – when formulating decisions around overall customer willingness to pay. This was also further elaborated upon in our initial February responses.

Although we believe that of all the possible preference modelling approaches available today, the SIMALTO design was the most appropriate given the range of services being tested in the current project, it was always intended by Newgate Research to be a key, *supporting* component of Melbourne Water's overall price submission.

In turn, we understand that Melbourne Water used the survey results in a manner that was consistent with this intention, in that it did not use the survey findings as an unbiased measure of willingness to pay to directly determine the level of the Waterways and Drainage Charge. A compelling piece of evidence supporting this is the fact that Melbourne Water did not seek an \$8 increase to the annual charge (which our research found the majority of customers were willing to pay for their preferred service mix) – instead seeking a notably lower increase of \$1 per year over the 5-year regulatory period (i.e. rising to \$5 in the final year).

A more detailed response to the ESC's critiques of SIMALTO as a stated preference technique is provided below.

i) RESPONSE TO APPENDIX C: SIMALTO AS A STATED PREFERENCE TECHNIQUE [PP. 94-96]

SIMALTO involves exploring customer values and preferences relating to multiple product or service attributes. It is not a proprietary approach or 'product', and its application can vary widely in practice. SIMALTO has been used in a wide range of contexts to understand customer views about preferred services and willingness to pay, most commonly by commercial businesses and local governments, as well as some applications by water and energy utilities – both internationally and within Australia.

Furthermore and with due respect, the ESC's suggestion that self-explicative approaches largely disappeared from academic literature in the early 2000s is incorrect, with its critique risking the portrayal of a stagnant research field that has abandoned self-explicative approaches when measuring complex service level preferences and willingness to pay.

Putting aside the numerous and recent real-world applications of SIMALTO (and similar self-explicative) approaches by industry and government organisations around the world, an examination of the academic literature in this field shows a vibrant and active field of research. There is extensive, current debate and innovation around how to most effectively measure customer values, choices and willingness to pay for services or products that involve complex, multiple attribute scenarios, including self-explicative approaches (e.g. Malhotra et. al 2009, Park et. al. 2008, Feuz & Norwood 2019, Netzer & Srinivasan 2007, Netzer et. al 2008).

Indeed, when examining the literature presented by the ESC in its critique of such work, only a single study was published after the year 2000 – a study which, although questionable in both its approach and relevance to this work, actually highlights this reality of the continuous academic debate and development currently underway in the field of willingness to pay research, with its own conclusions stating that there is no reason to discard particular approaches altogether.

Unfortunately, this is the nature of academic debates, with strengths and weaknesses of respective techniques being continuously identified and tested in their specific contexts. In this respect, we

found it particularly concerning that the ESC did not list in its critique a single academic paper that explored the same type of context that is fundamental to the Waterways and Drainage Charge (i.e. a complex, multi-attribute service mix being tested as a choice study). Instead, where given, each supporting citation centred around a simple choice model approach, testing the preferred preferences of a highly familiar scenario to consumers that did not require comparative participant education, such as choices around a preferred type of gym bag or sweatshirt (Hofstetter et. al. 2020) or job types for potential applicants (Nitzsch & Weber, 1993).

Although there is no doubt that measuring customer preferences and willingness to pay contains a range of challenges and potential pitfalls (as described in the ESC's own critique), this is true for any method chosen as a measurement tool in the field of choice studies. It is for that reason that we emphasise how critical it is that comparisons between preferred choice methods be made within accurate, comparable contexts, because although in one context one method may be superior, in another, the opposite is regularly true.

Furthermore, it is within this reality of evolving choice methodologies that we find the ESC's critiques of not using the original SIMALTO design (as described by Green in the 1970s) for our work to be particularly puzzling (highlighted text below in blue taken from the ESC's findings):

- j) "Newgate Research has extended SIMALTO beyond its original formulation by requiring respondents to indicate how much they would be willing to pay" [p. 94]

and

- k) "Presented with these three alternatives, respondents are asked a discrete choice question as to which alternative they would choose given prices calculated based on their previous selections (a form of choice based conjoint question). This too represents a deviation from the original SIMALTO questionnaire format. Finally, respondents are asked to respond to an open-ended contingent valuation question." [p. 95]

The reality we have described above – that of a continuously evolving field of research and real-world applications – is the very reason why we did not follow the precise methods first described when SIMALTO was invented. Instead, we applied the learnings and developments from the active field of choice studies to ensure we measured, as accurately as possible, customer preferences and WTP within the context of the Melbourne Water customer knowledge base and the specific nature of the WW&D services, while also factoring in the ESC's own previous decisions in relation to this method.

We would add that we used the same design for the SIMALTO exercise in the questionnaire as per Melbourne Water's previous SIMALTO study (including the willingness to pay questions after each service choice round and the subsequent discreet choice question after the three rounds). We understand that John Green, who created the original SIMALTO approach, was consulted during the development of Melbourne Water's previous SIMALTO study, and that he accepted and appreciated the refinements made to the methodology (including providing participants with more information about each service type, to enable more genuine and meaningful deliberation in the context of Melbourne Water's specific service types).

As stated in our report on the SIMALTO findings, the WTP modelling resulted in the most preferred price for the most desired service mix at \$110 per year for the metropolitan residential WW&D charge (vs the current \$102), and \$64 for rural customers (vs the current \$56), with over two-thirds of each group indicating a preference for that price. The WTP modelling – undertaken by our consultant at The Clever Stuff – was based on both the specific service level selections at each of the three rounds of the SIMALTO exercise and the corresponding price they were willing to pay for

their preferred service mix at each round, with the subsequent discrete choice question and open-ended contingent valuation question used as cross-validation measures for the modelling outputs.

Importantly, a particularly conservative discount factor of 4 was applied to the data to account for overclaiming, participant error and the complexity of the subject matter. This discount factor was higher than suggested by the current literature when factoring in the overclaim realities of WTP (reviewed in extensive analyses by Schmidt & Bijmolt 2020 and Kanya et al. 2019), to further account for:

- a) WTP biases being commonly estimated as higher for products / services such as those where participants tend to be less familiar with the subject matter; and
- b) Questions regarding improved environmental outcomes, as these tend to result in greater altruism compared to everyday consumer products.

This adjustment was just one measure taken to account for hypothetical bias, in addition to those described in our February response (which included instructions and information about the process and real-world implications of their responses, selections and decisions, as provided to the survey participants).

As outlined in our earlier responses in this document, the ESC approved Melbourne Water's last price submission that utilised SIMALTO. In addition to the rationale summarised here, this recent, previous acceptance by the ESC for this specific approach should be recognised as a genuine factor in the research approach undertaken in this work, particularly given the aforementioned lack of academic consensus around choice modelling methods.

The approach Melbourne Water undertook empowered participants to consciously step through the key services and service level options in a similar way to how they might process and weigh up an important decision in real life, and feedback from participants indicated that although this was challenging, they felt it was important and appreciated being given the opportunity to contribute to Melbourne Water's decision-making.

By comparison, the suggested alternatives of the ESC, such as through the use of conjoint type analyses alone, would have seen participants being asked to choose a whole 'package' of the services, which we know they would have lacked sufficient basic understanding of in order to genuinely decide or know what they were selecting, thereby risking strong criticism from customers and other stakeholders as being confusing and disingenuous. *Within this specific context* such an approach would have been so flawed that it would have been professionally irresponsible for us to have recommended it.

References:

Feuz, R., Norwood, F.B. (2019) Valuing College Graduate Attributes and Skills: Employer Willingness to Pay as Elicited through Design Valuation, Applied Economics & Teaching Resources, volume 1, Agricultural & Applied Economics Association.

Hofstetter, R., Miller, K.M., Krohmer, H. and Zhang, Z.J. (2020) A de-biased direct question approach to measuring consumers' willingness to pay, International Journal of Research in Marketing.

Kanya, L., Sanghera, S., Lewin, A. & Fox-Rushby, J. (2019) The criterion validity of willingness to pay methods: A systematic review and meta-analysis of the evidence, Social Science & Medicine, 232, 238-261

Malhotra, N.K. (2009) Review of Marketing Research, volume 5, M.E. Sharpe Inc. New York

Netzer, O., Toubia, O., Bradlow, E. T., Dahan, E., Evgeniou, T., Feinberg, F. M., Feit, E. M., Hui, S. K., Johnson, J., Liechty, J., Orlin, J.B., & Rao, V. R. (2008). Beyond Conjoint Analysis: Advances in Preference Measurement. Marketing Letters, 19 (3/4), 337-354.

Netzer, O., Srinivasan, V. (2007) Adaptive Self-Explication of Multi-Attribute Preferences, Research Paper Series, Stanford: Graduate School of Business

Nitzsh, R.V. and Weber, M. (1993) The effect of Attribute Ranges on Weights in Multiattribute Utility Measurements, Management Science, 29, 937-943.

Park, Y.H., Ding, M., Rao, V.R. (2008) Eliciting Preference for Complex Products: A Web-Based Upgrading Method, American Marketing Association

Schmidt, J. & Bijmolt, T.H.A. (2020) Accurately measuring willingness to pay for consumer goods: a meta-analysis of the hypothetical bias, Journal of the Academy of Marketing Science, 48, 499-518

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