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Yorkshire Water's Water Resource Management Plan 2024 – Strategic Environmental Assessment

Environmental Report - Appendices

Report for Yorkshire Water

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Yorkshire Water

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Environmental Assessment of the WRMP

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Appendices

Appendix A - Statutory consultee responses to the SEA Scoping Report

Note: Consultee responses on the Water Resources North (WReN) Regional Plan Environmental Assessment Scoping Report were also addressed in the development of the WRMP24 Environmental Report and are therefore provided within this appendix for information.

Table A.1 WRMP24 SEA Scoping Report Statutory Consultee Responses

[PUBLIC VERSION]

Author	Comment	YW Response
Historic England	*Comments recieved from Historic England on the Yorkshire Water SEA Scoping Report are replicated from the comments on the WReN Scoping Report, please see WReN comment log.*	See WReN Comment Log
Natural England	Natural England is satisfied with the proposed scope and level of detail to be included in the Environmental Report and the associated scope of the Habitats Regulations Assessment.	Noted. And we also confirm the extensive data sets referenced in attached Annex and the list of natural environment issues to consider will be reflected in our assessment, and enhancement opportunities will be identified where appropriate.
Environment Agency	s4.2.1.1: "Implementation of Yorkshire Water's WRMP options are not expected to increase the distribution of these invasive non-native species. Impacts to the physical environment as a result of these options will lead to increased mortality of invasive non-native species and the impairment of pathways to further distribution as a consequence of reduced river flows." This reads as an attempt to justify changes to natural river flow regimes on grounds of INNS management. Please remove. Please ensure that INNS risks are assessed in line with current policy and guidance.	We will remove this text and can confirm full consideration of INNS risks is made throughout the option identification process and in the environmental assessment.
Environment Agency	WFD (Section 4.5, etc.): all WFD-driven matters were transposed into UK law, therefore their application is unaffected by subsequent changes. The current wording ties itself in knots. Perhaps, to clarify the document's approach,, rather than referring to WFD, it would be more appropriate to use the legislation as applicable in England?	The wording in this section, to be included in the Environmental Report, will be streamlined for clarity.
Environment Agency	s4.5.1.6: Table 4.8 should make clear the flow band at which these water availability assessments have been made.	The title will be updated in the Environmental Report to clarify this is at Q95
Environment Agency	s4.10 would benefit from an explanation of how inter-relationships will be consistently identified and assessed.	Within the review of baseline, Section 4.10 serves to acknowledge that inter-relationships between the topics may exist, and that 'changes to individual effects are considered through the assessment of synergistic effects'. Further details of the approach to the cumulative assessment is found in Section 5.2.2.
Environment Agency	s5.1 Note that any decisions made based on the current state of the environment must not hinder or block its future improvement in any aspect.	Agreed.
Environment Agency	Table 5.1: What does PPP signify?	Plans, polices and programmes. The column heading will be updated in the Environmental Report to spell this in full.
Environment Agency	s5.2.1.1: "a detailed suite of environmental and social datasets that are available at a consistent quality across the geographical footprint of all the options under consideration." Please provide further detail of what these are and how their suitability will be demonstrated (applies also to s5.3.1, etc.).	The datasets used are typically open source data available on a national scale on data.gov.uk e.g. designated sites, ancient woodlands, permitted and historic landfill, flood zones, AQMAs, listed buildings etc.
Environment Agency	s5.2.2.1: "Assessment of cumulative effects of the Yorkshire Water WRMP with the Yorkshire Water Drought Plan, the WReN Regional Plan, other water company Drought Plans and WRMPs, Environment Agency Drought Plans and other relevant water management plans. The potential for a neighbouring company implementing options under its WRMP simultaneously will be considered." How will this be undertaken? and how will the outcomes be reflected across the plans?	The Yorkshire Water WRMP Environmental Report will include an appraisal of likely in combination effects of the WRMP and other plans, see the WRMP19 Environmental Report Section 8.4 for an indication of the content of this section. Each other plan would also include a bespoke assessment of it's own.
Environment Agency	s5.3.1: "The Natural England Biodiversity Metric 2.0 will be utilised for the assessment of the WRMP options which will require a number of assumptions given the high level nature of the assessment, which are set out below." Its use will require assumptions? Or it is to be used because assumptions are required?	The use of the Metric 3.0 will require assumptions given the high level nature of the appraisal. See Section 5.3.2.1 which states: *The following assumptions will be made where required:* •*Where data on habitat quality is not available for a habitat, 'good' condition will be assumed to provide a precautionary assessment.* •*Where data on strategic significance is not available, 'high' strategic significance will be assumed to provide a precautionary assessment.* •*Where detailed information is not available a land take of 10m will be assumed for pipelines.*

Environment Agency	s6.1: "The natural, social and human capitals overlap with the SEA objectives, which must also be considered for each option. The combined approach to including SEA, BNG and capitals will provide data for relevant metrics in the optional appraisal system (i.e. environment performance metric and the human and social wellbeing metric)." How are these measured?	Further details on the option appraisal methodology are found within the method statement for that workstream.
Environment Agency - NEAS	Baseline information feels very generic in places, and often the focus is on explaining the legislation / policy pertinent to the SEA topic as opposed to giving baseline characteristics or interpreting the documents referred to. Most topics would benefit from some more 'local flavour' adding. Some specific examples set out below: .Biodiversity- there is no discussion / interpretation of the existing interaction of YW assets and habitats (co-location of upland protected habitats and numerous storage reservoirs to the west of the study area for example).	The baseline section is high level given the strategic nature of the assessment, and it is not intended to cover a full review of specific local issues, but rather provide a review of key issues to inform the objective setting.
Environment Agency - NEAS	Some of the scoped in subtopics seem tenuous, for example linking human health to supply of water – it is relevant but is it a major issue in the UK or for the study area. The inclusion of these 'easy wins' in an assessment will distort the performance of the options, and may not facilitate much identification of better/worse options.	In order that all key potential effects for a wide range of options (noting some options are not yet defined) are captured by the assessment it is necessary to include appraisal against the wide range of topics set out in the SEA Regulation and ODP guidance. However within these topics the scope of this assessment is then defined by the objectives and indicator questions which are set out in the scoping report.
Environment Agency - NEAS	There is significant discussion of employment and economy, but no objective, if it's not influenced by the plan it would be better to make this clear and cut the section down. Same with resource use, there is just a lot of baseline that isn't obviously linked to anything WRMP related.	As above, the review of baseline identifies key issues for consideration in the WRMP, which is required to be wide ranging given the options to be assessed are not defined.
Environment Agency - NEAS	The key issues presented at the end of each topic are mostly good, but don't always reflect the baseline information that is set out.	As noted the identification of key issues must be made at a high level, strategic level so may not always incorporate all issues within each topic. We have undertaken a review of this section and will ensure the text presented in the Environmental Report is as consistent as possible.
Environment Agency - NEAS	Soil and geology is the best section, it sets out a good narrative on the baseline characteristics.	Noted with thanks.
Environment Agency - NEAS	Assessment objectives: There is a good mix of protection and enhancement type objectives. However, a few objectives seem like they will be the same score for all options, e.g. promoting efficient water use – would be worth a sense check to consider if any objectives are potentially delivered by all water resource plan options – such objectives don't help identify differences between options so are less valuable in assessing alternatives.	Given the wide range of potential options within the WRMP it is important to ensure the SEA will capture the key significant effects of each type of option. With regards to water efficiency, demand management options are likely to feature as significant for this objective, whereas resource options may not.
Environment Agency - NEAS	It would be good to set out the potential data sources (for assessment of options and future monitoring needs) – this might help identify any potentially 'problematic' objectives or sub questions	The environmental assessment will identify objectives for which uncertainty surrounds the outcome and should options be progressed towards detailed planning then the requirement for additional information studies and monitoring would need to be identified.
Environment Agency - NEAS	The EIA style matrix being suggested to define the major/minor aspect of the impacts (pp62) suggests that the assessment will be more quantitative that will be realistically achieved. Perhaps just stick with Table 5.2 only.	Table 5.2 is the proposed output for the assessment of each option. However this will requires consideration, in line with the SEA Regulations Schedule 1, of the magnitude of effects and the value/sensitivity of each receptor.

Table A.2 WReN Scoping Report Statutory Consultee Responses

WReN Regional Plan - Environmental Assessment Scoping Report Consultation Comment Log

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	1.1 Background and Context	2	4	As the region has a surplus of water	Assumed - not fully modeled 1:500 and done multi-sector demand forecast	The text, to be presented in the Environmental Report, has been amended to reflect this forecast outcome is currently assumed.
Environment Agency	1.1 Background and Context	4	1	This Scoping Report sets out the approach to the environmental assessment of the Regional Plan.	expect to see how this then aligns to wrmp SEA and option/decision making	The approach set out in this document is in full alignment with the individual company proposed assessment approach e.g. see YW WRMP SEA Scoping Report, which will ensure no duplication of effort.
Environment Agency	1.1 Background and Context	6	4	The Scoping Report describes the current and future environmental baseline within the geographical area that could be affected by the Regional Plan	a quick search indicates no reference to Idle & Torne catchment. So I am not sure if this does properly reflect the geographical area?	The report reviews the baseline of the entire WReN region as appropriate for this strategic assessment, and does not provide a detailed analysis by catchment.
Environment Agency	1.1 Background and Context	6	7	In particular, the environmental baseline and key issues set out in this Scoping Report inform the development of SEA objectives that will form the basis of the SEA of the Regional Plan.	which is built, bottom up from WRMPs. Which need an SEA potentially - though not always for NWL. So need to see how the application of a regional SEA satisfies the needs of a WRMP SEA if it is applicable?	Where relevant, water companies will produce their own SEA of WRMPs as per the statutory requirement. The approach to be followed by Yorkshire Water is set out in the April 2021 SEA Scoping Report. Northumbrian Water will also ensure a consistent approach.
Environment Agency	1.2 Consultation	1	2	There will be two key opportunities for consultation on the Regional Plan environmental assessments: firstly, at this Scoping Stage and secondly, on publication of the draft Regional Plan in early 2022 which will be accompanied by the associated assessment reports.	based on the January consultation being informal, how does this align to the 'formal' consultation (Aug 22) as well as the consultation on WRMPs? Need to be able to see a clear line of sight through the review.	The consultation on the SEA Environmental Report and other environmental assessment documentation will align with the consultation on the draft Regional Plan which will adhere to the timetable required by the WRPG i.e. draft for informal consultation in Jan 22 and formal draft August 22. Updates to the SEA and other environmental assessments between the informal and formal consultation will be dependant on consultation feedback at the earlier stage, and revised draft assessments will be published for formal consultation. The draft/revised draft Environmental Report will also incorporate the Scoping Report comment log and responses (this log) which details how changes have been made following scoping consultation. The Environmental Report will include the full methodology section and will highlight any key changes to the methodology which may be made throughout the process.
Environment Agency	1.2 Consultation			EA Summary Letter	Section 1.2 suggests the next stage where consultation might occur – with August 2022 being the next opportunity. The consultation on the regional plan in early 2022 would be a useful time to update on how the method has informed the plan and whether any proposed revisions might be required. To ensure a transparent narrative. Also noted Section 8 Next Steps details a report to be issued in early 2022. Would help to define the assorted stages in this process and resultant products to then align to where input is needed	As above.

WReN Regional Plan - Environmental Assessment Scoping Report Consultation Comment Log

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	2.1 Background and Purpose	1	1	WReN is designed to oversee water resources planning for Yorkshire and the North East of England	Bit unsure about this. Need to be clear it's about water users and environment. WReN helping inform future needs in strategic way.	We agree it is important to be clear that the Regional Plan needs to consider issues wider than water company water resources planning and we consider the following paragraph in Section 2.1 makes this clear.
Environment Agency	2.3 Relevant Guidance	3	1	Environment Agency (2021) Water resources planning guideline, draft for consultation, Mach 2021. Available at https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline referrring to "The decision making process for determining WReN solutions to regional and national needs will be developed following the Environment Agency Water Resource Planning Guidelines (WRPG) 4" in the text	worth noting that this was published after the final WRPG was produced. In which case we would need to be satisfied that the new content and links to regional planning that are embedded in WRPG are properly carried through into this scoping. Mach - should be March but the final WRPG was published and circulated in February 2021 - so wonder if this reference is correct?	The Scoping Report was published in April 2021 following publication of the (Feb) March final WRPG and integrated the requirements of the final guidance. We note that the final WRPG was circulated to water companies in February 2021, but the version published on gov.uk at that time was dated March 2021, so this later date was used for reference. The 'draft for consultation' was a carryover from an earlier draft of the Scoping Report, and was therefore an error within the footnote and will be removed.
Environment Agency	2.3 Relevant Guidance	Table 2.1		EA Summary Letter	The document references a ‘draft for consultation, March 2021’ water resource planning guideline. This was the final planning guideline. The report needs to make clear it has looked at the correct version of the guidance and is compliant with the content.	As above.
Environment Agency	3 Policy Context	Table 3.1	Line 3	Biodiversity, Flora and Fauna - To achieve favourable condition for priority habitats and species in particular designated sites.	will be of particular interest in terms of Derwent abstractions along with the in combination Humber impacts and wider no deterioration context.	Noted.
Environment Agency	3 Policy Context	Table 3.1	Water -Line 14	Water - Reduce risk of flooding by changing operation of reservoirs	Interesting the objective is reduce risk of flooding by changing reservoir operation. To tie back to the letter from YWS to Defra Then need to understand what this means as an SEA objective.	Table 3.1 sets out Key Messages and Objective from the plan and policy review i.e. a summary the messages/objectives of the plans/polices reviewed. The SEA objectives are set out in Section 5. Appraisal of any flood risk benefit would be included under the relevant SEA objective 'To reduce and manage flood risk, taking climate change into account'.
Environment Agency	3 Policy Context	Table 3.1	Soil, Geoglogy and Land use - Line 1	Soil, Geology and Land use - Protect and enhance the quality and diversity of geology (including geological SSSIs) and soils, including geomorphology and geomorphological processes which can be lost or damaged by insensitive development.	Direct link to the work around Idle & Torne? Chalk?	The table provides a summary of key messages and objectives from the review of all plans, policy and programmes and therefore specific/local messages are not included.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	3 Policy Context	Table 3.1		EA Summary Letter	Table 3.1 defines key policy objectives including 'To achieve favourable condition for priority habitats and species in particular designated site'. Are the 'particular' catchments clearly identified? If considering the WReN publications elsewhere, the proposal is to not change the River Derwent abstractions. It will need to be clear how this would be assessed via this methodology and/or whether that decision is made ahead of any environmental assessment.	The sentence refers to attainment of favourable status for those sites which are not currently favourable as an overarching objective of relevant policies. The SEA will provide a strategic assessment of all feasible options in the Regional Plan which will include consideration of any new/revised abstractions should they be relevant. Further detailed assessment of other abstraction issues are outside of the scope of the current assessment.
Historic England	3 Policy Context				We welcome the comprehensive list of policies, plans and programmes reviewed in Appendix A and the key messages derived from the review in Table 3.1. However, we recommend that you also include consideration of the following documents: <u>Local</u> - Local Plans (only two local plans across the area are included) - Heritage/Conservation Strategies - Conservation Area Character Appraisals and Management Plans	We have reviewed further Local Plans, and Heritage Conservation Strategies, and Conservation Area Character Appraisals/Management Plans, and have updated Appendix A, to be presented in the Environmental Report, to include a summary of this additional review.
Historic England	3 Policy Context	Table 3.1	SEA topic - Archaeology and cultural heritage		Table 3.1 is welcomed. Within the Archaeology and Cultural Heritage section, it would be helpful to reference 'historical and cultural assets' as 'heritage assets' to more closely reflect National Planning Policy Framework (NPPF) wording, similar to the fifth bullet point. Heritage assets should encompass both designated and non-designated heritage assets.	Wording in the last bullet has been updated to 'historical and cultural assets' rather than heritage assets. Both designated and non-designated assets will be considered through the assessment, including potential effects on unknown assets.
Environment Agency	4.1 Environmental Baseline Review Introduction	2	2	Baseline data have been drawn from a variety of sources, including a number of the plans, policies and programmes reviewed and summarised earlier in Table 3.1 and Appendix A	True - and suspect that the origin is fine, but, we don't have a list of the plans/policies/programmes or the screening tool to get to the 'relevant' nor any indication of the origin of the policy aims to see whether this is done in a comprehensive way. Will need to assess Appendix A - ideally getting NEAS to review that section.	Table 3.1 summarises the detailed review of plans and policies which are presented in Appendix A which includes a brief summary of the policy/plan/programme aims and likely influence on the Regional Plan/SEA. There is no formal screening tool for such a process that we are aware of- if further relevant plans and policies are identified by stakeholders they will be added as appropriate.
Environment Agency	4.1.1 imitations of the data and assumptions made	2	5	Spatial data have been obtained for most of the SEA topics, and the baseline is presented graphically as mapped information where appropriate. In some instances, reporting cycles mean that available information is dated.	but may be updated as going through the process - how is this incorporated	The next reporting stage of the SEA process is the preparation of an Environmental Report. Where appropriate, updates will be reflected in that document. The option-level and plan-level assessments will be made on the basis of the information available at the time of the assessments.

WReN Regional Plan - Environmental Assessment Scoping Report Consultation Comment Log

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	4.1.1 imitations of the data and assumptions made	3	2	Data have generally been sourced from national or regional bodies where information is collected for the Yorkshire and North East region using consistent methods. This allows for a more effective comparison between the regional and national averages; however, reliance on these data sets has in some cases meant that information is a number of years old.	lots of open source data out there - so would be interesting to understand what data there is and whether the 'old data' represents a risk to the effectiveness of the SEA or not.	The data is presented in the sections that follow and fully referenced which provides clarity on the age of the data. We don't consider the data has limited the overall effectiveness of the review process, which has been restricted to currently available data.
Historic England	4.10.1 Landscape and Visual Amenity - Baseline				In terms of the Landscape and Visual Amenity section of the baseline, it should be understood that there is a historic character to the wider landscape and that the historic environment needs to be considered as part of a holistic whole; i.e. when considering landscape there should be a recognition that areas under consideration are also cultural landscapes.	The baseline section, to be presented in the Environmental Report, will be updated to clarify importance of the historical and cultural landscape aspects. However to avoid double counting of effects on the historic environment, the assessment documents impacts on landscape and cultural heritage separately.
Environment Agency	4.2 Overview of Region	1	2	The WReN region encompasses a varied landscape, from the Peak District National Park in the South West, stretching to the Northumberland National Park in the Scottish borders and the North Sea coastline along the Eastern side of the region.	WReN shouldn't be in Scotland...just amend the wording a little.	The wording will be updated to clarify that WReN does not include any part of Scotland.
Environment Agency	4.2 Overview of Region	1	5	Annual average rainfall across the region varies; highest near the Yorkshire Dales, whilst low lying areas average less than half the volume of rainfall each year, with little seasonal variation.	and some coastal areas being particularly dry? Thinking feedback on Berwick in particular here.	The section, to be presented in the Environmental Report, will be updated report to include reference to some dry low lying coastal areas (e.g. Berwick-upon-Tweed)
Environment Agency	4.2.1 Yorkshire and the Humber	1	1	Yorkshire Water supplies the region of Yorkshire and the Humber.	within - as arguably Humber is a greater geography than that which YWS operates.	The section, to be presented in the Environmental Report, will be updated to clarify the supply area is within Yorkshire and Humber
Environment Agency	4.2.1 Yorkshire and the Humber	1	4	Reservoirs located in the Pennines and the valleys of the River Don, Aire, Wharfe, Calder, Nidd and Colne provide the largest upland sources of water in the region. The Yorkshire Water region is divided into two water resource zones;	spatial references to 'region' then YW region' are confusing - especially as the initial statement is clearly not correct for the 'region' as ignoring Cow Green and Kielder - would avoid calling it 'region'.	We will remove the word 'region'
Environment Agency	4.3.1 Biodiversity, Fauna and Flora - Baseline	2	2	Table 4.2 provides numbers of Sites of Special Scientific Interest (SSSI)14 (these are also shown on Figure B1) and National Nature Reserves (NNRs)15 within each WRZ in Yorkshire Water's supply area.	is there a corresponding value for the NWL geography or is this referencing the wrong regional scale? As the heading of the table doesn't distinguish this may not mean fully covering region?	This was an error in the text, as Table 4.2 sets out sites within the WReN region in all relevant water company WRZs. The text will be updated.
Environment Agency	4.3.1 Biodiversity, Fauna and Flora - Baseline	Table 4.1	7 - Humber Estaury	SPA - Humber Estuary	Maybe accurate but this might be worth an asterisk as the site will need assessing in combination with other reigonal groups as part of wider understanding of the operational changes - greater abstraction, more transfers or effluent re-use could change Humber flows	Noted. However, the table establishes the baseline site designations and not the in combination scope in this section of the report.
Environment Agency	4.3.1 Biodiversity, Fauna and Flora - Baseline	Table 4.1		SAC - River Derwent	Many R derwent exist - may help to add (Yorkshire) to avoid any confusion. (Though recognise it is flagged as Grid).	Report will be updated accordingly.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	4.3.1 Biodiversity, Fauna and Flora - Baseline	Table 4.1		Ramsar - Northumbria Coast	May again be accurate but noted that the SAC/SPA definitions has North Northumberland Coast exclusively in Berwick RZ. Clear on the boundary conditions?	Table 4.3, to be presented in the Environmental Report, will be been updated to show the North Northumberland Coastal Plain is also located in the Kielder WRZ.
Environment Agency	4.3.1 Biodiversity, Fauna and Flora - Baseline	Table 4.3	Natural Area - North York Moors and Hills	WRZ - Grid; East SW, East GW	clearly from an old source as YW integrated the East SW zone into the Grid. Therefore inconsistent with rest of document in terms of the defining RZs.	This will be updated
Environment Agency	4.3.1 Biodiversity, Fauna and Flora - Baseline	Table 4.3	Natural Area - Humber Easturary	Region - Yorkshire	again odd that some landscapes are attributed to geography wider than just 'Yorkshire' (e.g. Lancashire Plains) yet the Humber is not referenced in this way. There will be a lot of dependencies.	The table will be updated to also include Lincolnshire
Environment Agency	4.4.1.1 Population and Human Health - Baseline - Population	1	2	The WReN area includes both centres of densely populated urban areas within a generally more sparsely populated wider area. Major conurbations within the WReN area include Bradford, Durham, Kingston upon Hull, Leeds, Newcastle upon Tyne, Ripon, Sheffield, Sunderland, Wakefield and York.	Might suggest adding one or both of Middlesbrough and Hartlepool - especially the latter as a distinct WRZ in the region.	Middlesbrough and Hartlepool to be added to report
Environment Agency	4.4.1.1 Population and Human Health - Baseline - Population	2	1	The total population (2019) of the North East region is estimated to be 2.7 million and for Yorkshire and the Humber is 5.5 million.	really not clear - as cover NE region and Y&H - would suggest customers served, which based on WRMP19 published plans was assessed as xx million.	Report to be updated to include customers served for NWL and YWS
Environment Agency	4.4.1.1 Population and Human Health - Baseline - Population	3	1	As shown in Table 4.4, population growth in Yorkshire and the Humber and the North East of England is anticipated to be slower than the average rate throughout England.	but as we have seen through 2020/21 due to the Covid pandemic, the ability to work remotely means some people moving further away from London - se we may see a greater population in the connected urban and rural landscapes in the North? Area of uncertainty.	Report to be updated to address the uncertainty in population demographics
Environment Agency	4.3.1 Biodiversity, Fauna and Flora - Baseline	Table 4.3	Humber Estuary		again odd that some landscapes are attributed to geography wider than just 'Yorkshire' (e.g. Lancashire Plains) yet the Humber is not referenced in this way. There will be a lot of dependencies.	We note that impacts from outside the region could influence the Humber estuary, however the table references the geographical region in which the site sits.
Environment Agency	4.4.1.1 Population and Human Health - Baseline - Population	Table 4.4	Heading - Population change over 10 years	Values for population change over 10 years	Why are these figures rounded if the subsequent table breaks down into detail and are not rounded?	The Office for National Statistics presented these exact figures and are responsible for rounding these figures.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	4.4.1.1 Population and Human Health - Baseline - Population	4	5	Population change is the function of natural change (difference between births and deaths) and net migration (the difference between the number of people moving into and out of an area). The balance of factors underlying population change varies by region. Table 4.5 below presents the projected population change throughout Yorkshire and the Humber and the North East of England, from 2018 to 2028. The relatively low percentage population change in the North East can partially be attributed to the anticipated negative natural change. In Yorkshire and the Humber there is a predicted to be a large contribution to population change from international migration.	not really seeing anything in terms of levelling up agenda and whether there could be am impact in terms of growth. While I don't think I would expect WReN to know this detail, the policy could usefully be acknowledged. Combined with free ports and growth of hydrogen economy in region and possibly wind/green generation may see more growth/investment. Is this adequately covered?	The data presented are based on available ONS data as a full demographic analysis of the different factors affecting population growth in the region is beyond the scope of the SEA.
Environment Agency	4.4.1.3 Economy and Employment	4	5	The COVID-19 pandemic has impacted the economy in numerous ways; from lockdown restrictions forcing the closure of businesses to limits on mobility. In 2020 UK Gross Domestic Product (GDP) fell by 9.8%, the steepest decline since consistent records began in 194827 . Economists differ in how quickly they expect the economy to recover, however average forecast is for GDP growth of 4.8% in 2021. When the economic shock of the pandemic does dissipate it is likely that the crisis will result in lasting damage to the economy.	premised on what evidence? Other policies may well offset this in some parts of region.	Additional text to be included in the Environmental Report to summarise the 'Levelling Up' programmes in response to the pandemic.
Environment Agency	4.4.1.4 Recreaction and Tourism	1	4	There are a variety of opportunities for recreation and tourism within the study area. Many of the recreational and cultural offerings are represented in other topic areas in the baseline. For example, the region includes a number of water resources of recreational importance including many reservoirs for sailing or fishing and river sections of particular importance with respect to navigation and angling.	and inland bathing water designation at Ilkley!	Inland bathing waters to be added to section, to be presented in the Environmental Report
Environment Agency	4.4.1.4 Recreaction and Tourism	1	7	Section 4.8 identifies the importance of the study area with respect to heritage assets, including four internationally recognised World Heritage Sites, 183 Registered Parks and Gardens and 3,998 Scheduled.	Ancient Monuments or something else?	Section, to be presented in the Environmental Report, to be updated to add 'Monuments'.
Environment Agency	4.4.2 Future Baseline	1	1	Population is expected to grow at a rate between 2.3% and 3.6% across the region (see Table 4.5), with an increasing proportion of people at or above state pension age.	in the respective component company areas - could this not average out to a regional growth of x% weighted according to population?	ONS has provided rounded figures so the regional growth of x% cannot be accurately calculated. Report text to be clarified to show growth for the Yorkshire and the Humber area, and the North East area.
Environment Agency	4.4.3 Key Issues	1	Point 4	The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures.	didn't really feel that came out in any of the preceding text.	Agreed, this will be removed.

WReN Regional Plan - Environmental Assessment Scoping Report Consultation Comment Log

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	4.5.1.1 Material Assets and Resource Use - Baseline - Water Use	Northumbrian Water - 1	3	Northumbrian Water supplies on average 680Ml/d of potable water and 80Ml/d of untreated water to customers across the North East. In 2018/19 Northumbrian Water's rates of leakage were 136.3Ml/d	20.04% (potable) - ((note the % comment in Yorkshire comment (4.5.1.1 Material Assets and Resource Use - Baseline - Water Use)))	Percentage of leakage from water abstracted and treated to be included in the baseline section, to be presented in the Environmental Report.
Environment Agency	4.5.1.1 Material Assets and Resource Use - Baseline - Water Use	Hartepool Water - 1	2	Hartlepool Water supplies on average 37Ml/d to customers in the Hartlepool area (38). In 2018/19 rates of leakage were 4.59Ml/d	12.4% - ((note the % comment in Yorkshire comment (4.5.1.1 Material Assets and Resource Use - Baseline - Water Use)))	As above.
Environment Agency	4.5.1.1 Material Assets and Resource Use - Baseline - Water Use	Yorkshire - 1	2	In 2018/19, Yorkshire Water abstracted and treated 1,300Ml/d (million litres per day) of water for supply to customers, with leakage from the water distribution system reported as 289.8Ml/d	(22.28%). Total leakage = 21.35% of all its leakage (298.8 +136.3+4.59)/(1300+680+37). Would be helpful to put in as percentage figures and I also think there is value in presenting the aggregated figures.	As above.
Environment Agency	4.5.1.1 Material Assets and Resource Use - Baseline - Water Use - Yorkshire	1	1	In 2018/19, Yorkshire Water abstracted and treated 1,300Ml/d (million litres per day) of water for supply	On Average?	Yes, on average. The text, to be presented in the Environmental Report, will be amended clarify this.
Environment Agency	4.5.1.2 Resource use and Waste	3	2	The Yorkshire and The Humber region is a major producer and consumer of energy. Total energy consumption in the region during 2017 was just over 12 million tonnes of oil (mtoe)	equivalent?	Report to be updated with equivalent
Environment Agency	4.5.1.2 Resource use and Waste	3	5	Table 4.7 illustrates the proportion of energy consumption in both the North East and Yorkshire regions used for industry and commercial use is above the UK average. Energy consumption by type is consistent with national trends, with the majority coming from natural gas and petroleum. The renewable energy sector in both regions continues to grow with 11% of sites generating renewable energy in England (including offshore sources) located in Yorkshire and the Humber.	WReN aware of work on hydrogen - will this be material to region?	The Future Baseline section, to be presented in the Environmental Report, to be updated to incorporate further information on hydrogen power station in Humber Estuary and wind turbines at Dogger Bank.
Environment Agency	4.6 Water			EA Summary Letter	Whether adequate coverage has been made of bathing waters and water quality aspects. In particular in reference to recent developments for inland waters receiving designation and how this will be accounted for.	Further text to be added to river basin management challenges to address this issue, to be presented in the Environmental Report.
Environment Agency	4.6.1 Water - Baseline	1	3	The WReN region is made up of the Humber river basin district and the Northumbria river basin district.	part of?	To be updated in the Environmental Report.
Environment Agency	4.6.1.1 Water Quality	Table 4.8	* note under table	*The Humber river basin district covers 26,100km2 and includes a significant area beyond the WReN study area.	do we have the figures for just the WReN geography?	If further data is available and can be provided it will be incorporated as appropriate.

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Environment Agency	4.6.1.1 Water Quality	Table 4.10	Table title	Chemical and quantitative 2015 classification for groundwaters in the Humber river basin district	will any attempt be made to update these with pending classification data updates?	The baseline section will be updated for the Environmental Report where significant changes have occurred, and if the RBMP3 data is available it will be incorporated at that stage.
Environment Agency	4.6.1.1 Water Quality	River basin management changes - 1	4	In the Northumbria river basin district the most common threat to water quality were physical modifications and pollution from chemicals. For the Humber river basin district pollution from rural areas posed the greatest threat to waterbodies achieving good status.	phosphate?	Text to be updated in the Environmental Report,
Environment Agency	4.6.1.2 Flood Risk	1	1	Flooding can result from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.	arguably from groundwaters and surface water too...	Wording to be updated in the Environmental Report.
Environment Agency	4.6.1.2 Flood Risk	Northumbria river basin district - 1	3	The Northumbrian river basin comprises of the following; Northumberland rivers management catchment, River Type management catchment, and the River Wear and River Tees management catchments.	River Tyne	This section, to be presented in the Environmental Report, to be updated accordingly.
Environment Agency	4.6.1.2 Flood Risk	Humber river basin district	Paragraph title	Humber river basin district	really would help to understand whether this is WReN geography or the full river basin district. The narrative really hasn't made that clear.	Both river basin district sections refer to the full river basin districts, as this is the level at which data is available.
Environment Agency	4.6.1.2 Flood Risk	Humber river basin district - 2	6	The coastline is prone to erosion from the sea along its entire length and in north Lincolnshire, sand dune systems and coastal have to be defended to prevent inland areas from flooding.	Not in WReN boundary?	Reference to Lincolnshire to be removed since this is located outside the WReN area
Environment Agency	4.6.1.2 Flood Risk	Humber river basin district - 3	4	Flooding from culverted rivers (rivers that have been redirected underground through tunnels) can be a large problem in the Humber.	no reference to rapid response catchments or reservoirs for flood storage which occurs in both Humber and Northumbria and may be something to further adopt.	Paragraph 3, line 1 and paragraph 6, line 1 refers to rapid response catchments for each river basin district. Flood storage areas and reservoirs to be added to the section, to be presented in the Environmental Report.
Environment Agency	4.6.1.2 Flood Risk			EA Summary Letter	References also made to reducing risk of flooding. But not a lot of detail how that will be supported. Section 4.6.1.2 mentions flood risk and schemes. It would be expected that environmental assessment (and the wider regional plan) would be an enabler in managing flood risk e.g. through shared planning/investment. Ensure adequately cover rapid response catchments and also reservoirs use for flood storage – as done by NWL and YWS already.	The SEA is a high level assessment and incorporates a strategic assessment of flood risk via the relevant objective in the Water topic. The WReN member water companies will continue to work with partners on managing flood risk via their ongoing operations.
Environment Agency	4.6.1.3 Resource availability	1	3	Based on previous WRMP data it was found that all WRZs were in surplus.	but recognise this is Water Co only?	Text to be amended to clarify this.

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Environment Agency	4.6.1.3 Resource availability	Table 4.15	Table heading	Change in status at Feb 2021	to check. The status alluded to reducing surpluses in NWL RZs which would arguably be classed as deteriorating surplus. But still unlikely to be a risk (except in B&F RZ). Hartlepool also considering a transfer in. Not sure whether I believe this assessment currently.	This data is derived from the Revised Resource Position Statement which was issued for consultation in February 2021. Any changes to this position following future analysis will be reflected in the Environmental Report.
Environment Agency	4.6.2.2 Future baseline - water quality - Flood risk	2	15	For the WReN region, the following CFMPs have been produced: Grimsby and Ancholme	Not in WReN	Grimsby and Ancholme to be removed
Environment Agency	4.6.2.2 Future baseline - water quality - Flood risk	2	17	For the WReN region, the following CFMPs have been produced: Louth Coastal	Not in WReN	Louth Coastal to be removed
Environment Agency	4.6.2.2 Future baseline - water quality - Flood risk	2	19	For the WReN region, the following CFMPs have been produced: River Trent	Need to define that not all of Trent is in WReN - it is in the Humber River Basin. Trent largely considered via ACWG and more relevant to other Regional plans.	This section, to be presented in the Environmental Report, will be updated.
Environment Agency	4.7.1.1 Baseline - Geology	4	1	The variety of underlying geology in the region is reflected in the region's soils, the agricultural value of which varies across the region.	wonder whether previous reference to WFD quantitative and quality status should be teased out here. There's also a major omission in so far as there is limited specific reference made to the Sherwood Sandstone Wellfield. This is relevant as there are regional options being considered. A lot of the document is definitely scene setting - not sure what the 'scope' is currently. Also environmental destination work referenced which could impact B&F RZ availability linked to Fell Sandstone.	The section, to be presented in the Environmental Report, will be updated to include further reference to the Sherwood Sandstone. Also note that the scope of the assessment is set out in Section 5 - Section 4 provides a review of baseline conditions within the area of relevance to the assessment in order to inform the key issues to be addressed in the assessment. A detailed review of all regional issues is outside of the scope of the baseline review which is conducted to inform the development of SEA objectives of relevance to the whole plan.
Environment Agency	4.7.2 Future baseline	2	6	The first of these schemes, the Sustainable Farming Incentive, will pay farmers to manage their land in an environmentally sustainable way	very little on agriculture - distribution, type, water use and future demands. Link to position statement, contribution to environment (e.g. earlier reference to agric phosphate) or reference to things like NFU water strategy.	Further description of agricultural water use to be added to this baseline section which will be presented in the Environmental Report.
Environment Agency	4.7.2 Future baseline	2	9	The first of these schemes, the Sustainable Farming Incentive, will pay farmers to manage their land in an environmentally sustainable way. The scheme designates standards based on a feature e.g. hedgerows or grassland, and contains a series of actions required to meet the criteria. The scheme is currently being piloted but is due to launch in 2022	any within the region?	The pilot is nationwide, with exact locations per region not yet known.

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Environment Agency	4.8.1.1 Air and Climate - Basline - Local Air Quality	1	1	Options in the Regional Plan may require increased pumping of water (carbon emissions) and the construction of new infrastructure. Therefore, there is the potential for negative effects on air quality through emissions associated with construction requirements or through the operation of the options.	need to have in context of industry commitments towards net zero and UK Government policy on net zero. So whether will be a 'real' change in carbon and air quality as consequence.	The section will be updated with additional detail regarding government and industry commitments. We note that net effects of new development are uncertain in this context however the report highlights that there is 'potential' for negative effects.
Environment Agency	4.8.1.2 Cimate	Table 4.17	Flood Management - Impact	Increased riverine flood risk and storm occurrence due to increased rainfall, leading to increased risk of flooding to water resource assets and adverse temporary effects on raw water quality	and supporting infrastructure e.g. power.	This section, to be presented in the Environmental Report, will be updated accordingly
Environment Agency	4.8.2 Future Baseline	2	2	The CCRA considered more than 700 risks and selected 100 risks for detailed review. A selection of threats and opportunities identified under the 'medium scenario' are summarised in Figure 4.1	that's great but 'so what'? Why these 100? Are these specifically relevant to WReN? If so, might be a good idea to explain why these 100 are applicable or, whether the 700 risks would need to be factored into options/plan/decision making. Particularly whether stated risks such was WA5 and reduced water availability relates to WReN (or as per earlier in this document, just YWS) for example and WA8 in terms of unsustainable abstraction. Also noting this is medium scenario - therefore there will be sensitivity to these components in low/high scenarios - does this have any bearing on the 'pressures' specific to WReN? In effect, what is the baseline vulnerability assessment?	A detailed vulnerability assessment is outside the scope of an SEA. The data presented provides a high level overview of the likely changes in the baseline in the future. Detailed consideration of likely future climate change/water resource scenarios are included as part of the supply forecast workstream.
Environment Agency	4.8.3 Key Issues	1	Point 3	The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities of climate change.	is this demand management?	This would include demand management
Historic England	4.9.1 Archaeology and Cultural Hertiage - Baseline				In terms of baseline information contained in the Archaeology and Cultural Heritage Section we welcome that all designated heritage assets (Conservation Areas, Listed Buildings, Scheduled Monuments, Registered Parks and Gardens, Registered Battlefields, and Protected Wrecks) within the area are identified in Table 4.18. We also welcome the inclusion of information on the number and type of heritage assets identified on the Heritage at Risk register within the Regional Plan area. However, please ensure that you also refer to the settings of heritage assets throughout the report.	This section, to be presented in the Environmental Report, will be updated to clarify that the heritage site/asset and also setting both need consideration

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Historic England	4.9.1 Archaeology and Cultural Hertiage - Baseline				We would expect non-designated heritage assets to be identified. These include, but are not confined to, locally listed buildings and buried archaeological sites. It should be noted that non-designated archaeological remains can be of demonstrable equivalent significance to designated heritage assets of national importance (NNPF, footnote 63). Please include these in the Scoping Report and the assessment.	We will consider non-designated assets and include details for these where information is available.
Historic England	4.9.1 Archaeology and Cultural Hertiage - Baseline				In addition to the above, we would expect reference to currently unknown heritage assets, particularly sites of historic and archaeological interest. Given the size of the study area there will definitely be unidentified heritage assets and archaeological remains. The unidentified heritage assets of the Region should be acknowledged and outlined in this section. It is important to note that previously unknown undesignated assets have the potential to be of national significance, on a similar level to that of a scheduled monument. Unknown heritage assets should also be referenced within this section. Whilst difficult to scope there should be an awareness that, given the large geographical area covered by the scoping, these will exist and will potentially be impacted.	We will update the section, to be presented in the Environmental Report, to reference there may be potential impacts to unknown assets, and this needs to be considered. We will also update the indicator questions for the cultural heritage topic to include consideration of potential impacts to unknown heritage assets.
Historic England	4.9.1 Archaeology and Cultural Hertiage - Baseline				The reference to the potential for waterlogged archaeology and the sensitivity of these remains to changes in water levels is welcomed.	Noted
Environment Agency	4.9.3 Key Issues	1	Point 1	The key sustainability issue arising from the baseline assessment for archaeology and cultural heritage is: • The need to conserve or enhance sites of archaeological importance and cultural heritage interest, particularly those which are sensitive to the water environment.	of those listed as at risk, or those just listed, has a link been made to abstraction points?	No, the baseline section sets out the number of assets present in the region. Where an option has a likely effect on specific assets this will be reported in the subsequent Environmental Report.
Environment Agency	5.1 Strategic Environmental Assessment	Heading		Strategic Environmental Assessment	notable that the covering email suggested that the approach for WRMP and Regional Plan SEA are comparable yet so far there has been little or no reference to the use of SEA across regional plans and alignment to the WRMPs. It needs to be clear where the methods/approaches overlap/align or where they are bespoke with reference made in scoping to ensure it is obvious what will be contained where.	The SEA, HRA and WFD of the Regional Plan will be prepared in line with the approach set out in the Scoping Report, which as noted in Section 2 aligns with all relevant WR guidance and is consistent with the WRMP approach and that of neighbouring regions. Ongoing liaison with neighbouring regions with regards to the assessment approach will continue throughout the Regional Plan process. The water company WRMPs will be accompanied by the SEA, HRA and WFD of those plans.

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Environment Agency	4.7 Soils, Geology & Land Use	Table 5.1		EA Summary Letter	SEA topic 'Soil, geology and land use' (pg48) appears not to adequately/explicitly reference WFD classifications. This will be a significant constraint on some options proposed in regional planning.	The change as a result of an option to any catchment contribution to flow quantity/quality and water quality is captured in the Water topic.
Environment Agency	5.2 Overview of Approach	6	1	The SEA objectives and indicator questions have been developed with regard to the SRO SEA objectives set out in Table 6.1 of the ACWG Strategic Environmental Assessment: Core Objective Identification report (see Section 2.3.1).	There are currently no SROs identified within WReN. As such it would be beneficial to explain whether the consistency with this allows input into regional plan reconciliation and/or whether this enables the output to form a WRMP options.	We note there are currently no SROs in the WReN region (this is clarified in Section 2.3.1) however there is a need to provide a consistent approach to that used in neighbouring regions, who do have SROs. This is also the case for the other key workstreams feeding into the information required for the reconciliation process (e.g. Supply, Options Identification). The approach to environmental assessment for the member water company's WRMP assessments align with that presented here (e.g. see YW WRMP Scoping Report) which will facilitate the links between the Regional Plan and the WRMPs and ensure a consistent output within the assessment of options, which will then facilitate appraisal of all sets of alternative plans.
Environment Agency	5.2 Overview of Approach	Table 5.1	Heading	PPP Key messages	PPP - not defined	Abbreviation to be removed
Environment Agency	5.2 Overview of Approach	Table 5.1	PPP Key messages, biodiversity, flora and fauna-point 3	To achieve favourable condition for priority habitats and species in particular designated sites	what does this mean? Selective or, sites that meet a particular level of designation and above?	The sentence refers to attainment of favourable status for those sites which are not currently favourable as an overarching objective of relevant policies.
Environment Agency	5.2 Overview of Approach	Table 5.1	SEA Objectives - Population and human health - Point 1	To protect and improve health and well-being and promote sustainable socio economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	noting this is not just in terms of PWS access to water	Agreed.
Environment Agency	5.2 Overview of Approach	Table 5.1	Indicator Questions - Population and human health - Point 6	Will the option affect Public Rights of Way?	some of this is about the negative. I get that, but would expect SEAs to demonstrate the positive and negative impacts of options. So would need reassurance that though use such as 'affect' which could have more negative connotations, this covers benefits too.	As set out in the approach to the assessment, consideration is given to both adverse and beneficial effects throughout the process.

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Environment Agency	5.2 Overview of Approach	Table 5.1	SEA topic - Material assets and resurce use	Material assets and resource use	although may be wanting use UKWIR method, there might sensibly be additions that are reflected in other guidance e.g. natural capital is embedded in some of WRPG guidance and needs to be reflected in these SEA topics. It's also really important that we can see where the SEA at this scale then translates to the specific statutory plans.	The approach the assessment has considered the requirements of all relevant guidance. See Section 5.6 which sets out the links between the SEA and the approach to be taken for the NCA, which follows the YW Six Capitals approach to ensure transferability between the Regional Plan and WRMP assessments.
Environment Agency	5.2 Overview of Approach	Table 5.1	Indicator questions - material assets and resource use - point 1	Will it minimise the use of energy and promote energy efficiency?	should this section also reference something along the lines of will it contribute to policies on carbon reduction as mention low carbon economy. Also need to ensure demand management embedded ahead of	Please see the Air and climate section, and amendments within those key issues and indicator questions.
Environment Agency	5.2 Overview of Approach	Table 5.1	Indicator questions - material assets and resource use - point 5	Will the option affect major built assets and infrastructure, including transport infrastructure?	is the SEA for an option within a plan or the plan itself?	The process will begin with appraisal of all options and then following the development of alternative plans/solutions the plan level assessment will take place.
Environment Agency	5.2 Overview of Approach	Table 5.1	Indicator questions - water - point 4	Is the option likely to contribute to or conflict with the achievement of WFD objectives?	is WFD compliance the only objective? Key point might be other legislation. In particular for WReN, the shared Humber estuary (with WRW/WRE impacts) means an in combination assessment will be required. The assessment of options across the multiple groups needs to be consistent/aligned - especially in terms of in combination assessment. Similar to Pennines - need to ensure accountability.	This specific indicator question is included to embed consideration of WFD compliance within the SEA, as informed by the stand alone WFD assessment. An in combination assessment will be carried out when this is possible i.e. when regions have developed draft Regional Plans. See Section 5.3.2.1.
Environment Agency	5.2 Overview of Approach	Table 5.1	PPP Key messages - Soil geology and land use	Ensure that soils will be protected and managed to optimise the varied functions that soils perform for society (e.g. supporting agriculture and forestry, protecting cultural heritage, supporting biodiversity, as a platform for construction), in keeping with the principles of sustainable development.	cross reference with INNS at all? For example there is legal obligations for things such as Japanese Knot weed. Any options and operations requiring soil disposal for example may be impacted by the presence of these plants.	The Biodiversity topic includes the SEA objective in relation to INNS which will include consideration of all pathways for INNS spread.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	5.2 Overview of Approach	Table 5.1	Indicator questions - soil geology and land use	Will it avoid damage to and protect geologically important sites?	surprised that unlike 'water' there is no reference to WFD classification. e.g. Poor Status water bodies will have impact on licence use and therefore may frame the planning problem. Also note that any 'option' may have impacts on geology, its function or physically impact on it and that may have localised implications even if not a 'geologically' important site. Also expect to see some detail of how Chalk issues might be factored in - especially in terms of chalk working group advice.	The change as a result of an option to any catchment contribution to flow quantity/quality and water quality is captured in the Water topic. This would include any options affecting Chalk streams. Yorkshire Water remains committed to working with partner organisations on restoration plans for relevant Chalk catchments. The assessment of impacts of each option on geology is necessarily high level at the strategic stage and in addition, further detailed assessment of impacts on geology, including at the local level, would be required in the future for any options taken forward to the detailed planning stage.
Environment Agency	5.2 Overview of Approach	Table 5.1	Indicator questions - soil geology and land use	Will it avoid damage to and protect geologically important sites?	Shouldn't be limited to SSSIs	We agree the assessment should consider non-statutory sites (e.g. LGSs) and where this information is available it will be incorporated, however as data sets are not always readily available, the detailed consideration of non-statutory sites would be made at the detailed scheme design stage.
Environment Agency	5.2 Overview of Approach	Table 5.1	Indicator questions - Air and climate	Will it reduce or minimise air pollutant emissions?	Is there scope to put in something about net zero and industry commitments to meet net zero?	The issues and indicator questions have been amended to explicitly reference net zero.
Environment Agency	5.2 Overview of Approach	Table 5.1	PPP key messages - air and climate	Minimise energy consumption	Repetitive	Duplicate text to be removed.
Environment Agency	5.2 Overview of Approach	Table 5.1	Indicator questions - Archaeology and cultural heritage - point 2	Will abstraction alter the hydrological setting of water dependent assets?	again - much of this depends on whether looking at the 'plan' or 'option' scale. Suspect there needs to be a bit more clarity on this. For example this could be new/increased abstraction under an option or, reduced abstraction where risk of unsustainable and results in options elsewhere - may therefore get mixture of positive and negative impacts/mitigations.	As above, the SEA appraisal occurs at both option and plan level in order to inform decision making throughout the process.
Environment Agency	5.2 Overview of Approach	Table 5.1	PPP key messages - Landscape and visual amenity - point 3	Enhance the value of the countryside by protecting the natural environment for this and future generations.	option versus multi-sector plan?	The table at this point summarises key messages from relevant PPP.
Environment Agency	5.2 Overview of Approach	Table 5.1	Baseline key issues	The need to protect and improve the natural beauty of the region's AONBs and other areas of natural beauty.	a key bit will potentially be accessible green spaces - not just natural beauty spots. Cross reference with wellbeing and access.	We agree that creating/improving access to green spaces is an important consideration and this is covered in the Population and human health topic

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Historic England	5.2 Overview of Approach	Table 5.1	Archaeology and cultural heritage		Overall, we are supportive of the proposed objective and assessment approach for the historic environment set out in Table 5.1. We welcome the references to landscapes and heritage assets sensitive to changes in the water environment. It is important to consider how any changes to the hydrology may impact buried archaeological sites and the preservation conditions recorded on site, especially if there is the potential for organic remains to be preserved (artefacts and ecofacts). It is important to note that archaeology can also be present within a river. We would recommend that any cores collected through river deposits should also be assessed in terms of their archaeological potential in order to maximise the opportunities to understand the historic environment.	We agree that changes to the water environment can have potentially significant impacts on historic assets. As the SEA is a completed at high/strategic level there are no site works involved, however further investigations would occur at the detailed planning stage should options within the plan be taken to the construction planning stage.
Historic England	5.2 Overview of Approach	Table 5.1	Archaeology and cultural heritage	Currently reads: Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness?	We would however recommend splitting out the first Indicator Question into two questions as follows: - Will it avoid harm to and protect the historic environment, heritage assets and their settings? - Will it respect, maintain and strengthen historic local character and distinctiveness?	We will split this question as advised (and include reference to unknown assets, see above).
Historic England	5.2 Overview of Approach	Table 5.1	Archaeology and cultural heritage		We would also suggest the inclusion of a further additional question: - Will is contribute to the better management of heritage assets and tackle heritage at risk?	This has been added.
Historic England	5.2 Overview of Approach	Table 5.1	Archaeology and cultural heritage		The Regional Plan should not only seek to minimise and reduce harmful effects on heritage assets and their setting but should seek to avoid impacts in the first place, and mitigate only where avoidance is not possible. There may also be opportunities to enhance the historic environment.	We agree that it is important to seek to avoid impacts on heritage assets, and detailed scheme design of any options taken forward would adhere to the mitigation hierarchy, and any enhancement opportunities would be considered at that stage.
Historic England	5.2 Overview of Approach	Table 5.1	Archaeology and cultural heritage		As with our comment above, to ensure consistency with the NPPF, it would be helpful to change references to 'historical and cultural assets' to 'heritage assets'.	The instances of 'historical and cultural assets' will be replaced with heritage assets in the Environmental Report.
Historic England	5.3 Proposed Framework for Assessment				In assessing options under this framework care will need to be taken where multiple heritage assets are involved. An option may have some positive effects on some heritage assets and negative effects on others. Simply adding together the effects and concluding a neutral effect would be an unacceptable approach. It will be important to consider how you will deal with such situations.	We agree, and in order to avoid this unacceptable situation across all topics, adverse and beneficial effects are considered and reported separately.

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Historic England	5.3 Proposed Framework for Assessment				In the assessment of site-based options, it is important that due weight is given to the potential harm to the historic environment. In these cases, we would advise against a purely distance based approach. The application of a standard proximity test (e.g. is the site within a set distance of a heritage asset) should not be used as it can lead to misleading results	As the assessment is completed at a strategic level and sometimes options will potentially influence large geographic areas we do need to engage in a screening of assets. This is set at within 1km of any scheme element or within the any known zone of hydrological influence for water-dependent/paleo-archaeology sites which provides for a precautionary assessment, however consideration is also given to the nature and designation of the site/asset.
Historic England	5.3 Proposed Framework for Assessment				Impacts on significance are not just based on distance or visual impacts, and assessments require a careful judgment based on site visits and the available evidence base. We would want to see a narrative-based approach that properly considers more nuanced issues in relation to the setting and significance of both designated and non-designated heritage assets. The impact of proposals on the significance of heritage assets should be taken into consideration at an early stage.	The SEA provides a high level assessment and further detailed studies and assessment (e.g. EIA) would be required for any options which are taken forward to implementation. At that detailed design stage the detailed assessment of impacts on historic assets would be made, including any site visits and data collection.
Environment Agency	5.3.1 Primary assessment	1	3	The appraisal framework will be applied to test the performance of each of the alternative measures (Regional Plan options) against the SEA objectives. This approach will enable the environmental performance of these options to be used to inform decision-making.	based on limited options presented. With screening criteria not necessarily agreed/finalised? Assessment will need to be of each option and combinations thereof. Also important that if there is a defined need for an option and the assessment is undertaken that it aligns to the WRMP process and SEA.	All feasible options will be subject to environmental assessment and all alternative plans/solutions will be subject to environmental assessment as set out in Section 5. It is not clear what screening criteria the comment refers to? The Regional Plan and WRMP assessment approaches align, see above.
Environment Agency	5.3.1 Primary assessment	2	2	The WReN Regional Plan options may have effects outside of the WReN geographical region (see Figure 2.1), for example export options to neighbouring regional groups such as Water Resources West and/or Water Resources East.	define who 'owns' in combination assessment. How will an export be assessed? By WReN in entirety or recipient? How will each group show alignment? WRE suggested an approach for capturing some of this at RCG.	The in combination assessment of any option combinations both within the WReN Regional Plan and any relevant/required assessment with other Regional Plans will be documented in the WReN Environmental Report. Ongoing discussion between environmental assessment teams across the regional groups will ensure the approach to these assessments remains consistent.
Environment Agency	5.3.1 Primary assessment	2	7	Regional Plan the two groups will collaborate on the environmental assessment to ensure consistency in data inputs and assessment approach.	including in combination. So specific issue might be if discharges to Trent reduced as a WRW option progressed (to provide for WRSE) then any options for WReN impacting on Humber likely to have in combination impact. So while transfer not directly between the groups, external factors means need to ensure assessment against the in combination impacts with a clear lead/responsible group.	As above.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	5.3.1 Primary assessment	3	1	The assessment of options will be used to inform the selection of options for inclusion in the Regional Plan. The proposed appraisal framework table is given in Table 5.2	noted that without a full resource position statement or understanding of other sectors, this reads as a PWS option. Would need to understand the actual planning baseline and problem in the future (via the scenarios) to ensure that options available meet the required planning problem. Currently the options are iterations of previously suggested options from WRMP19 with a few additions. The SEA is focussed on the 'big' options - but there are lots of other feasible options for the WRMPs which will be dealt with in WRMP process. Assessments need to embed/align - as it would not be favourable to options/plans to have different approaches for different plans.	The approach to option identification is discussed in methodology document for the Options Identification workstream. The SEA, HRA and WFD will assess all options identified as feasible. The Regional Plan and WRMP approaches align, see above.
Environment Agency	5.3.1 Primary assessment	4	Point 2	The appraisal framework (Table 5.2) is structured as follows: The scale of the effect, which might relate to either geographical scale or the size of the population affected, is identified in the third column on a scale of small, medium to large.	Who judges these?	The assessment is made throughout on the basis of available data and professional judgement. All outputs will be subject to consultation and we welcome any feedback or comments on any aspect of the assessment.
Environment Agency	5.3.1 Primary assessment	Table 5.2 fauna topic only)	Heading	Permanence of effect (permanent/temporary)	how would you differentiate between the 'construction' phase (temporary) versus the 'permanent' option having been built? Some items will be temporary, some permanent - both with/without mitigation.	We agree that for some options there may be temporary effects on certain topics related to a construction phase and permanent effects on other topics related to operation, and these are identified as appropriate. Where both phases influence a certain topic the appropriate overall nature of permanence/temporary are identified for the key effects.
Environment Agency	5.3.1 Primary assessment	5	1	Varying levels of uncertainty are inherent within the assessment process. The assessment will minimise uncertainty through the application of expert judgement. The level of uncertainty of the option assessment for each SEA objective will be reported in the appraisal framework	In particularm where applied, this needs to be documented, clear and transparent as well as jusified	The certainty of effect is reported in the appraisal framework, see Table 5.2.
Environment Agency	5.3.1 Primary assessment	8	1	The resulting significance of effects will be considered in the prioritisation of options and programmes of options.	what's the outputs and significance? If about getting agreement/sign-off for a decision from members outside the core PWS members, there needs to be confidence that the assessment is sensible. I would appreciate better explanation of how an option specific impact/mitigation can be considered/offset against a regional plan? As ever scale is important - an option might be ruled out as mitigation not enough but, if considered in the round of regional plan and benefits achieved elsewhere it might be a viable option.	The outputs and any description of significance needs to be clear and sensible in order to inform the option appraisal process and any decision making. Outputs will be produced as outlined in Section 5. Further details of the option appraisal process can be found in the Option Appraisal workstream methodology document.

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Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	5.3.1 Primary assessment	Figure 5.1			the arguments are going to be around how seriously the EA and WReN each regard any given issue - it is all shades of opinion - Tees transfer scaled up…	We consider that the consultation process should provide for an informed and constructive discussion about any issues raised by stakeholders and/or regulators with the draft assessment presented by WReN.
Environment Agency	5.3.1 Primary assessment	Figure 5.1		Spelling of "Dependant"	Dependent	To be corrected in the Environmental Report.
Environment Agency	5.3.1 Primary assessment			EA Summary Letter	Section 5.3.1 defines process of testing regional options versus regional plan environmental assessment to inform decision making. Several of these options were derived from plans previously subject to SEA. It would be useful to understand the additional value being added and the differences in the approaches. It would also be useful to understand how an in isolation assessment builds to an in combination assessment. I would also be helpful to understand how the assessment will support the development of an environmental destination rather than just defining options (i.e. supporting development of achieving environmental destination).	The approach taken within the WReN environmental assessment will remain consistent with previous WRMP assessments as is appropriate and where this remains compliant with all relevant guidance. Where appropriate the existing assessments will be updated to reflect alterations to options and new requirements within the assessment process (e.g. net gain). The assessment of an in combination scenario is informed by the option level assessments, however this is a bespoke assessment which cannot consider a simple addition of all effects.
Environment Agency	5.3.1.1 General Significance Definitions	Heading		General Significance Definitions	definitions	To be corrected in the Environmental Report.
Environment Agency	5.3.1.2 Summarising the effects assessment	1	4	An example of the proposed VE matrix is given in Table 5.3	Kind of see this as sensible presentation - but how are the net benefits versus adverse impacts assessed overall? How would a user see what option is better than another and, if the same objectives have comparative positive/adverse impacts how would they assess these? Also where does the question of permanence come into this?	Table 5.3 provides an illustration of how information is summarised to provided an overview of all option assessment outcomes. However the outcomes for each option will be presented in a detailed table as described in Table 5.2 which sets out all components of the appraisal, including permanence.
Environment Agency	5.3.2.1 Programme and Regional Plan level cumulative effects assessmen			EA Summary Letter	Section 5.3.2.1 should focus on the reconciliation processes in Autumn 2021. Particularly as the assessment of a 'regional' plan could differ to the demands placed on a region by another region. So a 'preferred' local plan could be assessed but a strategic option suggested by another region as being required. Need to ensure the method and assessment allows for that in the reconciliation process	As per the programme for the completion of the Regional Plan, the draft plans will not be available by August 2021 and will be informed by the reconciliation process.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	5.3.2.1 Programme and reigonal plan level cumulatiev effects assessment	1	3	To meet the requirements of the SEA Regulations, consideration will be given to the cumulative effects between the preferred programmes and the Regional Plan with other relevant plans, programmes or projects. This will include consideration of effects with neighbouring Regional groups, including Water Resources East and Water Resources West Regional Plans and Drought Plans.	should have thought would need to consider the reconciliation process as links to WRSE as well and ultimately what options are supported/progressed in some parts of world and the cascade that has.	The examples provided are not an exhaustive list but merely indicate this is likely to include WRW and WRE.
Environment Agency	5.3.2.1 Programme and reigonal plan level cumulatiev effects assessment	2	1	Cumulative effects with non-water resources related plans, programmes and projects will be considered where relevant, including existing completed projects, approved but uncompleted projects, ongoing activities, plans or projects for which an application has been made and which are under consideration by consenting authorities and plans and projects which are reasonably foreseeable (i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects). Sources of information include the following:	if there are catchment host type projects defined but not with a funding mechanism (again, likely linked to environmental destination) how will the options presented consider these in terms of mutual benefits, enabling delivery etc.	The inclusion of other plans and projects within this assessment will need to be related to certainty of delivery, however the likely catchment projects to be considered will be informed by the work WReN is carrying out within the environmental destination workstream.
Environment Agency	5.5.1 Biodiversity Ne Gain overview			EA Summary Letter	Would benefit from clearer explanation of what will do if the Metric 2.0 tool spreadsheet is not suitable.	As stated in Section 5.5.1, each option will be appraised against the specific SEA objective relating to BNG, regardless of whether the scheme details are sufficient to justify use of the Metric 2.0 tool. The option level appraisal will therefore consider the high level potential for enhancement at the option level. A more detailed assessment of habitat enhancement/creation is likely to be most appropriate at the preferred plan stage where sufficient details for options and option combinations can be collated to provide for a useful assessment.
Environment Agency	5.5.2.2 Idenitfying BNG opportunities and calculating the benefit score	1	4	Enhancement opportunities are added to the Metric as a habitat area and the Metric re-calculates the quantity or balance of (units) of BNG provided, which is also given as a % change from the baseline.	so here is how this process can identify benefits	Noted

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	5.5.2.2 Idenitfying BNG opportunities and calculating the benefit score	2	6	A strategic assessment of off-site opportunity areas will be undertaken to identity suitable parcels of land where the best biodiversity gain could be achieved.	how? I note WRE are doing some extensive natural capital planning for the East of England based on outcomes/objectives. The assessment of a handful of options means that WReN are not really looking at the optimal 'parcels' of land and appear to be just considering the like for like offset as opposed to additional benefits (so in the 1:1 example the company would not be able to show BNG, an appropriate parcel of land could provide habitat plus recreation, flood attenuation or any other number of additional benefits as opposed to a patch of habitat to offset that lost - so really need to understand how this would work. Could achieve multiple objectives with the right location.	We agree that consideration at option-level assessment could only indicate opportunities appropriate for that option in isolation. However appraisal of the alternative and/or preferred plans could consider optimising the enhancement opportunities for the specific set of options to be included in each alternative and/or preferred plan. It should be noted that the nature of any assessment at this plan stage would still need to be high level and detailed consideration of specific enhancement/creation opportunities could only occur at the detailed option design/planning stage. The Natural England BNG guidance does not consider a 1:1 offset as sufficient and this is not suggested for the WReN plan. The reference to 1:1 is merely part of a high level explanation of the Metric 2.0.
Environment Agency	5.5.2.2 Idenitfying BNG opportunities and calculating the benefit score	6	1	The output of the Metric 2.0 tool spreadsheet will provide a table of the habitats and areas required for enhancement/creation to offset the impacts of each element and provide a minimum 10% BNG.	earlier states that will only use if sufficient information for each option. If there isn't, what will the approach be?	As above.
Environment Agency	5.5.2.2 Identifying BNG opportunities and calculating the benefit score			EA Summary Letter	More detail will be needed to understand the off-site opportunity areas mentioned in section 5.5.2.2.	As above.
Historic England	5.6 inkages Between SEA and Options Appraisal	Table 5.5			In terms of Table 5.5 setting out how SEA topics relate to the Six Capitals and approach, we would argue that Archaeology and Cultural Heritage relates strongly to Quality of Place.	We agree and this will be updated in the Environmental Report.
Historic England	5.6 inkages Between SEA and Options Appraisal				Finally, we would encourage you to work with local conservation officers, archaeology officers and local heritage community groups in the preparation of the Environmental Statement. They are best placed to advise on; local historic environment issues and priorities, including access to data held in the Historic Environment Record (HER); how the policy or proposal can be tailored to minimise potential adverse impacts on the historic environment; the nature and design of any required mitigation measures; and opportunities for securing wider benefits for the future conservation and management of heritage assets.	Engagement with these groups will be undertaken at the detailed design stage to ensure any potential impacts on the historic environment are avoided and/or minimised.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	5.6 Linkages between SEA and options appraisal	3	1	The methodology proposed for the Regional Plan options appraisal will align with the environmental metrics developed for individual companies WRMP24, and in particular the Yorkshire Water's 'Six Capitals'78 approach which will be adopted to provide consistency of output.	great that it aligns but with reference to the YWS methodology, need to be clear how the aggregated WRMPs that form a regional plan then have the SEA of options assessed in a coherent way to inform the plans. This iterative process needs to ensure the component WRMPs have this methodology adopted or, at least describe how it integrates with their preferred methodology. Otherwise methodologies may not align between companies/regional plan and it will be hard to reconcile. Also applicable to other regional plans in terms of ensuring any options being considered as part of another groups portfolio are assessed in a comparable way. Assuming all adopting UKWIR method that might be ok though there needs to be consistent outcomes e.g. in combination impact on Humber should have same conclusions for options in all plans as should increased abstraction in Sherwood Sandstone. We also note the fact that the majority of transfer options link to the Tees (from Kielder) which is subject to an operating agreement. While recognising that this document doesn't cover the details of each specific options, it would be helpful to understand how and where such constraints would be considered in the SEA. Think there needs to be some clear distinction in terms of how the scoping, which seemingly focuses on options, will identify and assess appropriate	As above, we can confirm the approach to the environmental assessment of the WRMPs aligns with that presented here e.g. see the YW WRMP 24 SEA Scoping Report and NWL to follow the same approach for any required assessment. The SEA provides an assessment of all feasible options. Any constraints to option identification are considered in the option identification process.
Environment Agency	5.6 Linkages between SEA and options appraisal	3	5	The approach will satisfy the requirements of the WRPG to include NCA in the environmental assessment of water resource options (see Section 2.3) and in addition expand the approach to consider all the relevant capitals, not just natural capital.	as mentioned earlier - would be good to see how comprehensive a natural capital assessment will be.	Further details are provided in the option appraisal workstream methodology document.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	5.6 Linkages between SEA and options appraisal	Table 5.5		SEA and capitals mapping results	how was this derived? For instance livestock - likely to have implications for climate/air as well as material assets/resource use. Not sure I personally follow the inclusion/exclusion in this table of the SEA Topic against the capitals. The stated aim is to avoid double counting. But to my untrained eye, there are clearly costs/benefits to the capitals from the SEA objectives not included e.g. land use objectives (SEA) not linked to flood regulation and water quality not linked to air and climate (requires treatment same as water supply which is mapped to air and climate?). The explanation over how the 'mapping' was done needs greater clarity especially if this will help derive the 'costs' to support decision making.	The mapping has been undertaken using professional judgement and with a focus on the key links which will be relevant to the likely options in the Regional Plan/WRMPs i.e. focused on water resources. The mapping was completed with reference to the specific definition of each capital metric within the Six Capital framework. Water quality is defined as 'Regulation of environmental processes that regulate water quality' and is thus less relevant to air and climate.
Environment Agency	5.6 Linkages between SEA and Options appraisal			EA Summary Letter	As no SEA has been undertaken as part of a Northumbrian Water plan, ensure the data, assessments and methods will be feasible across the whole region or, recognise where there may be gaps in data and uncertainties in the assessments. See comment on Section 5.6 in document.	As above, the SEA appraisal of the WReN plan and options will remain consistent with any assessment carried out by NWL.
Environment Agency	5.6 Linkages between SEA and Options Appraisal	Table 5.5		EA Summary Letter	Table 5.5 capitals mapping results, presented as they are do not well explain the alignment of the six capitals and the SEA topics and the inclusion/exclusion.	As above.
Environment Agency	5.7 Linkages between SEA and environmental decision			EA Summary Letter	Section 5.7 on environmental destination very short. And as much work has been done on prioritising catchments and the risks that inform that prioritisation that seems a bit of an oversight.	The Scoping Report section provides a summary of linkages to the environmental destination workstream which is reported separately.
Environment Agency	5.7 Linkages between SEA and environmental destination	2	4	Where the environmental destination influences the options for inclusion in the Regional Plan this will also provide an additional linkage to the environmental assessment workstream.	options for inclusion - as in drives the need for an option? Surprised the work on assessing catchment sensitivity isn't better referenced within this section. Seems a very short section for something that will materially affect the plan and likely help define any environmental benefits that can be attributable to options. And will also be part of the objectives/metrics that will determine preferred options?	As above, the Scoping Report does not cover the work ongoing in the environmental destination workstream but seeks to highlight the key links between the two.

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Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	6.1 Habitats Regulations Assessment - Overview	2	2	The objective of a HRA is to establish whether a plan or project is likely to have a significant effect on European sites (alone or in-combination with other plans or project)	this will be particularly important where shared resource e.g. Trent being considered elsewhere. need to ensure that in combination affects covered. Also need to define geography. As per early comments, some catchments such as Louth are not in WReN operational area but, if covering South Bank of Humber in assessment of Humber that needs to be identified clearly in the narrative and also an approach agreed to ensure that WRE aren't assessing in a different way and/or including the benefits as well (double counting across plans).	As noted in Section 5.3.1 the effects of an option in it's entirety will be considered in the assessment regardless of whether the effects are inside or outside of the WReN region, and WReN will collaborate with other regional groups to ensure consistency of approach..
Environment Agency	6.1 Habitats Regulations Assessment - Overview	3	2	As the Draft Regional Plan submission does not form a statutory plan or project, the principles of the HRA process will be applied to help identify risks to feasibility and deliverability of the option components.	seems sensible. Would be sensible for WReN to tease out how this high level assessment then translates to the detailed assessments and ensure all the SEA work can be nested i.e. how this cascades and is used in individual WRMPs and specific options as the amount of detail and assessment required increases..	The HRA of the WReN plan will adhere to all required guidance/legislation as set out in the Scoping Report and the same will be the case for the WRMP. It is not anticipated that the level of detail available for options will differ between both plans.
Environment Agency	6.1.1 Stage 1 Screening	4	5	The assessment will consider the construction and operational effects.	including mitigation?	Effects prior to mitigation are considered in the HRA Stage 1 in line with guidance/case law.
Environment Agency	6.1.1 Stage 1 Screening	Table 6.1	Water table/ availability	Changes to water levels and flows due to increased water abstraction, reduced storage or reduced flow releases from reservoirs to river systems.	surprised with the proposals including lots of transfers of water south that the positive change in flow isn't included in the assessment. The use of Tyne/Tees might need assessing against Teesmouth and Cleveland Coast SSSI for instance as well as the receiving Humber catchments. There is likley to be an impact due to hydrological continuity even if the 'source' is upstream.	The table provides some examples of the types of operations leading to each broad category of impacts and is not an exhaustive list. Where an option results in increased flow the relevant effects will be considered.
Environment Agency	6.1.1 Stage 1 Screening	Table 6.1	Toxic contamination	Reduced dilution in downstream or receiving waterbodies due to changes in abstraction or reduced compensation flow releases to river systems.	dependent on the options considered and whether transferred piped etc there may be water quality considerations associated with transfers.	As above.
Environment Agency	6.1.1 Stage 1 Screening	Table 6.1	Non-toxic contamination	Changes to water salinity, nutrient levels, turbidity, thermal regime due to increased water abstraction, storage, or reduced compensation flow releases to river systems.	see earlier comments	As above.
Environment Agency	6.1.1 Stage 1 Screening	Table 6.1	Biological disturbance	Potential for changes to habitat availability, forexample reductions in wetted width of rivers leading to desiccation of macrophyte beds due to changes in abstraction or reduced compensation flow releases to river systems.	or the opposite if increased supported flows/discharges/transfers.	As above.

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Environment Agency	6.1.1 Stage 1 Screening	Table 6.1		EA Summary Letter	Table 6.1 impacts on European sites seems to focus only on increased abstraction. When considering options such as greater transfers and use of Kielder, there may well be extended periods of higher flows. This is not covered. Not considered in the water quality dilution element either. Need to account for both the positive and negative impacts of the operation of such schemes/options where they ultimately impact on designated sites.	As above.
Environment Agency	7 Water framework directive assessment	3	Point 1	A sequential 4-stage process for undertaking WFD compliance assessments will be applied. The sequential four steps are as follows: 1. WFD compliance assessment screening: involves a preliminary assessment of each option and identifies whether there may be any risk of deterioration in WFD status.	issue arising in drought plans is "define deterioration or risk thereof"	Noted.
Environment Agency	8 Next steps	3		Following completion of the assessments the draft SEA Environmental Report, HRA Screening Report (and Appropriate Assessment(s) if required) and WFD Compliance Report will be issued alongside the Draft Regional Plan for consultation to statutory consultees, WReN stakeholders and the wider public in early 2022	as we get further into these site-detail documents, Area input will become increasingly critical to an effective response. How much can we hold off now - relying on NEAS assessment of due process - in hopes of Area input later?	N/A
Environment Agency	Appendix A	Table A1		EA Summary Letter	Appendix A seems very comprehensive but some legislation not described in terms of what the objectives of the policy are and whether it has an influence on the plan. Not fully completed.	All of the remaining legislation listed will be updated in the Environmental Plan to include a description of the respective objectives and whether it has an influence on the plan.
Environment Agency	Appendix A	Table A1		EA Summary Letter	Ensure the plan and scoping represents the region and not just Yorkshire Water.	The table has been updated to clarify that the Scoping Report represents the whole region of the North East of England.
Historic England	Appendix A	Table A1	The World Heritage Convention		In addition, the entry for The World Heritage Convention in Appendix A appears to be missing any review of its contents.	The entry for the World Heritage Convention has been updated.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1			Guessing NEAS will comment on the adequacy of this table. Th elegislation appears bundles together - could the order or themes be made clearer.	A number of the policies listed in the table will have implications for multiple SEA objective themes. Therefore the legislation has been compiled into a hierarchy starting from international legislation and agreements, and finishing with local policy.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		The World Heritage Convention (1972)	at least explain why it does or does not apply	The entry for the World Heritage Convention will be updated.

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Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		The Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)	Just being picky but I'd like habitats specified here	The convention covers all natural habitats which contain wildlife, and does not specify any specific habitats.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		Council of Europe (2003) European Soils Charter	Tees-Swale mine waters clean-up	Should there be any potential linkages between the Tees-Swale Metal Mines Project and any of the regional plan options (including adverse effects in relation to measures in place to reduce diffuse metal pollution) then these will be considered in the SEA.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		European Commission, Floods Directive (2007/60/EC)	what about positive provision/benefit for flood risk management	This entry will be updated in the Environmental Report.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		European Commission, Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals (2006/88/EC)	how is this text about animal health/disease protection	This entry will be updated in the Environmental Report.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		European Economic Community, Directive on Bathing Water (76/160/EEC); and Directive 2006/7/EC repealing Directive 76/160/EEC (from 2014)	Explain	This entry will be updated in the Environmental Report.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		European Commission, Directive on the Assessment and Management of Flood Risks (2007/60/EC)	as above (Explain)	This entry will be updated in the Environmental Report.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		Department for Energy and Climate Change (2020) Energy White Paper: Powering our Net Zero Future. - The implementation of the Regional Plan may have an influence upon Yorkshire Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.	Why only yorkshire water - without mention of other water users?	This entry will be updated in the Environmental Report to include consideration of other water users.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		Department of energy and climate change (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity. - The implementation of the Regional Plan may have an influence upon Yorkshire Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.	YW again - as above (Why only yorkshire water - without mention of other water users?)	This entry will be updated in the Environmental Report to include consideration of other water users.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		Defra (2015) The Great Britain Invasive Non-native Species Strategy. - The implementation of the Regional Plan may influence biodiversity in the Yorkshire River Basin District and the south east and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.	why picking out [yorkshire] Humber district?	This entry will be updated in the Environmental Report.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		Defra (2005) Making space for water: taking forward a new government strategy for flood and coastal erosion risk management in England. - The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the Regional Plan.	as for prevoious flood-related comments	This entry will be updated in the Environmental Report.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		Defra (2015) The government's response to the Natural Capital Committee's third State of Natural Capital report. his provides a number of recommendations such as: Agreement for the development of a 25 year plan for a healthy natural economy. This includes helping organisations understand the economic, social and cultural value the impact their actions have on it and how to use the knowledge for better decisions; identify most important and threatened environmental assets; protection of designated areas; address outstanding monitoring and data issues to enable better decisions about strategic investments in natural capital. Outputs from the SEA process will help to inform any future potential development by Yorkshire Water of Natural Capital Accounting (NCA) approaches to assessing environmental asset performance. Government (led by HM Treasury and Defra) is increasingly using NCA to support future environmental policy and decision-making, and there may be future expectations on water companies to follow suit.	if you're going to cut and paste from existing documents, at least have the decency to proof-read and update	This entry will be updated in the Environmental Report.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		The Energy Act 2013. This provides the legislative framework for delivering secure, affordable and low carbon energy. It includes provisions for decarbonisation, (Unfinished sentence) The implementation of the Regional Plan may have an influence upon Yorkshire Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.	as above (if you're going to cut and paste from existing documents, at least have the decency to proof-read and update)	This entry will be updated in the Environmental Report.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1	Regional		might be national but I couldn't see reference to HS2 - coming to region in theory and may mean more growth or jobs? Mentioned further down - no reference to LEPs except North East one. Any reference to be made to the Energy Uk report on future energy or other energy plans/strategies? (recognising that not all available) NFU water management plan mentioned in narrative - not in here but guess it's not an adopted legal plan as such. These may be omissions that are ok if the nature of the plans is about published strategies/plans but some of the infrastructure issues will need factoring in.	Entries to be added to the table, including: - Energy Usk report on future energy (2019) - Additional LEPs (Humber LEP) and the Northern Powerhouse Partnership.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		Environment Agency, CAMS (various)	abstraction licensing strategy - not CAMS.	This entry will be updated in the Environmental Report
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		North East Local Enterprise Partnership (2019) More and Better Jobs: A strategic economic plan for the North East	is this the only LEP mentioned? Surprised there aren't more, especially with reference to Northern Ambition, Humber Strategy etc.	Entries will be updated in the Environmental Report to add: - Energy UK report on future energy (2019) - Additional LEPs (Humber LEP) and the Northern Powerhouse Partnership.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		North East Local Enterprise Partnership (2019) More and Better Jobs: A strategic economic plan for the North East. Unlikely that these objectives will be effected by the objectives of the Regional Plan SEA.	ensuring water availability would have an indirect or enabling benefit?	Given the high level nature of the Regional Plan SEA, and the level of scheme information currently available, the indirect benefit towards job opportunities in the North East region resulting from greater water availability cannot be determined at this stage.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1		Drought Plans from adjacent water companies. The Regional Plan will take into account the objectives of Yorkshire Water's Drought Plan.	what about everyone elses?	This entry will be updated in the Environmental Report.
Environment Agency	Appendix A - Review of policies, plans and programmes	Table A1			this list brings home the emphasis on preventing deterioration, and the lack of focus throughout WReN on opporunities for benefits and imporvements	This feedback is acknowledged.
Historic England	Appendix B				The mapping of all designated and non-designated heritage assets, with the identification of those at risk, would provide an indication of their distribution, clusters and themes, and highlight particularly sensitive areas. Whilst we acknowledge that Appendix B includes a map depicting nationally important archaeological sites, this however does not include Scheduled Monuments.	Due to the size of the region and the number of Scheduled Monuments these are not included on the map, however they are summarised within the text of the baseline section. However the available data on Scheduled Monuments and other heritage assets (e.g. GIS layers) are all used within the option appraisal process.

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency	Appendix B - Environmental Baseline Supporting Information	Figure B2			At what flow band?	The map utilised the EA data set which illustrates the percentage of time for which additional water may be available for consumptive abstraction.
Environment Agency	General			EA Summary Letter	Ensure alignment with other products. In particular ensuring the regional plan environmental assessment nests well with the required assessments of statutory plans to avoid the need to repeat work. Ensuring environmental assessment for WRMP/WCDP is aligned to this and also ensure that the options at a WRMP level are assessed in a consistent/complementary way if not featuring in the regional plan.	As noted above the approaches for the Regional Plan environmental assessments align with those for the WRMP which will ensure no duplication of effort and facilitate transfer of information between plans.
Environment Agency	General			EA Summary Letter	Ensure the assessment of in combination within and between plans is well accounted for with responsibilities understood e.g. who will complete impact assessment on Humber with several options potentially impacting on flows. (Also linking to WQ modelling).	As noted above the requirement for in combination assessment will need to be reviewed when the draft Regional Plans are available. However we can confirm that ongoing liaison between the regional groups will continue at that stage and this will ensure no redundant/duplicate work occurs. The assessment at the plan stage will remain high level and any detailed WQ modelling would need to be undertaken at a later stage.
Environment Agency	General			EA Summary Letter	Describe the geographical coverage better. Idle and Torne isn't covered yet some South Humber and Lincolnshire plans are referenced as relevant. Similarly much of the content is Humber Basin which is significantly larger than the area covered by WReN. It is not clear whether the data presented is therefore for the River Basin or a subset.	See responses to these specific comments above.
Environment Agency	General			EA Summary Letter	Provide comment/detail on how the group will update the data sets it defines as dated	As above, while the review has been restricted to currently available data, we don't consider the data has limited the overall effectiveness of the review process.
Natural England	General				Natural England agrees with the proposed scope and level of detail to be included in the Environmental Report.	Noted. And we also confirm the extensive data sets referenced in attached Annex and the list of natural environment issues to consider will be reflected in our assessment, and enhancement opportunities will be identified where appropriate.

WReN Regional Plan - Environmental Assessment Scoping Report Consultation Comment Log

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency (NEAS)				EA Comment - Does the Scoping Report outline an appropriate study area and baseline?	Baseline is adequate, although lacks analysis to understand the pressures on baseline receptors for this region e.g. water use - stats given but no understanding on the pressure on usage, biodiversity info given but no information on the pressures currently e.g. habitat fragmentation, development, etc. By explaining the pressures its helps the reader to understand the key issue derived. Future baseline is presented but in most cases comprises an outline of PPPs, rather than presenting an understanding of how that PPP or trend could effect the baseline receptors in the future. For flood risk/water management - would be good to include consideration of nature based solutions Air quality - include the role of vegetation in managing air quality. Population - 4.4.1.2 sets out to cover human health and deprivation. Deprivation hasn't been covered, please include.	As the baseline and future baseline are presented for the extensive geographical region covered by the WReN plan the analysis is constrained to a high level review. The description of the future baseline primarily relates to a review of the changes likely to result from implementation of key PPPs. The Flood Risk section will be updated in the Environmental Report to reference the use of nature-based solutions. A reference will also be made regarding vegetation and air quality. Section 4.4.1.2 to include deprivation.
Environment Agency (NEAS)				EA Comment - Does the Scoping Report identify key issues and provide those scoped in/out?	Generally speaking the key issues identified seem ok, however, they don't always wholly relate to the baseline presented. As an example for water use and issue is noted around the fact that consumption is higher than the national average, but this is not mentioned in the baseline context. They are quite generic.	Unlike detailed studies such as EIA, an SEA is high level and in this case covers a large geographic area, and as a consequence the baseline description must also remain appropriate for the strategic level of the assessment.
Environment Agency (NEAS)				EA Comment - Does the Scoping Report identify key issues and provide those scoped in/out?	Scoping in/out is not done explicitly. It is assumed that the key issues identified form the scope of the assessment. Are there aspects that were scoped out?	In order that all key potential effects for a wide range of options (noting some options are not yet defined) are captured by the assessment it is necessary to include appraisal against the wide range of topics set out in the SEA Regulation and ODP guidance. However within these topics the scope of this assessment is then defined by the objectives and indicator questions which are set out in the scoping report.
Environment Agency (NEAS)				EA Comment - Does the Scoping Report include a PPP review and has this fed through into assessment methodology	Yes a PPP review has been undertaken to inform the SEA scoping and has contirbuted to the assessment framework, with a summary in Chapter 3 and the full review in Appendix A. Extensive list provided, some quite dated. Could include Our plan to rebuild : The UK Government COVID19 recover strategy (2020), Build Back Better (2021) and The Clean Growth Strategy (BEIS, 2017). Note FRMPs and RBMPs are being updated. FRMPs are not referred to in the baseline sections, only CFMPs are.	These additional plans to be included in the Environmental Report. We note that FRMP and RBMP are being updated however the review for the SEA has been restricted to data and information available at this time. FRMPs were reviewed and informed Section 4.6.1.2 however were not referenced. The text will be amended to correct this.

WReN Regional Plan - Environmental Assessment Scoping Report Consultation Comment Log

Author	Report Section	Para/ Table No.	Line	Report Context	Comment	WReN Response
Environment Agency (NEAS)				EA Comment - Does the Scoping Report set out a proposed SEA assessment methodology	Yes Chapter 5 sets out a proposed methdology. The methdology appear adequate and covers the key aspects. It will be important to consider how the SEA is going to influence the consideration of reasonable alternatives and how SEA will feed into decision making. How will the assessment objectives be used to think about alternatives upfront? The assessment methodology currently feels a bit back ended and so this isn't clear. It is good to see consideration of biodiversity net gain, capital approach and env destination.	The environmental assessment will consider all feasible options such that the environmental impacts of each option are identified and are able to inform the option appraisal process and inform the development of alternative programs. The completion of the option assessment at the early stage in the process of plan development will enable feedback into the option development process and allow refinements to avoid or minimise impacts.

Appendix B - Quality assurance checklist

ODPM Guidance[1] on SEA contains a Quality Assurance checklist to help ensure that the requirements of the SEA Directive are met. The checklist is reproduced in **Table B.1**, indicating where this Environmental Report meets the requirements.

Table B.1 Quality Assurance Checklist

Checklist item	Comments
Objectives and context	
The plan's or programme's purpose and objectives are made clear.	The purpose of the WRMP24 is set out in Sections 1 and 2 of this Environmental Report.
Environmental issues and constraints, including international and EC environmental protection objectives, are considered in developing objectives and targets.	Objectives of other relevant plans and programmes are set out in Section 3.2 and **Appendix C**.
SEA objectives, where used, are clearly set out and linked to indicators and targets where appropriate.	Draft objectives are set out in Section 5.1 of this Environmental Report.
Links with other related plans, programmes and policies are identified and explained.	Links are identified in Section 3.2 and **Appendix C** of this Environmental Report.
Conflicts that exist between SEA objectives, between SEA and plan objectives and between SEA objectives and other plan objectives are identified and described	Any such compatibility conflicts would be identified as part of the cumulative assessment completed during Stage B1 of the assessment of options and would be presented in the Environment Report.
Scoping	
Consultation Bodies are consulted in appropriate ways and at appropriate times on the content and scope of the Environmental Report.	The SEA Scoping Report was consulted upon and responses to this are included in this Environmental Report (see **Appendix B**). The consultation process is described in Section 1.6
The assessment focuses on significant issues.	The proposed scope of the assessment reflects the geographic extent of the potential options under consideration by Yorkshire Water, and provides a comprehensive approach to assessment of potentially significant impacts will be considered significant.
Technical, procedural and other difficulties encountered are discussed; assumptions and uncertainties are made explicit.	Difficulties and assumptions are set out in Section 4.4 of this Environmental Report.
Reasons are given for eliminating issues from further consideration.	The proposed objectives provide a comprehensive basis for assessment and at this stage, no issues have been eliminated.

[1] Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive.

Checklist item	Comments
Alternatives	
Realistic alternatives are considered for key issues, and the reasons for choosing them are documented.	The appraisal framework has been used to assess options, programmes and the WRMP. This is set out in Section 7.2 of the Environmental Report.
Alternatives include 'do minimum' and/or 'business as usual' scenarios wherever relevant.	Assessment of alternatives have been considered in the Environmental Report.
The environmental effects (both adverse and beneficial) of each alternative are identified and compared.	Assessment of alternatives have been considered in the Environmental Report.
Inconsistencies between the alternatives and other relevant plans, programmes or policies are identified and explained.	Assessment of alternatives have been considered in the Environmental Report.
Reasons are given for selection or elimination of alternatives.	Assessment of alternatives have been considered in the Environmental Report.
Baseline information	
Relevant aspects of the current state of the environment and their likely evolution without the plan or programme are described.	The current state of the environment and predicted future baseline is set out in Section 4 and **Appendix C** of this Report for each SEA topic.
Environmental characteristics of areas likely to be significantly affected are described, including areas wider than the physical boundary of the plan area where it is likely to be affected by the plan.	The environmental characteristics of the area under consideration for the SEA are described in Section 4 and **Appendix C**.
Difficulties such as deficiencies in information or methods are explained.	Difficulties and limitations are set out in Section 4.4.
Prediction and evaluation of likely significant environmental effects	
Effects identified include the types listed in the Directive (biodiversity, population, human health, fauna, flora, soil, water, air, climate factors, material assets, cultural heritage and landscape), as relevant; other likely environmental effects are also covered, as appropriate.	Potential effects have been set out in the Environmental Report.
Both positive and negative effects are considered, and the duration of effects (short, medium or long-term) is addressed.	The nature and duration of potential effects are set out in the Environmental Report, using an appraisal framework based on the one included in Section 7 of this Report.
Likely secondary, cumulative and synergistic effects are identified where practicable.	These effects have been identified in the Environmental Report.
Inter-relationships between effects are considered where practicable.	These effects have been identified in the Environmental Report, using an appraisal framework based.

Checklist item	Comments
The prediction and evaluation of effects makes use of relevant accepted standards, regulations, and thresholds.	Relevant standards have been used where appropriate in undertaking the assessment in the Environmental Report.
Methods used to evaluate the effects are described.	The Environmental Report has included information on the methods used for evaluation of potential effects.
Mitigation measures	
Measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the plan or programme are indicated.	Mitigation measures for potential negative effects have been incorporated into the assessment undertaken in preparing the Environmental Report.
Issues to be taken into account in project delivery.	Such mitigating measures, if required, have been highlighted against the WRMP options.
The Environmental Report	
Is clear and concise in its layout and presentation.	The Environmental Report has been clear and concise.
Uses simple, clear language and avoids or explains technical terms.	The Environmental Report has used simple, clear language, and explain technical terms, as appropriate.
Uses maps and other illustrations where appropriate.	The Environmental Report has used maps and illustrations where appropriate.
Explains the methodology used.	SEA methodology has been described in the Environmental Report Section 5.
Explains who was consulted and what methods of consultation were used.	The consultation strategy, including organisations and dates of consultation, have been included in the Environmental Report.
Identifies sources of information, including expert judgement and matters of opinion.	Sources of information have been detailed in the Environmental Report.
Contains a non-technical summary covering the overall approach to the SEA, the objectives of the plan, the main options considered, and any changes to the plan resulting from the SEA.	The Environmental Report has included a Non-Technical Summary.
Consultation	
The SEA is consulted on as an integral part of the plan-making process.	This Environmental Report is a part of the consultation process required to meet the requirements of the SEA Directive and will be circulated to consultees. Further consultation will be undertaken on the Environmental Report and Draft WRMP. The consultation process is described in Section 1.7.

Checklist item	Comments
Consultation Bodies and the public likely to be affected by, or having an interest in, the plan or programme are consulted in ways and at times which give them an early and effective opportunity within appropriate time frames to express their opinions on the draft plan and Environmental Report.	This Environmental Report is a part of the consultation process required to meet the requirements of the SEA Directive and will be circulated to consultees. Further consultation will be undertaken on the Environmental Report and Draft WRMP. The consultation process is described in Section 1.7.
Decision-making and information on the decision	
The environmental report and the opinions of those consulted are taken into account in finalising and adopting the plan or programme.	Responses from consultation on the draft Environmental Report will be incorporated in the development of the final Environmental Report. After finalisation of the WRMP, a statement will be published describing how the SEA and the responses to consultation have been taken into account during the preparation of the WRMP (see Section 1.7 of this Environmental Report).
An explanation is given of how they have been taken into account.	Consultation responses, and how they have been incorporated in the final Environmental Report will be incorporated in the report. After finalisation of the WRMP, a statement will be published describing how the SEA and the responses to consultation have been taken into account during the preparation of the WRMP (see Section 1.7 of this Environmental Report).
Reasons are given for choosing the plan or programme as adopted, in the light of other reasonable alternatives considered.	This will be set out following consultation on the draft WRMP and Environmental Report.
Monitoring measures	
Measures proposed for monitoring are clear, practicable and linked to the indicators and objectives used in the SEA.	The Environmental Report has included a section addressing proposals for monitoring.
Monitoring is used, where appropriate, during implementation of the plan or programme to make good deficiencies in baseline information in the SEA.	The suggestions for monitoring have been made in the Environmental Report, with monitoring taking place following implementation of the WRMP, further to consultation with regulatory authorities including the Environment Agency, Natural England, Historic England
Monitoring enables unforeseen adverse effects to be identified at an early stage. (These effects may include predictions which prove to be incorrect.)	The suggestions for monitoring have been made in the Environmental Report, with monitoring taking place following implementation of the WRMP, further to consultation with regulatory authorities including the Environment Agency, Natural England, Historic England

Checklist item	Comments
Proposals are made for action in response to significant adverse effects.	Mitigation measures for adverse effects have been addressed in the Environmental Report.

Appendix C - Review of Policies, Plans and Programmes

The findings of the review of policy, plans and programmes are set out in **Table C.1**. The purpose of the review and the key findings are set out in Section 3.2 of this Environmental Report. This table sets out the purpose and objectives of the policy, plans and programmes, their potential relationship with Yorkshire Water's WRMP and the potential implications of the plan objectives for the objectives of the SEA.

Table C.1: Summary of the Policy, Plans and Programmes reviewed and their link to the Strategic Environmental Assessment

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
International	
Ramsar Convention: The Convention on Wetlands of International Importance (1971)	
The Convention on Wetlands (Ramsar, Iran, 1971) (the "Ramsar Convention") is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their Wetlands of International Importance and to plan for the "wise use", or sustainable use, of all of the wetlands in their territories.	The impacts of the WRMP options on important wetland habitats must be considered as part of the SEA.
The Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)	
International convention which aims to ensure conservation of wild flora and fauna species and their habitats. Special attention is given to endangered and vulnerable species, including endangered and vulnerable migratory species specified in appendices. Enforced in European legislation through the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC).	The impacts of the WRMP options on internationally designated sites, species and important Bird habitats must be considered as part of the SEA.
The Bonn Convention on the Conservation of Migratory Species of Wild Animals (1983)	
Aims to conserve terrestrial, marine and avian migratory species throughout their range. Enforced in European legislation through the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC).	The impacts of the WRMP options on important Bird habitats (i.e. Ramsar sites and SPA designated sites) must be considered as part of the SEA.
Charter for the Protection and Management of Archaeological Heritage (1990)	
The International Council on Monuments and Sites (ICOMOS) International Committee on Archaeological Heritage Management (ICAHM) created a charter to establish principles and guidelines of archaeological heritage management that are globally valid and can be adapted to national policies and conditions. This includes general principles for investigation, maintenance, and conservation as well as reconstruction of architectural heritage.	The impacts of the WRMP options on archaeological heritage sites must be considered as part of the SEA.
United Nations (1992), Convention on Biological Diversity (CBD)	
The main objectives are: Conservation of biological diversity Sustainable use of its components	The commitment to conserving biological diversity must be considered in any WRMP options and the SEA should seek to promote the protection and enhancement of biodiversity.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
Fair and equitable sharing of benefits arising from genetic resources	
The Cancun Agreement (2011) & Kyoto Agreement (1997)	
The agreement represent key steps forward in capturing plans to reduce greenhouse gas emissions and to help developing nations protect themselves from climate impacts and build their own sustainable futures. It includes a shared vision to keep global temperature rise to below two degrees Celsius.	The SEA should seek to promote a reduction in greenhouse gas emissions.
United Nations Economic Commission for Europe (1998) Aarhus Convention - Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	
The Aarhus Convention grants the public rights regarding access to information, public participation and access to justice, in governmental decision-making processes on matters concerning the local, national and transboundary environment. It focuses on interactions between the public and public authorities. The Aarhus Convention has been ratified by the European Community, which has begun applying Aarhus-type principles in its legislation, notably the Water Framework Directive (Directive 2000/60/EC).	The Convention is designed to improve the way ordinary people engage with government and decision-makers on environmental matters. It helps to ensure that environmental information is easy to get hold of and easy to understand. The SEA should seek to provide easily understood information to the public on the environmental implications of the WRMP and its constituent options.
United Nations (2002), Commitments arising from the World Summit on Sustainable Development, Johannesburg	
The World Summit on Sustainable Development proposed broad-scale principles which should underlie sustainable development and growth. It included objectives such as: Greater resource efficiency Work on waste and producer responsibility New technology development Push on energy efficiency Integrated water management plans needed Minimise significant adverse effects on human health and the environment from chemicals by 2020.	These commitments are the highest level definitions of sustainable development. The WRMP should be influenced strongly by all of these themes and should seek to take its aims into account. The SEA should seek to promote the achievement of the sustainable development objectives outlined in this plan.
Paris Agreement (2015)	
The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016. Its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.	The WRMP SEA should take into account the need to consider impacts towards climate change (I.e. contribution towards greenhouse gas emission reductions).
European Commission, Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive)	
This Directive ensures that individual Parties integrate environmental assessment into their plans and	This directive provides the regulatory basis for an SEA being carried out as part of the WRMP.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
programmes at the earliest stages, whereby an SEA becomes mandatory for plans/programmes which are: • Prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town & country planning or land use and which **set the framework** for future development consent of projects listed in the EIA Directive; Or • Have been determined to require an assessment under the Habitats Directive. For any plans/programmes not included in the above, the Member States must carry out a screening procedure to determine whether the plans/programmes are likely to have significant environmental effects.	
The Convention for the protection of the architectural heritage of Europe (Granada Convention) (1985)	
This sets the framework for the approach to conservation across Europe.	The SEA should take into account the need to conserve heritage.
The European Convention on the Protection of Archaeological Heritage (Valetta Convention) (1992)	
The European Convention for the Protection of the Archaeological Heritage sets out a revised body of new basic legal standards for Europe to the previous Granada Convention, to be met by national policies for the protection of archaeological assets as sources of scientific and documentary evidence. It makes the conservation and enhancement of the archaeological heritage one of the goals of urban and regional planning policies.	The SEA should take into account the need to conserve heritage.
Council of Europe (2003) European Soils Charter	
Sets out common principles for protecting soils across Europe and will help.	The SEA should seek to ensure that the quality of the regions land, including soils, is protected or enhanced.
Council of Europe (2006), European Landscape Convention	
European Landscape Convention (ELC) is the first international convention to focus specifically on landscape. Natural England implements the European Landscape Convention in England. The aims of the 2009/10 action plan are: Lead on improving the protection, planning and management of all England's landscapes Raise the quality, influence and effectiveness of policy and practical instruments Increase the engagement in and enjoyment of landscapes by the public Collaborate with partners across the UK and Europe.	The implementation of the WRMP may influence landscape or the enjoyment of landscapes in the Yorkshire River Basin District and as such the SEA should seek to maintain or enhance the quality of the regions landscapes and the potential enjoyment of these landscapes.
The Environment Noise Directive (Directive 2002/49/EC)	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
The END aims to —define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to the exposure to environmental noise. It also aims to provide the basis for developing EU measures to reduce noise emitted by major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and mobile machinery.	The SEA assessment framework should include for the protection against excessive noise.
European Commission (2008) The 2008 ambient air quality directive (2008/50/EC)	
The 2008 ambient air quality directive (2008/50/EC) sets legally binding limits for concentrations in outdoor air of major air pollutants that impact public health such as particulate matter (PM10 and PM2.5) and nitrogen dioxide (NO2). As well as having direct effects, these pollutants can combine in the atmosphere to form ozone, a harmful air pollutant (and potent greenhouse gas) which can be transported great distances by weather systems.	The implementation of the WRMP may have some influence on air quality, either directly or indirectly through construction or operation activities. The SEA should seek to ensure that the region's air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum.
European Commission, Thematic strategy on air pollution (2005)	
This policy sets out interim objectives for air pollution in the EU and measures for achieving them.	The SEA should seek to ensure that the region's air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum.
European Commission (2009) Promotion of the use of energy from renewable sources Directive (2009/28/EC)	
This promotes the use of energy from renewable sources.	The SEA should seek to promote the use of renewable energy.
European Economic Community, Directive on the Conservation of Wild Birds (79/409/EEC) (as amended)	
The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It sets broad objectives for a wide range of activities, although the precise legal mechanisms for their achievement are at the discretion of each Member State	The SEA should seek to protect and conserve wild bird habitats.
European Commission (2009), Birds Directive (2009/147/EC)	
The Directive provides a revised framework for the conservation and management of, and human interactions with, wild birds in Europe. It sets broad objectives for a wide range of activities, although the precise legal mechanisms for their achievement are at the discretion of each Member State (in the UK delivery is via several different statutes).	The SEA should seek to protect and conserve important bird habitats.
European Commission, Floods Directive (2007/60/EC)	
The Directive's aim is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive shall be carried out in coordination with the Water Framework Directive, notably by flood risk management plans and river basin management plans being coordinated, and through coordination of the public	The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the WRMP.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
participation procedures in the preparation of these plans.	
European Commission (2006) Fresh Water Fish Directive (2006/44/EC)	
The Directive seeks to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish populations. For those waters, it sets physical and chemical water quality objectives for salmonid waters and cyprinid waters. The Directive is designed to protect and improve the quality of rivers and lakes to encourage healthy fish populations.	The SEA should seek to promote the protection of river and lake water quality in order to maintain and develop suitable environments that will sustain fresh water fish populations.
European Commission (2007), Establishing measures for the recovery of the stock of European eel (1100/2007)	
This Directive establishes: A framework for the protection and sustainable use of the stock of European eel of the species *Anguilla anguilla* in Community waters, in coastal lagoons, in estuaries, and in rivers and communicating inland waters of Member States that flow into the seas in ICES areas III, IV, VI, VII, VIII, IX or into the Mediterranean Sea; The establishment of Eel Management Plans; The requirement for trans-boundary Eel Management Plans; Measures concerning restocking and Community Waters.	The SEA should seek to promote the protection of eel populations and avoid disruption to the management of their habitats.
European Commission, Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals (2006/88/EC)	
The Directive establishes: Animal health requirements for the placing on the market, importation and transit of aquaculture animals and their products; Minimum measures to prevent diseases in aquaculture animals; Minimum measures to be taken in response to suspected or established cases of certain diseases in aquatic animals.	The implementation of the WRMP may influence biodiversity in the Yorkshire River Basin District and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.
European Commission (2011), Our life insurance, our natural capital: an EU biodiversity strategy to 2020	
This is a long-term vision which was endorsed as a result of the 2010 biodiversity target not being met. It sets out the EU 2020 biodiversity target and vision for 2050. The key targets included: • Conserving and restoring nature; • Maintaining and enhancing ecosystems and their services; • Ensuring the sustainability of agriculture, forestry and fisheries; • Combating invasive alien species; and	The implementation of the WRMP should seek to facilitate achievement of the EU 2020 biodiversity target and 2050 vision, through its existing consideration of impacts towards biodiversity, set out in the SEA objectives.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
Addressing the global biodiversity crisis.	
European Commission, Environmental Liability Directive (2004/35/EC)	
The Directive establishes a framework for environmental liability based on the "polluter pays" principle, with a view to preventing and remedying environmental damage.	The SEA should seek to ensure that the WRMP avoids causing direct or indirect damage to the aquatic environment or contamination of land that creates a significant risk to human health.
European Commission (2000), The Water Framework Directive (2000/60/EC)	
This Directive establishes a framework for the protection of inland surface waters, transitional waters, coastal water and groundwater. It also encourages the sustainable use of water resources. Key objectives are general protection of the aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water.	The SEA should seek to promote the protection and enhancement of all water resources.
European Commission, Drinking Water Directive (1998/83/EC)	
The objective of the Drinking Water Directive is to protect the health of the consumers in the European Union and to make sure the water is clean and of good quality. To make sure drinking water everywhere in the EU is healthy, clean and tasty, the Drinking Water Directive sets standards for the most common substances (so-called parameters) that can be found in drinking water. A total of 48 microbiological and chemical parameters must be monitored and tested regularly.	The SEA should seek to ensure that objectives address water quality in the region, particularly drinking water quality.
European Commission, Urban Waste Water Treatment Directive (1991/271/EC)	
The Directive's objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors and concerns the collection, treatment and discharge of domestic waste water, mixture of waste water and waste water from certain industrial sectors.	The SEA should seek to maintain, protect and improve water quality across the region.
European Economic Community, Directive on Bathing Water (76/160/EEC); and Directive 2006/7/EC repealing Directive 76/160/EEC (from 2014)	
The "new" Bathing Water Directive 2006/7/EC replaced the former Directive 76/160/EC. It applies to surface waters that can be used for bathing except for swimming pools and spa pools, confined waters subject to treatment or used for therapeutic purposes and confined waters artificially separated from surface water and groundwater. The new Directive is intended to • - Be based on scientific knowledge on protecting health and the environment, as well as environmental management experience, • - Provide better and earlier information of citizens about quality of their bathing waters, including logos,	The SEA should seek to maintain, protect and improve water quality of designated bathing waters across the region.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
• - Move from simple sampling and monitoring of bathing waters to bathing quality management, and • - Be integrated into all other EU measures protecting the quality of all our waters (rivers, lakes, ground waters and coastal waters) through the Water Framework Directive.	
European Commission (1992), Habitats Directive (1992/43/EC)	
The aim of the Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance.	The impacts of the WRMP options on internationally designated sites and species must be considered as part of the SEA.
European Economic Community, Groundwater Directive (2006/118/EEC)	
The aim of the Directive is to establish measures to prevent and control groundwater pollution, by requiring Member States to utilise the specified criteria for the assessment of good groundwater and chemical status; and for the identification and reversal of significant and sustained trends, including the identification of measures for trend reversals.	The impacts of the WRMP options on the management of groundwater bodies and their achievement of good groundwater and chemical status must be considered as part of the SEA.
European Commission (2006) Thematic Strategy for Soil Protection	
The Thematic Strategy for Soil Protection consists of a Communication from the Commission to the other European Institutions, a proposal for a framework Directive (a European law), and an Impact Assessment.	The SEA assessment framework should include soils.
European Landscape Convention (Florence Convention)	
The European Landscape Convention is an international convention focusing specifically on landscape. The UK Government signed the European Landscape Convention in 2006 and it became binding from March 2007.	The SEA should take landscape quality into account and include water quality in the assessment framework.
European Economic Community, Marine Strategy Framework Directive (2008/56/EEC)	
This Directive established a framework within which Member States must take the necessary measures to achieve or maintain good environmental status in the marine environment by the year 2020 at the latest. This includes the proposed scope and approach to be taken in the development and implementation of marine strategies by Member States.	The impacts of the WRMP options on designated marine environments and species must be considered as part of the SEA.
European Commission, Directive on the Assessment and Management of Flood Risks (2007/60/EC)	
This Directive requires Member States to assess if all water courses and coast lines are at risk from flooding,	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk.	The impacts of the WRMP options on existing fluvial, groundwater and coastal flood risk must be considered as part of the SEA.
European Commission (2012), A Blueprint to safeguard Europe's Water Resources	
This document outlines actions that concentrate on better implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular as regards water quantity and efficiency. This has a long-term aim to ensure sufficient availability of good quality water for sustainable and equitable use.	The implementation of the WRMP should seek to facilitate the ongoing reliable availability of good quality water.
United Nations (2002), Commitments arising from the World Summit on Sustainable Development, Johannesburg	
The World Summit on Sustainable Development proposed broad-scale principles which should underlie sustainable development and growth. It included objectives such as: Greater resource efficiency Work on waste and producer responsibility New technology development Push on energy efficiency Integrated water management plans needed Minimise significant adverse effects on human health and the environment from chemicals by 2020.	These commitments are the highest level definitions of sustainable development. The WRMP should be influenced strongly by all of these themes and should seek to take its aims into account. The SEA should seek to promote the achievement of the sustainable development objectives outlined in this plan.
National	
The Environmental Assessment of Plans and Programmes Regulations 2004 (the SEA Regulations)	
This represents the transposition of the Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive).	This regulation provides the UK regulatory basis for an SEA being carried out as part of the WRMP.
Water Resource Management Plan Regulations 2007	
These regulations prescribe how water undertakers in England and Wales are to prepare and publish water resources management plans in accordance with Section 37 of the Water Industry Act. This prescribes the method of publication of a draft water resources management plan, and how water undertakers are to deal with representations received in relation to a draft water resources management plan.	This is the UK regulatory basis against which all water undertakers must be compliant in the production of their individual WRMPs.
Ancient Monuments and Archaeological Areas Act 1979	
This act addresses the protection of scheduled monuments including the control of works affecting scheduled monuments. It also addresses archaeological areas.	The WRMP and SEA should take account of the need to protect scheduled monuments and archaeological areas.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
The Climate Change Act 2008	
This act sets carbon targets for 2050. The net carbon account for 2050 at least 80% lower than 1990 baseline.	This target needs to be taken into account by the SEA.
The Climate Change Act 2008 (2050 Target Amendment) Order 26 June 2019	
This amendment changed the UK carbon emissions reduction target from an 80% to a 100% reduction	This target needs to be taken into account by the SEA objective for energy use and greenhouse gas emissions, and adaptation to climate change.
Conservation of Habitats and Species Regulations 2017 (Amendment) (EU Exit) Regulations (2019)	
These regulations consolidate all the various amendments made to the Conservation (Natural Habitats) Regulations 1994 in England. The regulations provide for the designation and protection of 'European sites', the protection of 'European species', and the adaptation of planning and other controls for the protection of European Sites. They are the principal means by which the Habitats Directive is transposed in England as such its main objective is to promote the maintenance of biodiversity.	The impacts of the WRMP options species diversity must be considered as part of the SEA.
The Countryside and Rights of Way (CROW) Act, 2000	
The Act provides for increased public access to the countryside and strengthens protection for wildlife. The main provisions of the Act are as follows: Extends the public's ability to enjoy the countryside whilst also providing safeguards for landowners and occupiers Creates new statutory right of access to open country and registered common Land Use Consultants Modernises Right of Way system Gives greater protection to SSSIs Provides better management arrangements for AONBs Strengthens wildlife enforcement legislation.	The WRMP may have an effect on public access to the countryside. The SEA should include objectives that take into account public access, protection of SSSIs and the management of relevant landscape designations.
The Natural Environment and Communities Act 2006 (NERC Act)	
This provides the legislative framework to extend the biodiversity duty set out in the Countryside and Rights of Way (CROW) Act to public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity. Importantly, Section 41 of the Act refers to a published list of habitats and species which are of principal importance for the conservation of biodiversity in England. This duty applies to all utility companies.	There are a range of designated Natural Environment and Rural Communities (NERC) Act Section 41 habitats within the WRMP supply area. The WRMP may have an effect on NERC habitats and therefore the SEA must include objectives that take these effects into account.
DCLG (2012) National Planning Policy Framework (as amended 2019)	
Presumption in favour of sustainable development. Core planning principles include taking account of the	The WRMP and SEA should take account of the key components of sustainable development, Also,

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
development needs of an area; contribute to conserving and enhancing the environment; re-use of previously developed land; conserve heritage assets; deliver sufficient community facilities to meet local needs. Delivering sustainable development includes: Building a strong competitive economy; Supporting a prosperous rural economy; Promoting sustainable transport; Requiring good design; Promoting healthy communities; Protecting green belt land; Meeting the challenge of climate change, flooding and coastal change; Conserving and enhancing the natural environment; Conserving and enhancing the historic environment; Facilitating the sustainable use of minerals. Reservoirs are included within the definition of open space - of public value due to opportunities for sport and recreation and providing a visual amenity.	reservoirs contribute to recreation and visual amenity.
Department for Energy and Climate Change (2020) Energy White Paper: Powering our Net Zero Future	
The white paper outlines a series of policies and commitments made by the government as part of the transition to net zero carbon emissions. The strategies are three fold: • Prioritisation of renewable sources energy generation and invest in low-carbon technologies • Supporting a green recovery from COVID-19 through investment in green industries. • Creating a fair deal for consumers through facilitating competition, enhanced regulation and strategies to improve the energy performance of homes.	The implementation of the WRMP may have an influence upon Yorkshire Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.
Department of energy and climate change (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity	
This white paper outlines a package of reforms so that by 2030 there will be a flexible, smart and responsive electricity system, powered by a range of low carbon sources of electricity. This includes engaging with consumers on energy use. Decarbonisation is important in meeting the 2050 targets.	The implementation of the WRMP may have an influence upon Yorkshire Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.
Defra (2011) Government Review of Waste Policy in England 2011	
The review is guided by the "waste hierarchy", EU obligations and targets on waste management, carbon impacts, environmental objectives and the costs and benefits of different policy options. The Governments vision include a move beyond the current throwaway society to a "zero waste economy" in which material resources are re-used, recycled or	The WRMP may involve options that involve the generation of waste (e.g. either through construction requirements or operation of supply side options). The SEA should seek to enhance recycling and minimise the amount of waste going to landfill.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
recovered wherever possible, and only disposed of as the option of very last resort.	
HM Government (2018) Our Waste, Our Resources: A Strategy for England	
In response to the 25 Year Environmental Plan, this document sets out a targeted strategy for preserving our stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy	The SEA should take into account effects on resource use and waste and benefits of promoting resource efficiency.
Defra (2017) The UK Climate Change Risk Assessment 2017 Evidence Report	
Identifies themes that form the priorities for adaptation in the UK.	The SEA should take into account the need for climate change adaptation.
Defra (2011) Water for Life - Water White Paper	
This sets out market reform in the water sector.	The WRMP should take into account the contents of this paper.
Defra (2011) UK National Ecosystem Assessment and Defra, 2014, UK National Ecosystems Assessment Follow on, Synthesis of Key Findings	
Ecosystems services from natural capital contribute to the economic performance of the nation. Information and tools to enable decision makers to understand the wider value of ecosystems and their associated services.	For the purposes of the readership integrating an ecosystems services approach into the SEA is not being undertaken. However, it is realised that through the 'Objective-led' approach, many of the services relevant to the WRMP can be considered through the objectives and key questions for example: Provisioning Services: Freshwater Provisioning Services: Biodiversity Regulating Services: Water Regulation Cultural services: Recreation and ecotourism Cultural services: Cultural heritage values Cultural services: Aesthetic The SEA should ensure the WRMP effects the related provisioning services in the least damaging way through informing the WRMP formulation and selection of WRMP options during times of Drought.
Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network	
This independent review of England's wildlife sites and the connections between them sets objectives and recommendations to help achieve a healthy natural environment that will allow our plants and animals to thrive.	The SEA should seek to maintain or enhance the quality of habitats and biodiversity.
Defra (2009) Safeguarding our soils – A Strategy for England	
The new Soil Strategy for England – Safeguarding our Soils – outlines the Government's approach to safeguarding our soils for the long term. It provides a clear vision to guide future policy development across a	The SEA should seek to ensure that the quality of the regions soils and their management is protected or enhanced.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
range of areas and sets out the practical steps that we need to take to prevent further degradation of our soils, enhance, restore and ensure their resilience, and improve our understanding of the threats to soil and best practice in responding to them. The Governments vision is that: By 2030, all England's soils will be managed sustainably and degradation threats tackled successfully. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.	
Defra (2015) The Great Britain Invasive Non-native Species Strategy	
The Strategy is intended to provide a strategic framework, updated from the 2008 framework, within which the actions of government departments, their related bodies and key stakeholders can be better co-ordinated. Its overall aim is to minimise the risks posed, and reduce the negative impacts caused, by invasive non-native species in Great Britain.	The implementation of the WRMP may influence biodiversity in the Yorkshire River Basin District and the south east and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.
Natural England (2016), Conservation 21 – Natural England's Conservation Strategy for the 21st Century	
This strategy sets out a new approach to reverse biodiversity loss, protect natural landscapes for public enjoyment and for the services that they provide. The strategy is based on three guiding principles: 1. Creating resilient landscapes and seas 2. Putting people at the heart of the environment 3. Growing natural capital	The WRMP and SEA should seek to ensure that the natural environment and distinctive landscapes are protected and public access to them are maintained.
Defra (2008) Future Water: The Government's water strategy for England	
This strategy is the high level Government document which outlines how the Government wants the water sector to look by 2030, considering issues of water demand, water supply, water quality in the natural environment, surface water drainage, river and coastal flooding, greenhouse gas emissions and charging. that "by 2030 at the latest, we have: Improved the quality of our water environment and the ecology which it supports, and continued to provide high levels of drinking water quality from our taps Sustainably managed risks from flooding and coastal erosion, with greater understanding and more effective management of surface water Ensured a sustainable use of water resources, and implemented fair, affordable and cost-reflective charges.	The SEA should seek to ensure that the themes included in the strategy objectives are also reflected in the SEA objectives, particularly around water quality in the region, the quality of aquatic ecology, drinking water quality, resource use, energy use and greenhouse gas emissions, and adaptation to climate change.
Defra (2007) The Air Quality Strategy for England, Scotland and Wales	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
This strategy identifies air quality objectives and policy options to further improve air quality in the UK from into the long term. The options are intended to provide important benefits to quality of life and help protect the environment as well as the direct benefits to public health.	The implementation of the WRMP may have some influence on air quality, either directly or indirectly through construction or operation activities. The SEA should seek to ensure that the region's air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum.
Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services	
The objective for the next decade is: 'to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.' Four action areas are: A more integrated large-scale approach to conservation on land and at sea Putting people at the heart of biodiversity policy Reducing environmental pressures Improving our knowledge.	The SEA must consider impacts on biodiversity. The implementation of the WRMP may influence biodiversity in the area and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity, and take regards of priority species.
Defra (2008) England Biodiversity Strategy –climate change adaptation principles	
Government strategy presenting five principles that are fundamental to conserving biodiversity during climate change. The precautionary principle underlies all the principles.	The SEA must consider the impacts on biodiversity whilst also taking into account the potential for future climate change.
Defra (2005) Making space for water: taking forward a new government strategy for flood and coastal erosion risk management in England	
The strategy outlines how to manage the risks from flooding and coastal erosion in the UK. The strategy aims to reduce the threat of flooding to people and their property, and to deliver the greatest environmental, social and economic benefit, consistent with the Government's sustainable development principles.	The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the WRMP.
Defra (2005) Securing the Future: Delivering UK Sustainable Development Strategy	
The strategy for sustainable development aims to enable all people to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations. The strategy places a focus on protecting natural resources and enhancing the environment.	The SEA must seek to ensure that objectives relating to sustainable development, sustainable resource use and protecting the natural environment, are considered when assessing the potential impacts of the WRMP.
Defra (2004) The First Soil Action Plan for England	
This plan is a comprehensive statement on the state of the UK's soils and how Government and other partners were working together to improve them. Ensure that England's soils will be protected and managed to optimise the varied functions that soils perform for society (e.g. supporting agriculture and forestry, protecting cultural heritage, supporting biodiversity, as a platform for construction), in keeping with the principles of sustainable development.	The SEA should seek to ensure that the quality of the region's land, including soils, is protected or enhanced.

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Defra (2004) Rural Strategy	
The strategy sets out rural and countryside policy, and draws upon from lessons learnt following the rural white paper. Objectives include supporting economic and social regeneration across rural England and enhance the value of the countryside and protect the natural environment for this and future generations.	The implementation of certain WRMP options may have an effect upon rural communities and the countryside. The SEA should also seek to ensure that the quality of the region's landscapes, natural resources and biodiversity are maintained or enhanced.
Defra (2002) The Strategy for Sustainable Farming and Food – facing the future	
This strategy sets out how industry, Government and consumers could work together to secure a sustainable future for our farming and food industries. The strategy's objectives are to support the viability and diversity of rural and urban economies and communities, respect and operate within the biological limits of natural resources (especially soil, water and biodiversity) and achieve consistently high standards of environmental performance by reducing energy consumption, by minimising resource inputs, and use renewable energy wherever possible.	The implementation of the WRMP may have some indirect links with the food industry, through ensuring the availability of water for food based activities. The SEA should also seek to promote the most effective use of the region's natural resources, including soil, biodiversity and energy resources.
Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White Paper	
This paper sets out a new approach for protecting and improving the natural environment, developing a green economy and reconnecting people to nature, based on the findings of the UK National Ecosystem Assessment.	The WRMP and SEA should seek to ensure that the natural environment and distinctive landscapes are protected and public access to them, are maintained.
Defra (2015) The government's response to the Natural Capital Committee's third State of Natural Capital report	
This provides a number of recommendations such as: Agreement for the development of a 25 year plan for a healthy natural economy. This includes helping organisations understand the economic, social and cultural value the impact their actions have on it and how to use the knowledge for better decisions; identify most important and threatened environmental assets; protection of designated areas; address outstanding monitoring and data issues to enable better decisions about strategic investments in natural capital. Assigning institutional responsibility for monitoring the state of natural capital. Organisations that manage land and water assets should create a register of natural capital for which they are responsible.	Outputs from the SEA process will help to inform any future potential development by Yorkshire Water of Natural Capital Accounting (NCA) approaches to assessing environmental asset performance. Government (led by HM Treasury and Defra) is increasingly using NCA to support future environmental policy and decision-making, and there may be future expectations on water companies to follow suit.
UK Government (2018), A Green Future: Our 25 Year Plan to Improve the Environment	
The 25 Year Plan sets out to deliver cleaner air and water in our cities and rural landscapes, protect threatened species and provide richer wildlife habitats, in addition to tackling the effects of climate change. The 25-year goals include: 1. Clean air; 2. Clean and plentiful water; 3. Thriving plants and wildlife;	The WRMP and SEA objectives should be consistent with the principles behind the 25-year goals of the plan. The SEA should seek to ensure that the themes included in the 25-year goals are also reflected in the SEA objectives, particularly around air quality, water quality in the region, the quality of aquatic ecology, flood risk, drinking water quality, resource use, energy use and greenhouse

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
4. A reduced risk of harm from environmental hazards such as flooding and drought; 5. Using resources from nature more sustainably and efficiently; 6. Enhanced beauty, heritage and engagement with the natural environment; In addition, managing pressures on the environment by: 7. Mitigating and adapting to climate change; 8. Minimising waste; 9. Managing exposure to chemicals; and 10. Enhancing biosecurity.	gas emissions, adaptation to climate change and landscape and visual amenity.
Defra (2020), The Draft Environment Bill 2020, and content related to the development of Nature Recovery Networks (parts 6 and 7)	
This policy paper provides greater clarity on some of the key changes proposed in the 25 Year Environmental Plan, including: - The implications of the requirement for local areas to develop a Local Nature Recovery (LNR) Strategy, in driving the delivery of a National Nature Recovery Network; - New 'biodiversity net gain' measures as part of the planning requirements for new developments; and New measures that will support the design and delivery of strategic approaches for the protection of both species and habitats.	The WRMP and SEA objectives for biodiversity should take account of the need to consider impacts towards LNR and NNR strategies and potential for biodiversity net gain.
Natural Capital Committee (2020) State of Natural Capital Annual Report 2020	
This provides an overview of the progress made towards the 10 goals set out in the 25 Year Environmental Plan and reiterates the importance of embedding the natural capital approach in decision making for the areas of natural capital accounts, the National Food Strategy, review of national landscapes, and local nature and national nature recovery strategies.	The WRMP and SEA objectives for biodiversity and landscape and visual amenity should take account of the need to consider impacts towards natural capital and biodiversity resources, LNR and NNR strategies, protection and enhancement of designated landscapes.
Department for Culture, Media and Sport (2001) The Historic Environment – A Force for the Future	
This strategy outlines the Governments policy regarding the historic environment. The strategy has key aims and objectives that demonstrate the contribution the historic environment makes to the country's economic and social well-being.	The implementation of the WRMP may have an influence on the heritage of the region, particular if options affect surface water levels. The SEA should seek to ensure any adverse effects on heritage assets are minimised or avoided.
The Energy Act 2013	
This provides the legislative framework for delivering secure, affordable and low carbon energy. It includes provisions for decarbonisation,	The implementation of the WRMP may have an influence upon Yorkshire Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
Environment Act, 1995	
The Environment Act set up the EA to manage resources and protect the environment in England and Wales	The SEA should seek to promote the protection and enhancement of all water resources without having negative effects on other aspects of the Environment.
Environment Agency (2014) Corporate Plan 2014 - 2016	
This sets out the EA's priorities for the environment between 2014 and 2016. Priority areas include: A changing climate Increasing the resilience of people, property and businesses to the risks of flooding and coastal erosion Protecting and improving water, land and biodiversity	The SEA should seek to ensure that priorities are also reflected in the SEA objectives particularly regarding the protection and improvement of water, land and biodiversity.
Environment Agency (2010), Water Resources Action Plan for England and Wales	
The strategy has four main aims: Adaptation to and mitigation of climate change; A better water environment; Sustainable planning and management of water resources; People valuing water and the water environment	
Environment Agency (2009), Water Resources Strategy for England and Wales	
This is the national EA strategy for water resource management in the long term. It looks to 2050 and considers the impacts of climate change, the water environment, water resource and valuing water. Aims and objectives include: Ensure water is used efficiently in homes and buildings, and by industry and agriculture Provide greater incentives for water companies and individuals to manage demand Share existing water resources more effectively	The SEA should seek to ensure that strategy objectives are also reflected in the SEA objectives, particularly around water resource use and availability in the region.
Environment Agency (2015) Creating a Better Place: Environment Agency Corporate Strategy 2014-2016	
The strategy sets out the EA's ambitions for the environment between 2014 and 2016. Priority areas include: A changing climate Increasing the resilience of people, property and businesses to the risks of flooding and coastal erosion Protecting and improving water, land and biodiversity Improving the way the EA works as a regulator to protect people and the environment and support sustainable growth	The SEA should seek to maintain, protect and improve water quality across the region and ensure efficient use of resources. The SEA should seek to ensure that strategy objectives are also reflected in the SEA objectives particularly regarding the protection and improvement of water, land and biodiversity.
Environment Agency (2016), Managing Water Abstraction	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
This sets out how the EA manages water resources in England and Wales.	The SEA should consider the range of impacts that changes to abstractions could have on the environment, including water bodies, biodiversity, and water users.
Environment Agency, Shoreline Management Plans	
A large-scale assessment of the risks associated with coastal processes with the aim to help reduce these risks to people and the developed, historic and natural environments. Coastal processes include tidal patterns, wave height, wave direction and the movement of beach and seabed materials. The second generation of Shoreline Management Plans (SMPs) are in production, covering the entire 6000 kilometres of coast in England and Wales. This generation of plans aim to incorporate sea level rise resulting from climate change and current defences with limited life and improvement requirements.	The SEA should seek to promote a reduction of the risks identified in the Shoreline Management Plans.
Environment Agency (undated) WFD River Basin Characterisation Project: Technical Assessment Method - River abstraction and flow regulation	
This paper describes the method used to assess the likelihood of river water bodies achieving the relevant WFD objectives as a result of artificial influences on low river flows.	Implementation of the WRMP may impact river water quality. The SEA should seek to promote the protection and enhancement of biodiversity and river water quality across the region.
Environment Agency (undated) Hydroecology: Integration for modern regulation	
This paper describes clear way forward in terms of hydroecology and a strategic direction to its development and application.	The WRMP and SEA should ensure relevant ecological considerations are integral to water resource evaluation and management decisions across the range of temporal and spatial scales.
The Environmental Damage (Prevention and Remediation) (England) Regulations 2015	
These regulations amend the 2009 regulations and provide additional protection to habitats and species identified on Annexes 1 and 2 of the EC Habitats Directive (92/43/EEC), SSSIs and, in some cases, classified waterbodies from environmental damage where an operator has intended to cause damage or been negligent to the potential for damage. Applies to the most serious categories of environmental damage, including: Contamination of land that results in a significant risk of adverse effects on human health Adverse effects on surface water or groundwater consistent with a deterioration in the water's status Adverse effects on the integrity of a Site of Special Scientific Interest (SSSI) or on the conservation status of species and habitats protected by EU legislation outside SSSIs	The SEA should seek to ensure that the guidance provided by the regulations is considered when assessing the WRMP.
Environment Agency (2018) The Environment Agency's approach to groundwater protection	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
This document contains position statements which detail the Environment Agency's approach to managing and protecting groundwater. The primary aim of all of the position statements is the prevention of pollution of groundwater and protection of it as a resource.	The WRMP and SEA approach to groundwater protection should be compliant with the Environment Agency's approach.
Environment Agency (2021) Water Resources Planning Guideline	
This document provides an update to the 2017 Water Resources Planning Guidelines for water undertakers in England and Wales. The most significant changes are that water companies: - Should use natural capital in decision-making and provide environmental net gain through their WRMPs; - Should plan to provide a long-term destination for the environment by reducing abstraction where it is causing the most environmental damage. - Are expected to be resilient to any drought of a return period of once in 500 years; and - Take account of regional plans.	The WRMP and SEA should be compliant with the updated requirements of the WRPG.
The Eels (England and Wales) Regulations 2009 (as amended)	
Implement European Council Regulations 1100/2007 establishing measures for the recovery of the stock of European eel. The Regulations will help implement delivery Eel Management Plans. They address eel records and re-stocking, close season and reduction of fishing effort, passage of eels and entrainment. The key objective is to ensure that at least 40% of the potential production of silver eels returns to the sea to spawn. This will be achieved by reducing exploitation of all life-stages of the eel and restoration of their habitats.	The SEA should seek to should seek to maintain or enhance the quality of habitats and biodiversity, and take regard of protected species identified. This should include migratory fish species and their migratory passage.
Historic England (2020) Heritage at Risk Register 2020	
Heritage at Risk is a national project that aims to identify the endangered sites (historic buildings and places with increased risks of neglect and decay) and then help secure them for the future.	The SEA should seek to protect and enhance heritage and landscape.
English Heritage, now known as Historic England (2008) Climate Change and the Historic Environment	
Sets out the current thinking on the implications of climate change for the historic environment. It is intended both for the heritage sector and also for those involved in the wider scientific and technical aspects of climate change; in the development of strategies and plans relating to the impact of climate change; or in projects relating to risk assessment, adaptation and mitigation.	The SEA should seek to assess the implications of the WRMP in combination with climate change and the potential impacts on heritage and the historic environment.
Flood and Water Management Act, 2010 as amended	
The Flood and Water Management Act 2010 aims to provide better, more comprehensive management of flood risk for people, homes and businesses. It aims improve efficiency in the water industry, improve the	The WRMP also aims to ensure continuity of water supplies across the region are maintained.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
affordability of water bills for certain groups and individuals, and help ensure continuity of water supplies to the consumer.	
Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment	
Guidance for addressing the historic environment in Strategic Environmental Assessment or Sustainability Appraisal. It identifies the recommended list of plans, programmes and policies for review, approach to baseline review, potential sustainability issues.	The SEA should consider the potential effects of the WRMP on the historic environment, particularly designated assets and their settings, and to important wetland areas with potential for paleo-environmental deposits. Historic characterisation can supplement information about designations. Sustainability issues, objectives and indicators identified in this document should be taken into account in the SEA.
Historic England (2015) Historic Environment Good Practice Advice in Planning Note 3	
This provides guidance on managing change within settings of heritage assets. This includes archaeological remains, historic buildings, sites, areas and landscapes.	The SEA should take into account effects on settings of heritage assets.
Historic England (2017) The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning 3, 2nd Edition	
This replaces The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 – 1st Edition. It sets out general advice on understanding setting, and how it may contribute to the significance of heritage assets and allow that significance to be appreciated, as well as advice on how views contribute to setting.	The SEA should take into account effects on settings of heritage assets.
HM Treasury Infrastructure UK (2014) National Infrastructure Plan	
The Plan focuses on economic infrastructure: the networks and systems in energy, transport, digital communication, flood protection, water and waste management. These are all critical to support economic growth through the expansion of private sector businesses across all regions and industries, to enable competiveness and to improve the quality of life of everyone in the UK. The objectives for the water sector are 'to secure a fair deal for customers while enabling water companies to continue to attract low-cost investment needed to provide the high quality, resilient water services customers want.'	The SEA objectives should take into account the objectives for the water sector presented in this plan.
HM Government (2016) National Infrastructure Delivery Plan 2016-2021, Infrastructure Projects Authority	
The Plan explores the Government's plans for economic infrastructure for 2016-2021 and the resultant economic benefits. The objectives for the water sector are 'to ensure resilient, sustainable and affordable water and sewerage services'.	The SEA objectives should take into account the objectives for the water sector presented in this plan.
Natural Environment and Rural Communities Act, 2006	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
This Act makes provision about bodies concerned with the natural environment and rural communities in connection with wildlife, sites of special scientific interest, National Parks and the Broads. The Natural Environment and Rural Communities Act is designed to help achieve a rich and diverse natural environment and thriving rural communities.	The SEA should seek to maintain or enhance the quality of habitats and biodiversity. The impacts of the WRMP on any designated features, as highlighted in the Natural Environment and Rural Communities Act, should be addressed.
Planning (Listed Buildings and Conservation Areas) Act 1990	
This addresses listed buildings including prevention of deterioration and damage and preservation and enhancement of conservation areas.	The WRMP and SEA should take account of the need to protect listed buildings and conservation areas.
Salmon and Freshwater Fisheries Act, 1975	
The Act lays down the present basic legal framework within which salmon and freshwater fisheries in England are regulated. Proposals have been made to extend the legislation to apply to more fish species e.g. coarse fish, eel and lamprey species. These proposals are currently under review. The Act covers legislation on fishing methods and related offences, obstructions to fish passage, salmon and freshwater fisheries administration and law enforcement. Proposed extensions to the legislation (under review) include the provision of fish passes and screening of water abstraction and discharge points for coarse fish, eel and lamprey species.	The Act Provides statutory requirements for maintaining fish passage. The SEA will cover fish passage as an element of at least one sustainability objective. The SEA should seek to address any potential issues or effects on existing measures to address fish passage.
The Water Act, 2003 (as amended)	
The Water Act 2003 is in three Parts, relating to water resources, regulation of the water industry and other provisions. The four broad aims of the Act are: The sustainable use of water resources Strengthening the voice of consumers A measured increase in competition The promotion of water conservation.	The implementation of the WRMP may have an effect through its role in maintaining supplies of water. The SEA should seek to promote sustainable use of water resources.
The Water Environment (WFD) (England and Wales) Regulations, 2003	
These Regulations make provision for the purpose of implementing in river basin districts within England and Wales The Water Framework Directive (2000/60/EC) of the European Parliament. The Regulations require a new strategic planning process to be established for the purposes of managing, protecting and improving the quality of water resources.	The SEA should seek to promote the protection and enhancement of all water resources. The SEA should seek to maintain, protect and improve water quality across the region and ensure efficient use of resources.
Water Resources Act, 1991 (Amendment) (England and Wales) Regulations 2009 SI3104	
Amends Water Resources Act 1991 by extending the use of Water Protection Zones and Works Notices, in particular to deal with harm to aquatic ecosystems caused by the physical characteristics of a water course	The SEA should include objectives that cover hydromorphological aspects and seek to ensure that hydromorphological features within the plan are maintained or enhanced.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
or lake, such as quantity, structure and substrate of river/lake bed. Aligns the Water Resources Act with the hydromorphological requirements of the WFD	
Wildlife and Countryside Act, 1981 (as amended)	
The Act is the principle mechanism for providing legislative protection of wildlife in Great Britain. Species listed in Schedule 5 of the Act are protected from disturbance, injury, intentional destruction or sale. Other provisions outlaw certain methods of taking or killing listed species. This Act is brought up to date regularly to ensure the most endangered animals are on the schedule. The Act also improved protection for the most important wildlife habitats.	Some aspects of the WRMP may have effects on habitats and species in the TWUL supply area and beyond. The SEA should seek to maintain or enhance the quality of habitats and biodiversity, and take regard of protected species and habitats.
UKTAG on the WFD e.g. Phase 3 Review of Environmental Standards	
UKTAG prepares technical guidance designed to facilitate consistent implementation of the WFD in the UK. This report identifies standards for certain chemicals known as specific pollutants, developments in assessments of risk to groundwater, non-native species, standards for flows in rivers, standards for levels in lakes, standards for acidity in rivers and standards in intermittent discharges.	The SEA should seek to ensure that the guidance provided by the plan are considered when assessing the WRMP, especially with respect to objectives relating to ecology, water quality and water quantity. The SEA should also ensure the guidance in the plan is used in relation to other related regulations for example the Habitats Directive. The guidance could contribute to the formulation of any criteria for assessing significance of effects.
UK Climate Projections UKCP18. UKCIP, 2018	
The UKCP18 Projections provide a basis for studies of impacts and vulnerability and decisions on adaptation to climate change in the UK over the 21st century. Projections are given of changes to climate, and of changes in the marine and coastal environment; recent trends in observed climate are also discussed. The methodology gives a measure of the uncertainty in the range of possible outcomes; a major advance beyond previous national scenarios The Projections will allow planners and decision-makers to make adaptations to climate change. In order to do so they need as much good information as possible on how climate change will evolve. They are one part of a UK government programme of work to put in place a new statutory framework on, and provide practical support for, adaptation.	The WRMP does take account of UKCP18 projections as its formulation through the WRMP process which takes account of climate change in its supply and demand projections. The SEA should also use UKCP18 projections in the broader assessment of climate change effects and any potential cumulative effects. For example the ecological requirements of aquatic habitats that may be affected by the WRMP will also be influenced by climate change.
Defra (2018), The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting	
This second National Adaptation Programme (NAP) sets out the government's response to the second Climate Change Risk Assessment (CCRA). High level actions are presented for addressing the key risks identified, including in relation to the following areas: - Flooding and coastal change risks to communities, businesses and infrastructure;	The SEA objectives of the WRMP should take into account the key risks identified in this document, for the relevant areas, including towards flood risk, public water supply, ecological resilience, risks to natural capital and INNS.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
- Risks of shortages in the public water supply for agriculture, energy generation and industry; - Risks to natural capital including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity; and New and emerging pests and diseases and invasive non-native species affecting people, plants and animals.	
Water Industry Act 1991 was amended by the commencement of Section 36 of the Flood and Water Management Act 2010	
This makes provision for general duties of water undertakers including those associated with water resources management plans and sets out supply duties.	The WRMP must take into account this legislation.
Marine and Coastal Access Act (2009)	
This Act created new powers to protect marine habitats and their wildlife, including: • A new marine planning system; • The creation of Marine Conservation Zones; • Changes to the management of inshore fisheries at national and local level; • Designation of an Exclusive Economic Zone; • Changes to the system for managing migratory and freshwater fish; and Enabling greater recreational access to the English and Welsh coasts.	The WRMP must take this legislation into account .
UK Marine Policy Statement (2011)	
This is a framework for supporting the formulation of Marine Plans and sets out the UK vision for the marine environment and policy objectives for the key objectives that occur within the marine environment.	The SEA objectives of the WRMP should take into account the UK vision and policy objectives in this document.
Defra (2020) Draft North East Inshore and East Offshore Marine Plans (for consultation)	
These plans seek to provide certainty and clarity for developers seeking to build in marine environments, by indicating areas to consider or avoid and facilitate an integrated and holistic approach to the planning and management of coastal areas. Four key aims include: 1. This plan introduces a strategic approach to planning within the inshore and offshore waters between the Scottish border and Flamborough Head, in Yorkshire; 2. Applies national policies in a local context, ensuring the needs and aspirations of both of the marine plan areas are reflected; 3. Enable activities to move more quickly from concept to consent by identifying areas suitable for investment, encouraging earlier and clearer	The SEA objectives of the WRMP should take into account the aims of the marine plan, particularly in relation to the drive for enhancement and protection of vulnerable habitats and species, and natural defences against climate change and flooding.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
communication between developers and regulatory decision-makers; and 4. Implementation of the plan's policies, through more informed decision-making, will help to optimise use of the marine area's natural capital and realise greater enhancement and protection of vulnerable habitats and species, and natural defences against climate change and flooding.	
Defra and Environment Agency (2014) Understanding the risks, empowering communities, building resilience: The National Flood and Coastal Erosion Risk Management Strategy for England	
This strategy builds on existing approaches to flood and coastal risk management and promotes the use of a wide range of measures to manage risk.	The SEA objectives of the WRMP should take the long-term ambitions in this document into account.
National Flood and Coastal Erosion Risk Management Strategy for England (2020)	
This updated strategy describes what needs to be done by all risk management authorities, including water and sewerage companies, involved in flood and coastal erosion risk management. It has 3 long-term ambitions: 1. Climate resilient places: improving resilience to flooding and coastal change; 2. Making the right investment and planning decisions to secure sustainable growth, environmental improvements and infrastructure resilient to flooding and coastal change; and Educating local communities to make sure that they understand their risk to flooding and coastal change.	The SEA objectives of the WRMP should take the long-term ambitions in this document into account.
The Water Resources Management Plan Regulations 2007	
This provides the legislation for the preparation of water resources management plans.	The WRMP should take account of these requirements.
National Policy Statement for Wastewater (2012)	
This document sets out Government policy for the provision of major waste water infrastructure. The seven key policy objectives include: 1. Sustainable development; 2. Public health and environmental improvement; 3. To improve water quality in the natural environment; 4. To reduce water consumption; 5. To reduce the demand for waste water infrastructure capacity; 6. Climate change mitigation and adaptation; and 7. Waste hierarchy.	The SEA should seek to ensure that strategy objectives are also reflected in the SEA objectives particularly regarding maintaining, protecting and improving water quality across the region and ensure efficient use of resources.
Water UK (2016) Water Resource Planning Framework (2015-2065)	
This report details a strategic approach to securing water supplies by balancing enhanced supply infrastructure	The development of the WRMP, including decision-making processes should take the strategic advice

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
and demand management, based on consultation with companies, regulators, academics and NGOs.	of this report into account when prioritising its preferred schemes.
Defra (2018) Draft National Policy Statement for Water Resources Infrastructure (as amended per consultation in 2018 and 2019)	
The draft NPS sets out a framework for DEFRA and the Planning Inspectorate when considering development consent applications for nationally significant water resources infrastructure in England and Wales. Importantly, this policy document sets out the thresholds for assets including reservoirs, water transfers and desalination plants, which warrant application of the NSIP process.	The decision-making process for determining which schemes should be prioritised in the WRMP should take this policy document into account.
National Infrastructure Commission (2018) Preparing for a drier future: England's water infrastructure needs	
This document sets out the National Infrastructure Commission's advice on how to address England's water supply challenges and deliver the appropriate level of resilience for the long term. Included in this study are high level recommendations for demand management measures (including leakage reduction) and long-term investment needed in the water supply infrastructure for England and Wales.	The decision-making process for determining which schemes should be prioritised in the WRMP should take this policy document into account.
Environment Agency (2020) Meeting our future water needs: A national framework for water resources	
The national framework explores England's long term water needs for: • Public water supplies; • agriculture; • the power and industry sectors; and • environmental protection The national framework report marks a move to strategic regional planning, which would be comprised of 5 regional groups (made up of the 17 English water companies and other water users)	The WRMP should consider the needs of the whole region and of other water users, in line with the expectations of this policy paper.
HM Treasury (2020) National Infrastructure Strategy	
This Strategy sets out the government's plans to deliver on their ambition for a radical improvement in the quality of the UK's infrastructure and to put the UK on the path to net zero emissions by 2050. The planned investment in the water and flood risk management sector is illustrated in light of the 25 Year Environmental Plan and the second National Adaptation Programme.	The decision-making process for determining which schemes should be prioritised in the WRMP should take this policy document into account.
Regional	
Biodiversity Action Plans North York Moors National Park Biodiversity Action Plan 2013-2017 Yorkshire Dales National Park Local Biodiversity Action Plan (LBAP) 'Nature in the Dales: 2020 Vision'	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
Local biodiversity action plan objectives include those associated with maintaining and safeguarding the current extent of protected designations and recognised habitats and achieving favourable status for these areas.	The WRMP may have an effect on BAP objectives. The SEA should include objectives that take into account the objectives of the BAP where relevant (e.g. conservation designation status).
Yorkshire Dales National Park (2016) Local Plan 2015-2030	
The Yorkshire Dales Local Plan 2015 to 2030 is a strategy for new development in the National Park. It sets out local policy to steer development decisions and guide planning applications	The SEA should take the objectives of this plan into account.
Historic England, Heritage at Risk Register: North East & Yorkshire (2020)	
The Heritage at Risk Register is produced annually and documents the buildings and structures, places of worship, archaeological sites, battlefields, wrecks, parks and gardens, and conservation areas known to be at risk in the region.	It is unlikely the WRMP will have an effect on the Heritage at Risk Register.
Environment Agency (2016) Humber river basin district flood risk management plan 2015-2021	
Social objectives Understanding Flood Risk and Working in Partnership Community Preparedness and Resilience Reduce Community Disruption Flood Risk and Development Reduce risk to people Economic objectives Reduce economic damage Maintenance of main river and existing assets Transport Services Flood risk to agricultural land Tourism Environmental objectives Water Framework Directive Designated Nature Conservation Sites Designated Heritage sites Reservoir objectives Reservoir flood risk	The WRMP may have an effect on FRMP objectives. The SEA should include objectives that take into account the objectives of the FRMP where relevant (e.g. WFD status).
Environment Agency, CAMS (various)	
The Water Framework Directive's main objectives are to protect and enhance the water environment and ensure the sustainable use of water resources for economic and social development. Catchment Abstraction Management Strategies (CAMS) set out how we will manage the water resources of a catchment and contribute to implementing the WFD. CAMS contribute to the WFD by:	The WRMP operation may have the potential to affect several of the CAMs objectives. The SEA will include objectives that take into account the objectives of the CAMs where relevant.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
providing a water resource assessment of rivers, lakes, reservoirs, estuaries and groundwater referred to as water bodies under the WFD; identifying water bodies that fail flow conditions expected to support good ecological status; preventing deterioration of water body status due to new abstractions; providing results which inform River Basin Management Plans (RBMPs)	
Forest of Bowland AONB, Forest of Bowland Area of Outstanding Natural Beauty Management Plan 2019-2024	
Objectives include those associated with conserving and enhancing the AONB.	The WRMP operation may have the potential to affect several of the objectives for managing the Forest of Bowland AONB. The SEA will include objectives that take into account the objectives of the Forest of Bowland AONB management where relevant.
Hadrian's Wall Heritage Ltd, Hadrian's Wall Management Plan 2014 – 2019 (2014)	
Management of the world heritage site Boundaries of the world heritage site and its buffer zone Protection of the world heritage site Protection of undesignated archaeological remains Metal detecting Risk preparedness and disaster management Conservation of archaeological sites Rural land management Archaeological research Sustainable transport and physical access Developing the visitor experience and understanding of the world heritage site Sustainable development and prosperity Engaging with communities Marketing the world heritage site Education and learning	It is unlikely the WRMP will have an effect on the objectives of Hadrian's Wall Management Plan.
Howardian Hills AONB Joint Advisory Committee, Howardian Hills Area of Natural Beauty Management Plan 2019-2024	
Objectives include those associated with conserving and enhancing the AONB.	The WRMP operation may have the potential to affect several of the objectives for managing the Howardian Hills AONB. The SEA will include objectives that take into account the objectives of the Howardian Hills AONB management where relevant.
Lake District National Park Authority, A Vision for 2030 (2006)	
A prosperous economy	The WRMP may have an effect on the National Park objectives. The SEA should include objectives that

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
World class visitor experiences Vibrant communities A spectacular landscape, its wildlife and cultural heritage	take into account the objectives of the Lake District National Park where relevant (e.g. achieving excellent visitor experiences, spectacular landscape and wildlife).
Leeds City Council, Core Strategy (2019)	
Environmental objectives are listed below: Managing Environmental Resources: In safeguarding the environment of the District, the Core Strategy needs to: Protect natural habitats and take opportunities to enhance biodiversity through the creation of new habitats and by improving and extending wildlife corridors. Secure development which has regard to its impact on the local environment and is resilient to the consequences of climate change, including flood risk. Promote opportunities for low carbon and energy efficient heat and power, for both new and existing development. Make efficient use of natural resources, including the implementation of sustainable design and construction techniques, the use of minerals, and the effective minimisation and management of waste. Protect and enhance Green Infrastructure, strategic green corridors, green space, and areas of important landscape character, taking the opportunity to improve their quality, connectivity and accessibility through the development process.	The WRMP may have an effect on the Core Strategy objectives. The SEA should include objectives that take into account the objectives of Leeds Core Strategy where relevant (e.g. protecting natural habitats).
Leeds City Region Local Authority Green Infrastructure Strategies (2010)	
The plan aims to maintain and enhance green infrastructure to: Address climate change adaptation and mitigation Tackle flood alleviation and water management Improve quality of place Improve physical and mental health Sustain economic growth and investment	The SEA will take these objectives into account where the WRMP may have an effect on green infrastructure.
Natural England (2014) Site Improvement Plans (SIPs) for National Site Network	
Site improvement plans: Yorkshire & Humber This SIP includes the priorities and new measures required to achieve water-dependent National Site Network objectives under the Water Framework Directive. The actions in this SIP for the water dependent (excluding non-water dependent) habitats inform part of the River Basin Management Plan and its consultation. Specific objectives for each National Site Network site relating to species and habitats.	The WRMP may have an effect on Site Improvement Plans (SIPs) for National Site Network and the Humber RBMP. The SEA should include objectives that take into account the objectives of the National Site Network and the Humber RBMP where relevant (e.g. WFD status).
Natural England National Character Area (NCA) Profiles	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
There are over 20 NCAs within Yorkshire Waters operating boundary. Each of these have individual objective relating to specific landscapes, habitats and species. Generalised objectives for each of these include: Conserve characteristic historic structures Protect the area's rich and diverse archaeology Protect the area's high levels of tranquillity Protect, manage and enhance the good rights of way network Manage and enhance existing habitats Encourage the maintenance of traditional land management practices Protect, and encourage sympathetic management Protect and manage geological features Plan for climate change mitigation and adaptation	The WRMP may have an effect on NCAs. The SEA should include objectives that take into account the objectives of the NCAs where relevant (e.g. manage and enhance existing habitats).
Nidderdale AONB, Nidderdale Area of Outstanding Natural Beauty Management Plan 2019-2024	
Objectives include those associated with conserving and enhancing the AONB.	The WRMP operation may have the potential to affect several of the objectives for managing the Nidderdale AONB. The SEA will include objectives that take into account the objectives of the Nidderdale AONB management where relevant.
North East Local Enterprise Partnership (2019) More and Better Jobs: A strategic economic plan for the North East	
The plan lists aims to have 100,000 more jobs in the North-East by 2024. Reduce the gap in private sector employment density by 50% by 2024. Close the gap in the employment rate for people aged 16-64 by 100% by 2024. Reduce the gap in economic activity for people aged 16-64 by 50% by 2024. Reduce the gap in productivity by 50% by 2024.	Unlikely that these objectives will be effected by the objectives of the WRMP SEA.
North Pennines AONB Partnership, The North Pennines Area of Natural Beauty Management Plan 2019-2024	
Objectives include those associated with conserving and enhancing the AONB.	The WRMP operation may have the potential to affect several of the objectives for managing the North Pennines AONB. The SEA will include objectives that take into account the objectives of the North Pennines AONB management where relevant.
North York Moors (2016) Local Development Scheme	
Each Local Development Document produced will be subject to SEA/SA to ensure that they reflect the principles of sustainable development and that the	The WRMP operation may have the potential to affect the of the objectives of the LDS. The SEA will

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
effects of the document on sustainability can be monitored.	include objectives that take into account the objectives of the LDS where relevant.
North York Moors National Park Authority (2020) Local Plan	
The Environment based objectives of the plan are as follows: Secure high quality new development that is well designed, reinforces local distinctiveness and enhances the unique landscape character, settlement pattern and architecture of the National Park, including through protection of important views. Safeguard and improve the sense of tranquillity and remoteness in the National Park. Maintain and improve the darkness of night skies seen in the National Park. Conserve and, where appropriate enhance historic assets and protect valued open spaces within villages. Conserve and enhance the biodiversity and geodiversity of the National Park and improve habitat connectivity. Conserve and enhance soil, air and water quality. Reduce the causes of climate change and assist in the adaption to and mitigation of its effects including through promotion of sustainable design and efficient energy use in new buildings.	The SEA should take the objectives of this plan into account.
North York Moors Park Authority (2012) National Park Management Plan, (2016) Amendment Sheet	
The Plan aims to achieve the long-standing vision for the Park: A place managed with care and concern for future generations. A place where the diversity and distinctiveness of the landscape, villages and buildings is cherished. A place where biological and cultural diversity, and other special qualities are conserved and enhanced. A place where the environment and way of life is respected and understood. A place where communities are more self-sustaining and economic activity engenders environmental and recreational benefits. A place that is special to people and that provides pleasure, inspiration and spiritual well-being; where calm and quality of life are celebrated. A place where visitors are welcome and cultural and recreational opportunities and experiences are accessible. A place that continues to adapt to change whilst National Park purposes continue to be furthered and pursued. A place where natural resources are managed sustainably and environmental limits are recognised.	The WRMP operation may have the potential to affect the objectives of the National Park Management Plan. The SEA will include objectives that take into account the objectives of the National Park Management Plan where relevant.
Public Rights of Way Improvement Plans (ROWIPs)	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
Objectives include those associated with each local authority's rights of way improvement plans.	The WRMP operation may have the potential to affect the objectives of the ROWIPs. The SEA will include objectives that take into account the objectives of the ROWIPs where relevant.
Yorkshire Dales National Park Authority (2019) Yorkshire Dales National Park Management Plan 2019-2024	
By 2040, the Yorkshire Dales National Park will be: • A distinctive, living, working, cultural landscape that tells the on-going story of generations of people interacting with their environment; • A friendly, open, and welcoming place with outstanding opportunities to enjoy its special qualities; • Home to the finest variety of wildlife in England; • Resilient and responsive to the impacts of climate change, storing more carbon each year than it produces; • Providing an outstanding range of benefits for the nation based on its natural resources, landscape and cultural heritage, which underpin a flourishing local economy; • Home to strong, self-reliant and balanced communities with good access to the services they need.	The WRMP operation may have the potential to affect several of the ambitions for the management of the Yorkshire Dales National Park. SEA will include objectives that take into account the ambitions for the management of the Yorkshire Dales National Park where relevant (e.g. landscape quality and character, historic and cultural features, habitats and biological diversity, climate change and better use of resources).
Water Resources Management Plans from adjacent water companies	
These set out the plans to manage water resources by companies in adjacent areas.	The WRMP should not conflict with the other water company operations especially drought options that may be operated simultaneously.
Local	
WRMPs from adjacent water companies	
These include: Anglian Water Northumbrian Water Severn Trent Water United Utilities	The WRMP and SEA to take these into account.
River Restoration and Water Level Management Plans	
Natural England (2013) Restoring the River Wharfe SSSI: A River Restoration Plan Natural England (2010) Restoring the Yorkshire Derwent Environment Agency (2014) Pevensey Levels SSSI: Water Level Management Plan	The WRMP may have an effect on River Restoration Plans for non-National Site Network sites. The SEA should include objectives that take into account the objectives of these sites where relevant.

Appendix D - Environmental Baseline

1.1 Biodiversity, Fauna and Flora

1.1.1 Baseline

Biodiversity is the variety of plants (flora) and animals (fauna) in an area, and their associated habitats. The importance of preserving biodiversity is recognised from an international to a local level. Biodiversity has importance in its own right, and has value in terms of quality of life and amenity. The Yorkshire Water supply area includes a number of sites that are designated as important for biodiversity at an international level (**Figure D.** 1). Special Protection Areas (SPA)[2], Special Areas of Conservation (SAC)[3] and Ramsar[4] sites are listed in **Table D.** 1.

Table D.2 provides numbers of Sites of Special Scientific Interest (SSSI)[5] (these are also shown on **Figure D.** 1**)** and National Nature Reserves (NNRs)[6] within each WRZ in Yorkshire Water's supply area. SSSIs and NNRs relate to the country's best wildlife and geological sites.

Table D. 1 Special Protection Areas, Special Areas of Conservation and Ramsar within the Yorkshire Water supply area

Site and Designation	Water Resource Zone
SPA	
North York Moors	Grid; East
Hornsea Mere	Grid
Flamborough Head & Bempton Cliffs	Grid
Lower Derwent Valley	Grid
North Pennine Moors	Grid
Peak District Moors (South Pennine Moors Phase 1)	Grid and east of YW supply area
Humber Estuary	Grid and south/south east of YW supply area
South Pennine Moors Phase 2	Grid and east of YW supply area
Thorne & Hatfield Moors	Grid
North Pennine Moors	Grid and north of YW supply area
North Pennine Moors	Kielder (Tees transfer)
SAC	
Flamborough Head	East
Ingleborough Complex	Grid
Beast Cliff-Whitby (Robin Hood's Bay)	East
Lower Derwent Valley	Grid
Strensall Common	Grid
North Pennine Moors	Grid and north of YW supply
River Derwent	Grid
Kirk Deighton	Grid
Arnecliffe & Park Hole Woods	East
Ox Close	Grid
North York Moors	Grid; East ;and north of YW supply area

[2] Special Protection Areas (SPAs) are strictly protected sites classified in accordance with Article 4 of the EC Directive on the conservation of wild birds (79/409/EEC), also known as the Birds Directive, which came into force in April 1979. They are classified for rare and vulnerable birds, listed in Annex I to the Birds Directive, and for regularly occurring migratory species. www.jncc.org.uk
[3] Special Areas of Conservation (SACs) are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended). www.jncc.org.uk
[4] Ramsar sites are wetlands of international importance designated under the Ramsar Convention.
[5] Natural England has responsibility for identifying and protecting the SSSIs in England under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000). www.naturalengland.org.uk
[6] NNRs are protected under Sections 16 to 29 of the National Parks and Access to the Countryside Act, 1949 and the Wildlife and Countryside Act, 1981.

Site and Designation	Water Resource Zone
Craven Limestone Complex	Grid
Skipwith Common	Grid
North Pennine Dales Meadows	Grid and west of YW supply area
Ellers Wood & Sand Dale	East
Fen Bog	East
South Pennine Moors	Grid and west/south west of YW supply area
Hatfield Moor	Grid
Denby Grange Colliery Ponds	Grid
Thorne Moor	Grid
Humber Estuary	Grid and south/south east of YW supply area
River Eden	Directly north of Grid
Rochdale Canal	~4km West of Grid
Asby Complex	~3km North of Grid
Border Mires, Kielder-Butterburn	Kielder (Tees transfer options)
North Pennines Dales Meadows	Kielder (Tees transfer options)
Tyne & Allen River Gravels	Kielder (Tees transfer options)
North Pennines Moors	Kielder (Tees transfer options)
Ramsar	
Malham Tarn	Grid
Humber Estuary	Grid and south/south East of YW supply area
Lower Derwent Valley	Grid

Table D.2 Nationally Designated Nature Conservation Sites

Water Resource Zone	Number of SSSIs	*Number of NNRs*
Grid East GW East SW	Total in Yorkshire Water supply area: 368	Total in Yorkshire Water supply area: 11
Kielder (Tees-Swale option – river transfer)	Total in Tees Swale Transfer 5km corridor: 33	Total in Tees Swale Transfer within 5km corridor: 1
Kielder (Tees-Swale option – pipe transfer)	Total in Tees Swale Transfer 5km corridor: 32	Total in Tees Swale Transfer within 5km corridor: 1

In addition to the NNRs listed above, there are 134 Local Nature Reserves (LNRs)[7] within the SEA Study Area. **Figure D.** 2 identifies NNRs and LNRs together with areas of Ancient Woodland. A number of non-statutory designated sites are also present in the region such as local wildlife sites (LWSs).

There are a range of designated Natural Environment and Rural Communities (NERC) Act Section 41 habitats within the Yorkshire Water supply area[8]. NERC habitats include rivers and streams, blanket bogs, reedbeds, fens and meadows. NERC priority species include:

- Otter
- Water vole
- Atlantic salmon
- European eel
- Sea/Brown trout
- River lamprey
- White clawed crayfish
- Snakeshead Fritillary
- Loddon Lilly
- Creeping Marshwort
- Narrow-leaved water-dropwort

[7] a LNR is a statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the Natural Environment and Rural Communities Act 2006, by principal local authorities.
[8] Defra (*accessed May 2021*) MAGIC Interactive map: Habitat Inventories (http://magic.defra.gov.uk/)

- River water-dropwort
- Fine-lined pea Mussel
- Freshwater Pea Mussel
- Depressed River Mussel
- Greater Water Parsnip
- Club-tailed Dragonfly
- Tassel Stonewort
- Desmoulins Whorl Snail
- Snipe
- Lapwing
- Natterer's Bat
- Daubenton's Bat
- Pipistrelle Bat.

Natural England has defined a series of 120 Natural Areas as a means to conserve nature in England. They are areas of countryside identified by the unique combination of physical attributes, wildlife, land use and culture. Key messages regarding habitat type relevant to the Yorkshire Water supply area are presented in **Table D.3** and **Table D.4.**

Table D.3 Natural Areas in the Yorkshire Water Supply Area

Natural Area	WRZ	Region	Key Features
North Pennines	Grid	Yorkshire	Expansive moorlands, grasslands and flower-rich meadows are important features; Upland bogs and acid grassland cover much of the area; The area attracts large numbers of insects, waders and birds of prey; Varied geology (including gorges, shakeholes, caves and pavements) and associated waterfalls are important features.
Tees Lowlands	Grid	North East	Low lying land adjacent to the River Tees; Grazing marsh, open water and wetlands are important features.
Yorkshire Dales	Grid	Yorkshire	Glaciated, upland landscape of rounded hills and moors; Geologically important karst limestone landforms, cave systems and exposures of carboniferous rocks with associated habitats of international importance.
Forest of Bowland	Grid	Yorkshire	The area is dominated by rolling heather moorland and blanket bog; Internationally important grouse and sheep populations;
Lancashire Plain and Valleys	Grid	Yorkshire	Intensively farmed area with arable, horticulture and dairy farming; Significant area for wintering waders and wildfowl due to the area's proximity to internationally important estuaries; Numerous field ponds supporting great crested newt populations; Water vole populations present in the network of field drains of the coastal plain.
Southern Pennines	Grid	Yorkshire/ North West	Upland areas of heather moorland, blanket bog and acid grassland are essential character of the area Internationally important populations of red grouse, curlew, merlin, golden plover, dunlin and short-eared owl.
Pennine Dales Fringe	Grid	Yorkshire	Rolling landscapes at the transition between the Pennines and Yorkshire Dales.
Vale of York and Mowbray	Grid	Yorkshire	Riverine habitats such as Lower Derwent Valley supporting internationally important flood meadow grasslands and breeding/wintering bird populations; Important heathland areas.

Natural Area	WRZ	Region	Key Features
North York Moors and Hills	Grid; East	Yorkshire	Large expanse of open heather moorland, supporting vegetation and breeding birds (in particular Golden Plover and Merlin); Species-rich limestone grassland and calcareous fens on southern fringe of the area.
Vale of Pickering	Grid; East	Yorkshire	Floodplain grasslands (supported by the River Derwent) which are particularly important for breeding and wintering bird populations.
Yorkshire Wolds	Grid; East	Yorkshire	Crescent-shaped area of hills with near-vertical cliffs; Small spring-fed flushes arising from the Western escarpment and the coastal parts of the Wolds.

Figure D. 1 International Ecological Designations

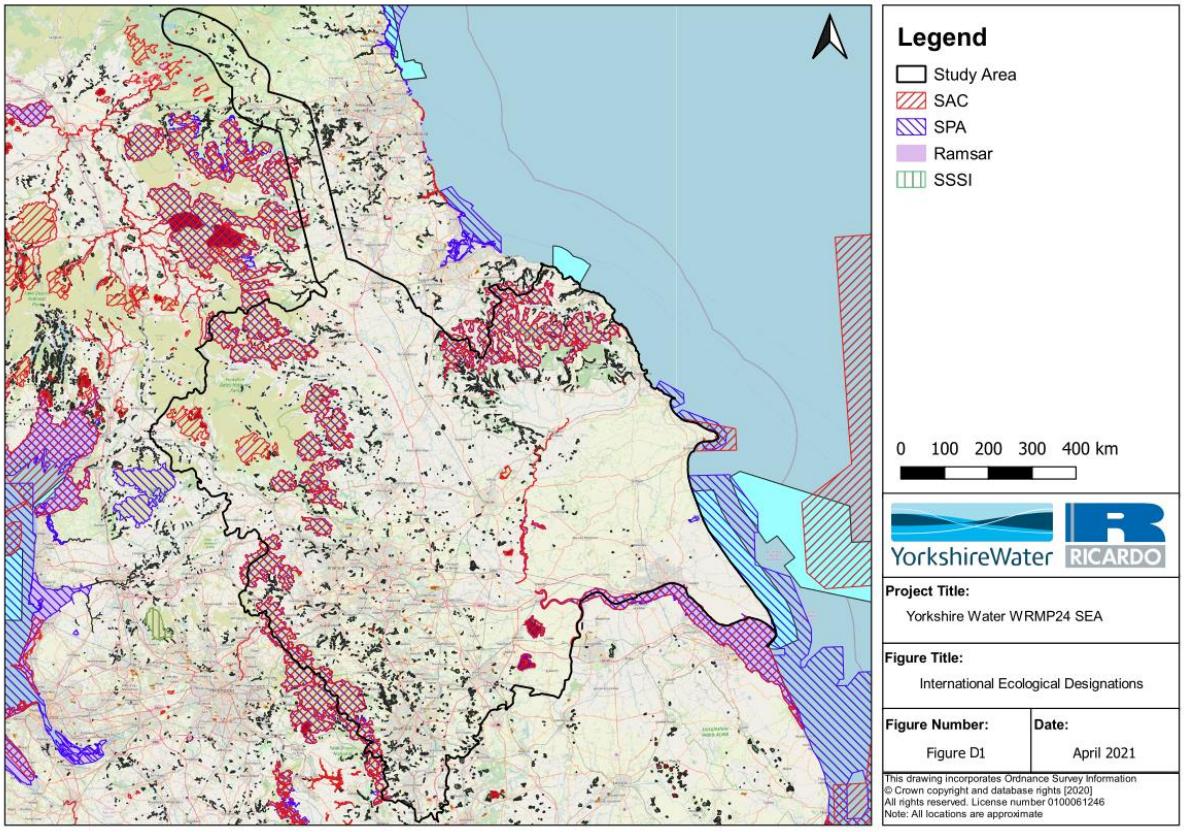


Figure D. 2 National Ecological Designations

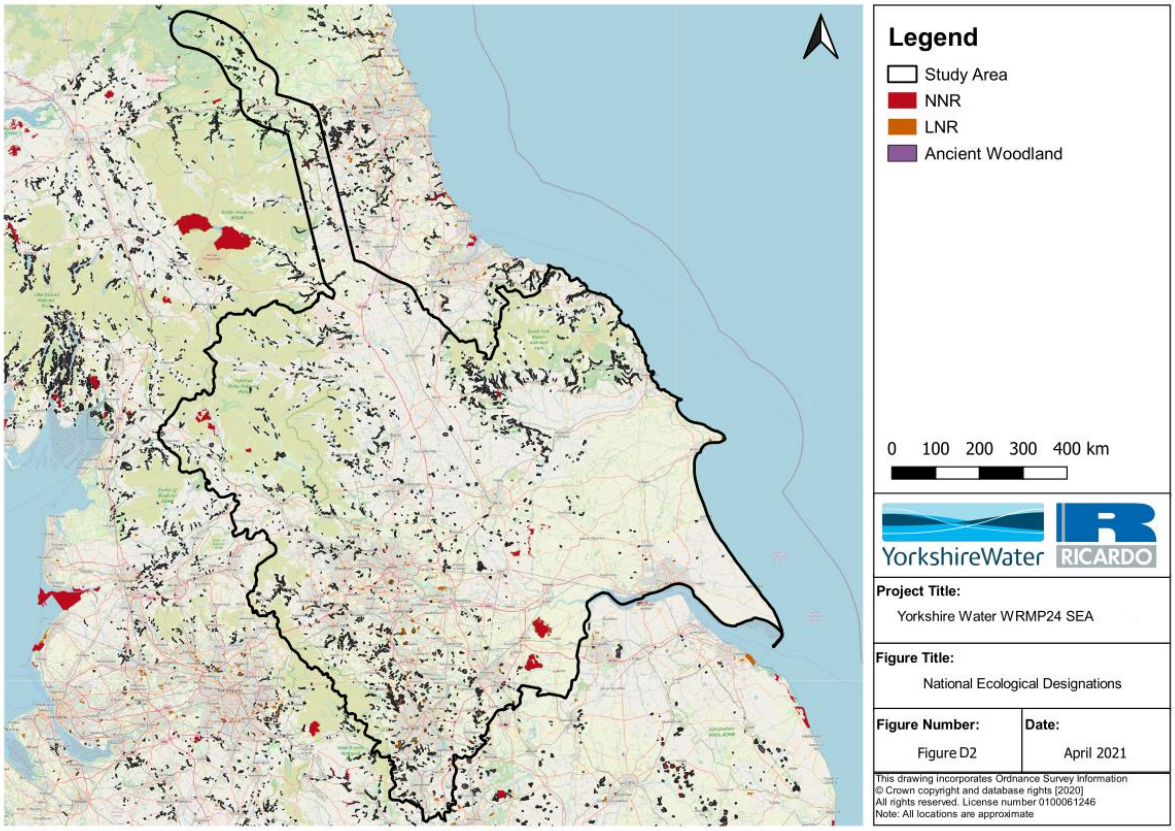


Table D.4 Natural England Natural Areas within the Tees-Swale Corridor

Natural Area	WRZ	Region	Key Messages
Holderness	Grid; East	Yorkshire	Low lying plain of boulder clay, with areas of gravel and sand; Area supports a variety of wildlife associated with the river Hull and adjacent wetlands.
Humber Estuary	Grid	Yorkshire	Internationally important site Migratory wildfowl, Vast expanses of exposed mudflats.
Humberhead Levels	Grid	Yorkshire	Plains dominated by major river systems (Ouse and Trent); Peatland areas internationally important for their nature conservation features.
Southern Magnesian Limestone	Grid	Yorkshire	Base-rich flushes, river and streams forming important wetland features; Important geological sections including limestone gorges and caves containing Pleistocene sediments.
Coal Measures	Grid	Yorkshire	Area characterised by dense populations of towns/cities developed as a result of underlying coal fields (Shales and sandstones of late Carboniferous age c. 320-295 million years old).
Dark Peak	Grid	Yorkshire	Area of peat covered hills dissected by narrow cloughs; Dominated by upland heather and blanket bog; Reservoirs are key characteristic feature of the area.
Derbyshire Peak Fringe and Lower Derwent	Grid	Yorkshire	Area dominated by rivers and reservoirs providing important habitats for pondweeds, great crested newts, migrating waders and wildfowl.
Border Uplands	Kielder (NWL)	North East	Area of peat and glacial drift covered hills; Dominated by moorland and blanket bog; Rivers are of considerable ecological importance.

1.1.1.1 Invasive Non-native Species

Invasive non-native species are widespread across the river catchments of Yorkshire. These species include terrestrial plants such as Himalayan Balsam and Giant Hogweed; aquatic macrophytes such as Floating Pennywort and New Zealand Stonecrop; and; aquatic invertebrates, notably Signal Crayfish and Zebra Mussels. The distribution of invasive species will be assessed in the SEA Environmental Report and the spread of invasive species forms a key question with regards to biodiversity in Section 1.1.

1.1.2 Future Baseline

The Defra 25 Year Environment Plan[9] includes a commitment to restore restoring 75% terrestrial and freshwater protected sites to favourable condition and to create or restore 500,000 hectares of wildlife-rich habitat outside the protected site network, focusing on priority habitats as part of a wider set of land management changes providing extensive benefits. The 25 Year Plan also proposed an adoption of 'Biodiversity Net Gain' approach to development, an approach introduced into national planning policy in 2019 and which will be mandated by the upcoming Environment Bill.

The 25 year Plan also includes a commitment to support land management at landscape and catchment level and to support the adoption of long-term sustainable land management practices to significantly expand wildlife habitat and provide opportunities for species and ecosystem recovery.

Climate change is anticipated to have an impact on wildlife in the future by exacerbating existing pressures such as changes to the timing of seasonal activity, and water scarcity. It is acknowledged that there is a need to allow wildlife to adapt to the impacts of climate change. Climate may limit species' distributions indirectly though the impact of invasive species on native species along climatic gradients[10]. It will affect the abundance and diversity of natural enemies, competitors and species that constitute resources, as well as a species' ability to compete for resources or resist natural enemies.

[9] https://www.gov.uk/government/publications/25-year-environment-plan
[10] Pateman & Hodgson (2015) Biodiversity Climate change impacts report card technical paper. Available from: http://www.nerc.ac.uk/research/partnerships/lwec/products/report-cards/biodiversity/papers/source06/

1.1.3 Key Issues

The key sustainability issues arising from the baseline assessment for biodiversity are:

- The need to protect or enhance the region's biodiversity, particularly protected sites designated for nature conservation.
- The need to avoid activities likely to cause irreversible damage to natural heritage.
- The need to take opportunities to improve and not reduce connectivity between fragmented habitats.
- The need to control the spread of Invasive Non-Native Species (INNS).
- The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.

1.2 Population and Human Health

1.2.1 Baseline

1.2.1.1 Population

The greater North East region has centres of densely populated urban areas within a generally more sparsely populated wider area. Kingston upon Hull is the most densely populated area with a mid-2010 average population density of 3,600 people per km^2, compared to an average of 400 in England as a whole. When comparing population and household statistics and projections (**Table D.5**), it is important to note that whilst the population growth rate for the whole of England over the period 2001-2010 was 5.6%, Yorkshire and The Humber saw a greater increase of 6.5% whilst the North East saw a significantly lower growth rate of 2.6%.

Table D.5 Population and Household statistics and projections (millions)

Period	2010	2008	2030	2033	*% change over period*	
Region	Population	No. Households	Population	No. Households	Population	*No. Households*
Yorkshire and the Humber	5.3	2.2	6.2	2.9	16.5%	*31%*
North East of England	*2.3*	*1.1*	*2.8*	*1.3*	*8.2%*	*19%*

Population change is the function of natural change (difference between births and deaths) and net migration (the difference between the number of people moving into and out of an area). The balance of factors underlying population change varies by region. **Table D.5** above presents the projected population change throughout Yorkshire and the Humber and the North East of England, from 2010 to 2033. In Yorkshire and the Humber there is a predicted to be a large contribution to population change from international migration.

1.2.1.2 Human Health and Deprivation

The WRMP has the potential to influence quality of life, including human health, well- being, amenity and community, through actions to maintain essential water supplies for public use. There could be beneficial (e.g. actions to provide additional supply of water will help safeguard public health) or adverse impacts (e.g. noise and disruption from the construction of infrastructure).

In comparison to other regions of England, lowest regional life expectancy for both males and females in 2017 to 2019 was observed in the North East[11]. Life expectancy in Yorkshire and the Humber was also below the national average.

[11] Office for National Statistics (2020) Life expectancy for local areas of the UK:

It has been shown that, in some cases, people in disadvantaged areas experience greater exposure to negative impacts on human health including air pollution, flooding, and proximity to large industrial and waste management sites[12]. The Index of Multiple Deprivation combines a number of indicators, chosen to cover a range of economic, social and housing issues[13], into a single deprivation score for each Lower Super Output Area[14] in the UK. This allows each area to be ranked relative to one another according to their level of deprivation. The Indices are used widely to analyse patterns of deprivation, identify areas that would benefit from special initiatives or programmes and as a tool to determine eligibility for specific funding streams.

Data relating to drinking water quality, pollution incidents and air quality, which could also be affected by the WRMP, and as a result affect amenity and human health are covered in separate sections of this report.

1.2.1.3 Recreation and Tourism

The WRMP has the potential to affect areas with recreational value through increased abstraction from rivers and reservoirs. There are a variety of opportunities for recreation and tourism within the SEA study area. Many of the recreational and cultural offerings are represented in other topic areas in the baseline. For example, the WRZs include a number of water resources of recreational importance including many reservoirs for sailing or fishing and river sections of particular importance with respect to navigation (e.g. The River Ouse) and angling (e.g. The River Ure). Section 1.1 identifies the large number of nature reserves that are present within the SEA study area. Section 1.7 identifies the importance of the study area with respect to heritage assets, including two internationally recognised World Heritage Sites[15] (plus a further one when considering the Tees Swale Transfer), 131 Registered Parks and Gardens (plus a further 11 when considering the Tees Swale Transfer) and 2,934 Scheduled Monuments (plus a further 178 when considering the Tees Swale Transfer).

Section 1.8 describes the landscape baseline, which includes three Areas of Outstanding Natural Beauty (AONB) (plus a further one when considering the Tees Swale Transfer). Public open space, Rights of Way, walking routes or cycle routes are also important with respect to recreation and tourism. The National Planning Policy Framework (NPPF)[16] states planning policies should protect and enhance public rights of way and access.

1.2.1.4 Economy and Employment

Both the Yorkshire and the Humber and North East regions are polycentric areas with a large and diverse economy. Traditionally, these regions have been dominated by heavy industries such as mining and manufacturing and whilst the latter remains an important component of both regional economies, evidence suggests these regions are transitioning to more diversified business sectors.

Gross value added (GVA) is an indicator that has been developed to measure the economic contribution of individual firms, industries or sectors in the United Kingdom. In 2017, The GVA for Yorkshire and the Humber and the North East was £116,772 billion and £53,235 billion, respectively, which translates to £21,426 and £20,129 per head[17]. These were between 27-36% below the UK national average of £27,555 per person.

Tourism is the fifth largest industry in the UK and supports 3.1 million jobs in England (forming England's third largest employer), contributing nearly £126.9 billion to the economy[18]. In 2014, there were >6

[12] Defra (2006) Air Quality and Social Deprivation in the UK: an environmental inequalities analysis
[13] Income Deprivation, Employment Deprivation, Health Deprivation and Disability, Education Skills and Training Deprivation, Barriers to Housing and Services, Living Environment Deprivation, and Crime.
[14] Super Output Areas (SOAS) are a set of geographical areas developed following the 2001 census. The aim was to produce a set of areas of consistent size, whose boundaries would not change, suitable for the publication data of such as the Indices of Deprivation. They are an aggregation of adjacent Output Areas with similar social characteristics. Lower Layer Super Output Areas (LSOAs) typically contain 4 to 6 OAs with a population of around 1500.
[15] World Heritage Sites are places of international importance for the conservation of mankind's cultural and natural heritage. The World Heritage List was set up by the World Heritage Convention, established by UNESCO in 1972. www.english-heritage.org.uk
[16] Communities and Local Government (2012) National Policy Planning Framework
[17] ONS (2018) Regional economic activity by gross value added (balanced) UK.
[18] Deloitte (2013) The Economic Contribution of the Visitor Economy: UK and the Nations. London

million visitors to the top 20 paid attractions in Yorkshire and Humberside, generating over £100 million in spend[19].

Nevertheless, the average gross weekly earnings for full-time employees in the Yorkshire and the Humber in 2019 was £538 and £533 for the North East, which are both below the national average of £585/week[20]. Unemployment rates for the regions were above the national average in 2018 (4.0%) at between 5.0 and 5.5%. However, between 2017 and 2018, Yorkshire and the Humber saw the second largest regional increase in employment rates (1.1%) meanwhile the North East saw a decrease of 0.5%[21].

The COVID-19 pandemic has impacted the economy in numerous ways; from lockdown restrictions forcing the closure of businesses to limits on mobility. In 2020 UK Gross Domestic Product (GDP) fell by 9.8%, the steepest decline since consistent records began in 1948[22]. Economists differ in how quickly they expect the economy to recover, however average forecast is for GDP growth of 4.8% in 2021. When the economic shock of the pandemic does dissipate it is likely that the crisis will result in lasting damage to the economy.

1.2.2 Future Baseline

Population is expected to grow at a rate between 8.2% and 16.5% across the region (see **Table D.5**), with an increasing proportion of people at or above state pension age. Household projections show potential increases of between 19% and 31% across the region, with an increasing proportion of one person households[23].

In response to recent studies access to the recreational resources, green spaces and the historic environment will have greater importance in future planning[24]. The NPPF suggests a range of areas that should be taken into account, including the provision of appropriate facilities for recreation that preserve the openness of the green belt.

The National Ecosystem Assessment and the Marmot Review, Fair Society, Healthy Lives, demonstrate the positive impact that nature has on mental and physical health and as a result the Government intends to establish a Green Infrastructure[25] Partnership with civil society to support the development of green infrastructure in England.

Improvements to the quality of the water environment and certain potential climate change impacts will present opportunities for an expanding tourist industry in the region[26].

1.2.3 Key Issues

The key sustainability issues arising from the baseline assessment for population and human health are:

- The need to ensure water supplies remain affordable especially for deprived or vulnerable communities.
- The need to ensure continued improvements in levels of health across the region, particularly in urban areas and deprived areas.
- The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures.
- The need to ensure water quantity and quality is maintained for other users including tourists, recreational users and other users such as farmers.

[19] Visit England (2010) Yorkshire and the Humber Regional Summary – Research and Highlights https://www.visitbritain.org/sites/default/files/vb-corporate/Documents-Library/documents/England-documents/most_visited_20_paid_yorks_humber_2014.pdf
[20] ONS (2019) Employee earnings in the UK:2019
[21] ONS (2019) Regional labour market statistics in the UK: January 2019
[22] House of Commons Library (2021) Coronavirus: Economic Impact
[23] ONS (2010) Housing Statistical Release - Household Projections 2008 to 2033, England.
[24] Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White Paper
[25] Green infrastructure is a term used to refer to the living network of green spaces, water and other environmental features in both urban and rural areas.
[26] Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report.

- The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to recreation resources and the natural and historic environment.
- The need to accommodate an increasing population.
- The need to contribute towards maintaining sustainable growth in the region.
- Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and well-being and the economy.

1.3 Material Assets and Resource Use

1.3.1 Baseline

1.3.1.1 Water Use

In 2018/19, Yorkshire Water abstracted and treated 1,300Ml/d (million litres per day) of water for supply to customers, with leakage from the water distribution system for 2014/15 reported as 289.8Ml/d[27].

1.3.1.2 Resource use and waste

The need for society to reduce the amount of waste it generates, by using materials more efficiently, and improving the management of waste that is produced, in order to achieve sustainable living, is realised more today than it was a decade ago.

Landfill volumes in England[28] peaked in 2001/02 at 22.4 million metric tons, before declining in the following years. In 2018/19, this figure was 2.7 million tons attributed to increased recycling rates. Household recycling rates in England have climbed to almost 45% (from 11.2% in 2000); waste generated by businesses declined by 29% in the six years to 2009 and business recycling rates are above 50%[29]. Average recycling rates for 2018/19 in the North East were 36.4% and 42.1% in Yorkshire and the Humber, both lower than the average for England of 43.8%[30]. In line with the widely adopted 'waste hierarchy', best practice for waste management is to reduce, re-use, recycle and recover, and only then should disposal (or storage) in landfill be considered.

Data on waste arisings is collected in a range of categories. The activities of the water industry contribute to construction, demolition and excavation waste, through construction of new infrastructure. The water industry also contributes to several waste streams through the operation of facilities. Waste streams include commercial and industrial waste (statistics include waste arisings from the power and utilities sector, which include water supply and sewage treatment), and also hazardous wastes from industrial wastewater treatment. **Table D.** 6 shows the latest available data for waste arising by region.

Table D. 6 Waste Arisings by Region

Waste Figures	North East	*Yorkshire and The Humber*
Commercial and Industrial waste arisings produced in region (million tonnes) (2009)	2.4	*6.9*
Construction & Demolition Environmental Waste (2006)	4.8	*10.4*
Total waste produced by region (2006)	*12.2*	*30.2*

The Yorkshire and The Humber region is a major producer and consumer of energy. Total energy consumption in the region during 2017 was just over 12 million tonnes of oil (mtoe), approximately 9.6%

[27] Yorkshire Water Services Limited (2019) Annual Report and Financial Statements. https://www.yorkshirewater.com/media/1819/734104_yws_arfs_2019_web-min.pdf
[28] Collected by Local Authorities
[29] Defra (2011) Government Review of Waste Policy in England 2011
[30] Defra (2019) Statistics on waste managed by local authorities in England in 2018/19

of the total UK figure[31]. In both the North East and Yorkshire regions the proportion of energy consumption used for industry and commercial use is above the UK average. This is consistent with national trends, with the majority coming from natural gas and petroleum. The renewable energy sector in both regions continues to grow with 11% of sites generating renewable energy in England (including offshore sources) located in Yorkshire and the Humber[32].

WRMP options which involve construction activities will result in the use of raw materials and the production of waste. The operation of options may result in the use of additional power and/or treatment chemicals and production of waste.

1.3.2 Future Baseline

The Government's National Infrastructure Strategy[33] (2020) outlines a legal commitment to decarbonise the economy by 2050, strategies to rebuild the economy following the COVID-19 pandemic and plans to 'level-up' UK cities and regional powerhouses. Plans for green-growth clusters in formerly industrial areas and investment via the Towns Fund could benefit the Yorkshire region in terms of the economy, industry, resource usage and the built environment. The UK Government plans to accelerate the deployment of green technology through private sector investment in the retrofitting of existing stock, carbon capture and low-carbon hydrogen.

Yorkshire Water's current economic level of leakage target is to reduce its regional level of water leakage from to 297.1Ml/d. By 2018/19, the target leakage is reduced by 5Ml/d to 292.1Ml/d, with a further reduction to 287.1Ml/d in 2019/2020. Yorkshire Water's water resources plan for 2024 will include updated projections and targets for per capita water consumption, commercial demand for water and the social and economic level of leakage targets over the next 25 years.

1.3.3 Key Issues

The key sustainability issues arising from the baseline assessment for Material Assets and Resource Use are:

- The need to minimise the consumption of resources, including water and energy.
- The need to reduce the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- The need to continue to reduce leakage from the water supply system.
- Daily consumption of water is higher than the national average in the area and consequently there is a continued need to encourage more efficient water use.
- The need to support regional and national commitments to decarbonisation.

1.4 Water

1.4.1 Baseline

In the context of the Water Framework Directive (WFD), the water environment includes rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile. The YW WRMP region is part of the Humber River Basin district.

The aquatic environment of the Humber River Basin has been characterised as part of the UK Government's reporting obligations to the EU under the WFD and this provides the most appropriate baseline reference[34].

The WFD brings together the planning processes of a range of other European Directives. These Directives establish protected areas to manage water, nutrients, chemicals, economically significant species, and wildlife – and have been brought into line with the planning timescales of the WFD.

[31] HM Treasury (2020) National Infrastructure Strategy
[32] Department for Business, Energy & Industrial Strategy (2018) Regional Renewable Statistics 2003-2018: Number of Sites
[33] HM Treasury Infrastructure UK (2020). National Infrastructure Strategy https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938539/NIS_Report_Web_Accessible.pdf
[34] Defra (2005) Water Framework Directive: Summary report of the characterisation, impacts and economics analyses required by Article 5, Humber River Basin District

Although the UK has left the European Union, European Law and policy has formed the basis for UK environmental laws and contributed to the direction of UK policy in these areas for many years up to 30 January 2020. As such, the WFD is considered to remain a useful contextual frame for this baseline review.

1.4.1.1 Surface Waters: Rivers and Canals

The Yorkshire Water supply area lies within the Humber River Basin District and is comprised of the following catchments[35]:

- Esk & Coast
- Swale, Ure, Nidd and Upper Ouse
- Derwent (Humber)
- Hull and East Riding
- Aire and Calder
- Don and Rother.

A large canal network extends from the Southern section of Yorkshire Water's supply area as far as Ripon in the North West and Driffield in the East.

Elements of the Tees Swale Transfer option are located with the Northumbrian River Basin District and is comprised of the following relevant catchments:

- Tees
- Wear
- Tyne.

Approximately 30% of Yorkshire Water's supply is derived from rivers[36]. Major rivers within the Yorkshire Water supply area include the Wharfe, Ouse and Derwent.

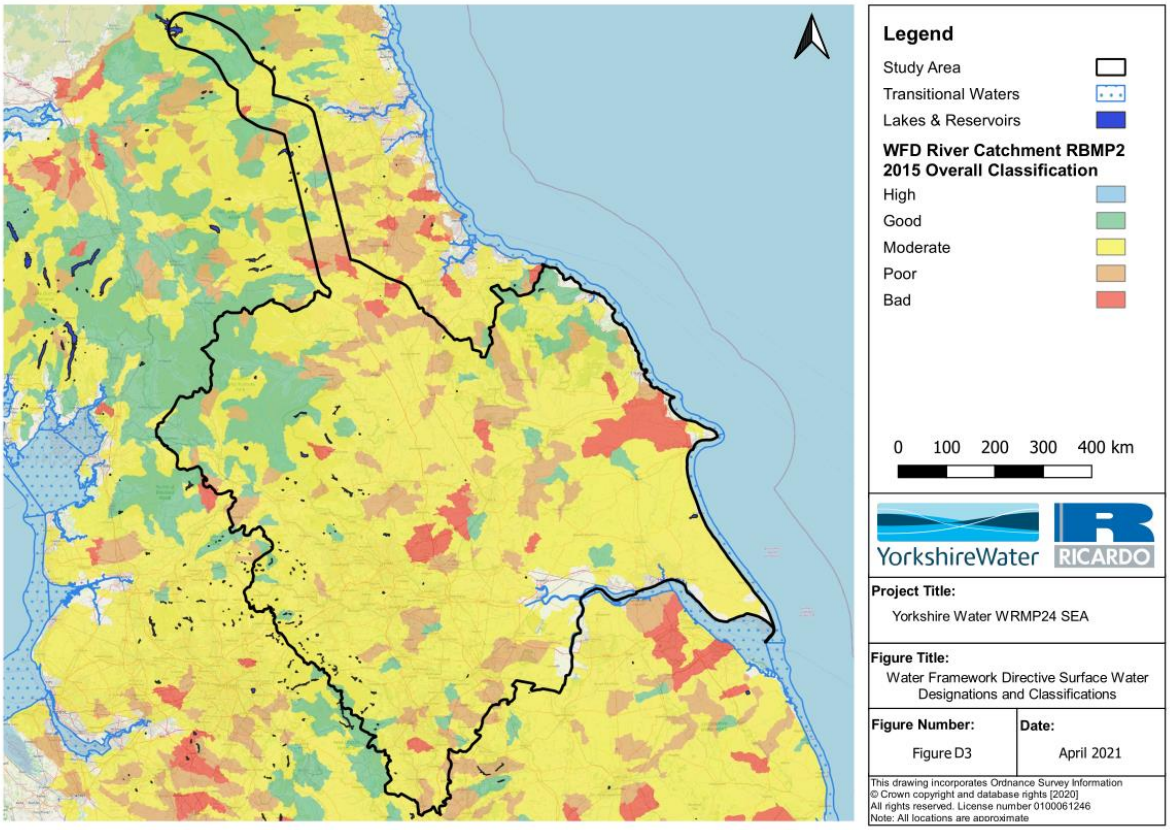
1.4.1.2 Surface Waters: Lakes and Reservoirs

The Humber river basin district covers an area of 26,100km^2 and is made up of 15 management catchments which have undergone varying levels of urbanisation and industrialisation and range from upland streams and fertile river valleys, to chalk aquifers. The waterbodies within the river basin district provide a diverse range of habitats and support species which are of both national and global importance.

There are a total of 136 lakes and reservoirs in the Humber River Basin District, of which two are natural water bodies, 22 are artificial water bodies and 108 heavily modified water bodies.
Approximately 45% of Yorkshire Water's supply is from impounding reservoirs. Many of these reservoirs are important landscape characteristics and often provide nationally/internationally important recreational resources and wildlife habitats. **Figure D.** 3 shows the location of lakes and reservoirs within the SEA study area.

[35] Environment Agency (2015) Part 1: Humber river basin direct river basin management plan
[36] Yorkshire Water Services Limited (2014) Water Resources Management Plan 2010 - 2035

Figure D. 3 Water Framework Directive Surface Water Designations and Classifications



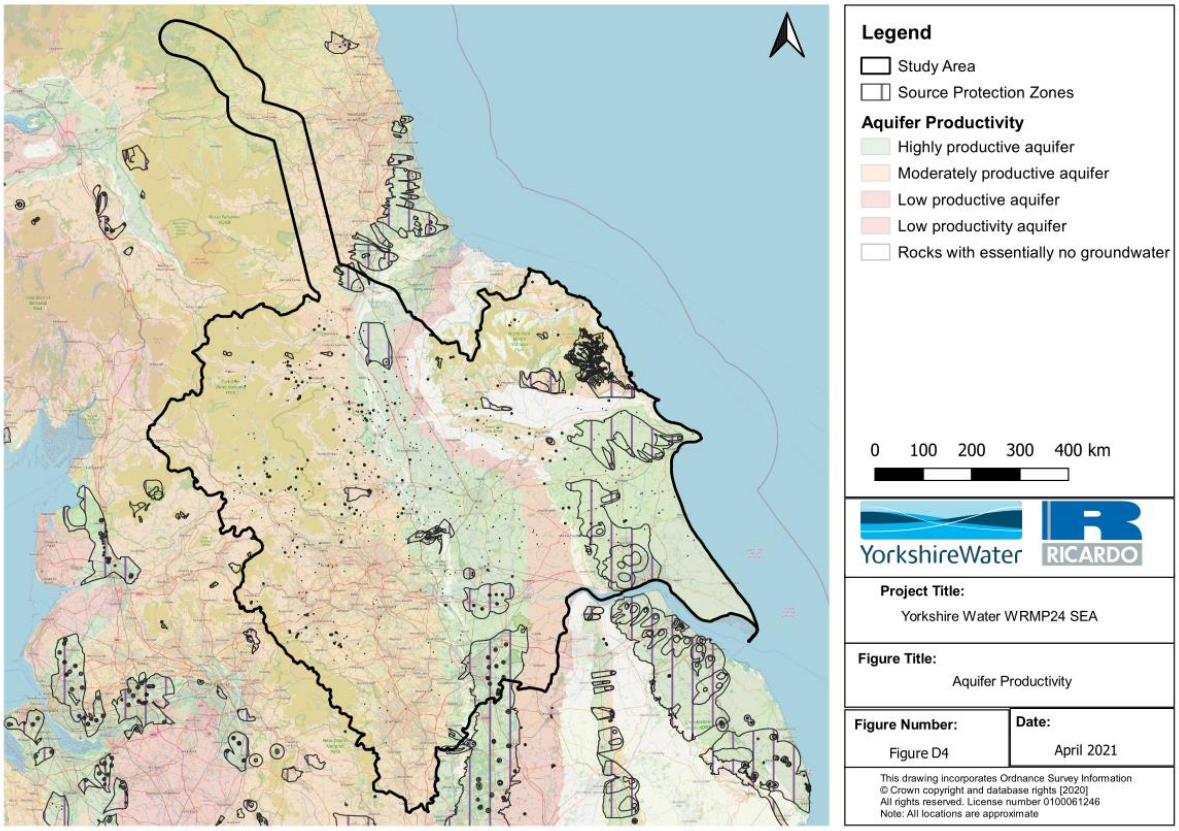
1.4.1.3 Groundwater

Approximately 25% of Yorkshire Water's supply is from groundwaters, derived from assets within the Grid SWZ or East SWZ. There are two major aquifers in the region, the Sherwood Sandstone and the Magnesian Limestone, supporting large groundwater abstractions. The Sherwood Sandstone is a major drinking water supply. **Figure D.4** shows the productivity of aquifers in the region.

Under the WFD, there are two separate classifications for groundwater bodies; chemical status and quantitative status. A groundwater body will be classified as having poor quantitative status where: low groundwater levels are responsible for an adverse impact on rivers and wetlands normally reliant on groundwater where abstraction of groundwater has led to saline intrusion where it is possible that the amount of groundwater abstracted will not be replaced each year by rainfall.

For a groundwater body to be at good status overall, both chemical status and quantitative status must be good.

Figure D.4 Aquifer Productivity



1.4.1.4 Estuaries

The Humber Basin has over 165 km of coastline and 33,000 km^2 of estuarine environments. The Yorkshire coastline provides a vital tourism industry to the region and there are 23 designated bathing waters in the Humber River Basin[37]. 100% of the estuaries within the Humber Estuary Operational catchment had good chemical water quality in 2015, whilst 33% were of good ecological status[38].

1.4.1.5 Monitoring

There is an adequate coverage of hydrometric and water quality data in the study area. In order for this to remain the case, the existing monitoring regime, undertaken by Yorkshire Water and the Environment Agency, should continue as at present.

1.4.1.6 Catchment Abstraction Management Strategies

A national review of abstraction licences was undertaken by the Environment Agency through the CAMS process in 2004. This has been revised in subsequent years, with the latest version for the Yorkshire region published in 2013[39]. Where applicable and relevant, updated CAMS information will be detailed in the Environmental Report if the data are made available.

CAMS areas are based on river catchment boundaries and overlap with Yorkshire Water's supply area, as summarised in **Table D.7**.

[37]Environment Agency (2015) Part 1: Humber river basin district River Basin management plan
[38] http://environment.data.gov.uk/catchment-planning/OperationalCatchment/3228/Summary
[39] https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process

Table D.7 Catchment Abstraction Management Strategies in the Yorkshire Water Supply Area

WRZ	Relevant CAMS
Grid	Aire & Calder; Don & Rother; Hull & East Riding; Swale, Ure, Nidd & Upper Ouse; Wharfe & Lower Ouse
East SW Zone	Esk & Coast
East GW Zone	Derwent; Hull & East Riding
Kielder (Tees transfer option)	Tees, Tyne & Wear

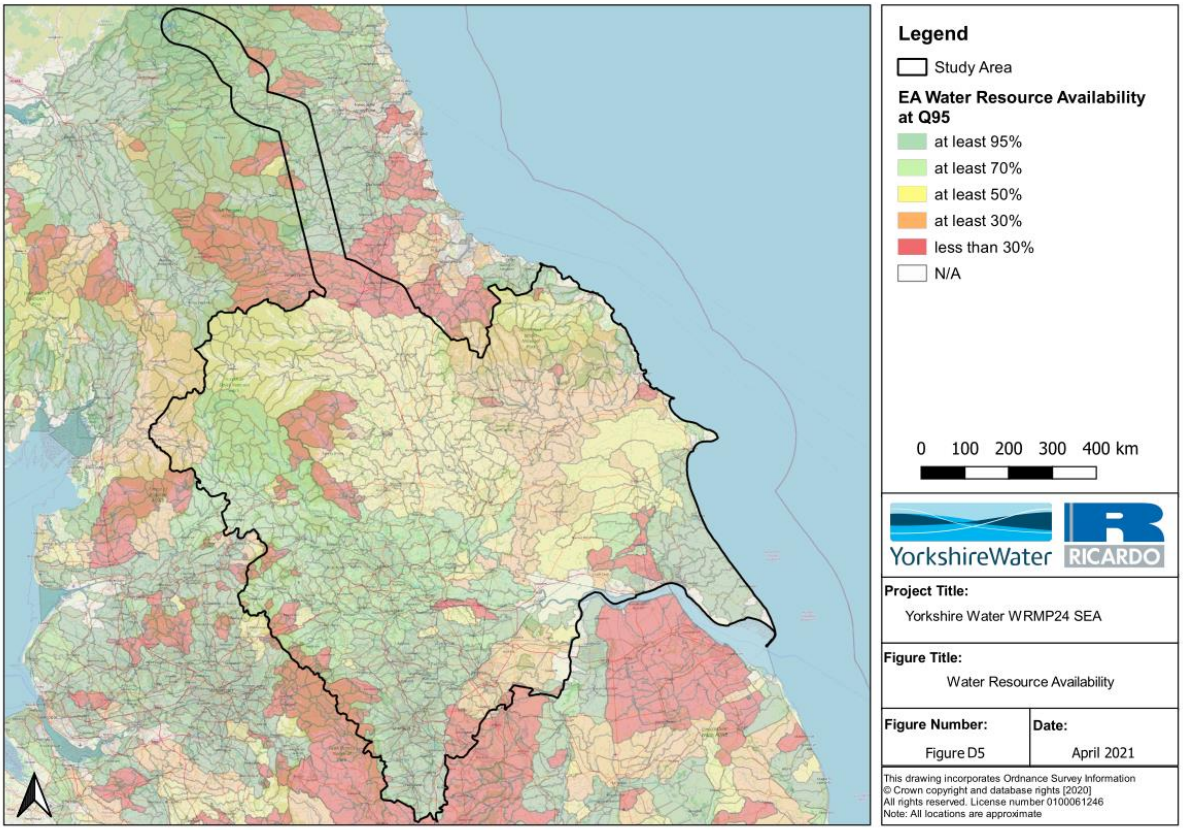
CAMS seek to identify where additional water abstractions can be made from the environment, where no additional abstractions can be made and where action is needed to address over-abstraction (or over-licensed resource allocation). **Table D.8** and **Figure D.5** show the resource availability status in SEA study area.

Table D.8 Resource Availability Status at Q95 flows in the Yorkshire Water Supply Area

CAMS	CAMS Management Unit	Resource availability status
Aire & Calder	1. Aire Headwaters	Water available
	2. Upper Aire	Water available
	3. River Worth	Water available
	4. Upper Mid Aire	Water available
	5. Lower Mid Aire	Water available
	6. Lower Aire	Water available
	7. Upper Calder	Water available
	8. Mid Calder	Water available
	9. River Colne	Water available
	10. Lower Calder	Water available
Don & Rother	1. Upper Rother	Water available
	2. Lower Rother	Water available
	3. River Sheaf	Water available
	4. Upper Don	Water available
	5. Middle Don	Water available
	6. Lower Dearne	Water available
	7. Upper Dearne	Water available
	8. Lower Went	Water available
	9. Went Walden Stubbs	Water available
Hull & East Riding	1. Kelk Beck	Restricted water available for licensing
	2. Upper West Beck	Water available
	3. Upper Hull	Water not available for licensing
	4. Driffield Canal	Water available
	5. Upper Mires Beck	Restricted water available for licensing
	6. Lower Mires Beck	No water available
	7. Rover Foulness	Water available
	8. Back Delfin	Restricted water available for licensing
	9. Market Weighton Canal	Water available
Wharfe & Lower Ouse	1. Addingham	Water available
	2. River Dibb	Water available (above Grimwith reservoir only)
	3. River Washburn	Water not available for licensing
	4. River Wharfe	Water available
	5. Tadcaster	Restricted water available for licensing
	6. Cock Beck	Water available
Swale, Ure, Nidd & Upper Ouse	1. Naburn	Restricted water available for licensing
	2. Foss	Water available
	3. Skelton	Water available

CAMS	CAMS Management Unit	Resource availability status
	4. Nidd	Water available
	5. Crimple	Water available
	6. Kyle	Water available
	7. Swale (confluence with Ure)	Water available
	8. Ure	Water not available for licensing
	9. Hunsingore	Water available
	10. Bat Bridge	Restricted water available for licensing
	11. Cod Beck	Water available
	12. Crakehill	Water available
	13. Westwick	Water not available for licensing
	14. Birstwith	Water not available for licensing
	15. Kilgram	Water available
	16. Wiske	Water available
	17. Bedale	Water available
	18. Swale at Morton	Restricted water available for licensing
Esk & Coast	1. Staithes	Restricted water available for licensing
	2. Upper Esk	Water available
	3. Lower Esk	Water not available for licensing
	4. Murk Esk	Restricted water available for licensing
Derwent	1. Ness	Restricted water available for licensing
	2. Howe Bridge	Restricted water available for licensing
	3. West Ayton	Water not available for licensing
	4. Low Marishes	Restricted water available for licensing
	5. River Hertford	Water not available for licensing
	6. Kirkham Bridge	Water available
	7. Buttercrambe	Water available
	8. Sutton upon Derwent	Restricted water available for licensing
	9. East Cottingworth	Water not available for licensing
	10. Barmby Tidal Barrage	Not assessed
Tees	1. Skerne	Restricted water available for licensing
	2. Leven	Water available
	3. Upper Tees	Water available
	4. Middle Tees	Water available
	5. Lower Tees	Water available
Tyne	1. River Team	Water available
	2. River Derwent	Water available
	3. Lower Tyne	Water available
	4. South Tyne	Water available
	5. River Allens	Water available
	6. North Tyne	Water available
	7. River Rede	Water available
Wear	1. Upper Wear	Water available
	2. Middle Wear	Water available
	3. Browney	Water available
	4. Lower Wear	Water available
	6. Gaunless	Water available

Figure D.5 Water Resource Availability



1.4.1.7 Water Quality

Historically water quality has been classified using the Environment Agency General Quality Assessment (GQA) classification. Since 2007, water quality has been monitored and classified according to WFD requirements.

For surface waterbodies there are two separate classifications, ecological and chemical. For a waterbody to be in overall ‘good’ status, both ecological and chemical status must be at least ‘good’. The ecological measures include water quality, quantity and the habitat, including the health of river insects and plants. These are scrutinised and an assessment made of the overall status. **Table D.9** summarises the key statistics for the catchments within the Yorkshire Water supply area and **Figure D. 3** shows the Overall Classification of River Waterbody Catchments. Similar data are being examined for catchments affected for the Tees transfer option.

Table D.9 Key statistics of WFD Catchment within the Yorkshire Water Supply Area

RBD	Relevant RBMP catchment	% at good ecological status or potential		% at good chemical status		*% at good status overall*	
		RBMP 2015	**Target 2021**	**RBMP 2015**	**Target 2021**	**RBMP2015**	***Target 2021***
Humber	Idle and Torne	9	9	91	91	9	*9*
	Derbyshire Derwent	27	31	84	85	25	*29*
	Derwent Humber	4	4	100	100	4	*14*
	Lower Trent and Erewash	6	12	100	100	6	*12*
	Wharfe and Lower Ouse	15	15	96	96	5	*15*
	Louth Grimsby & Ancholme	6	23	100	100	6	*23*
	Hull & East Riding	4	18	100	100	14	*18*
	Don and Rother	8	8	97	97	8	*8*
	Esk & Coast	50	57	100	100	50	*57*
	Swale, Ure, Nidd & Upper Ouse	15	16	95	95	15	*16*
	Aire & Calder	*6*	*6*	*99*	*99*	*6*	*6*

For groundwater, there are two separate classifications for groundwater bodies: chemical status and quantitative status. Each must be reported in addition to the overall groundwater body status. For a groundwater body to be at good status overall, both chemical status and quantitative status must be good. In addition to assessing status, there is also a requirement to identify and report where the quality of groundwater is deteriorating as a result of pollution and which may lead to a future deterioration in status. The Humber River Basin District RBMP reports that 89% of groundwater was assessed as at good quantitative status now and forecast to 2015.

Groundwaters are an important resource in the Humber River Basin District. A significant proportion of drinking water comes from the groundwaters of the chalk and sandstone. The main pressures on groundwaters are abstraction for drinking water supply and contamination with nitrates and pesticides. Historic mining in the west of the river basin on the coal measures has had a significant impact on the groundwater quality. Unsustainable abstraction from groundwater can lower groundwater levels and affect dependent river flows or wetlands, or can induce the intrusion of poorer quality water from the sea or from deeper aquifers.

The Environment Agency is undertaking a monitoring programme aimed at reducing the uncertainty in the classification of waterbodies. The number of uncertain failures is 9 %. The main reasons for failure, and the contribution of each, are presented in **Table D.10** below, which identifies 3% of waterbodies failing as a result of insufficient flow/abstraction.

Table D.10 Main Reasons for waterbodies failing to achieve good ecological status or potential

Reason for failure	Contribution (%)
Physical modification	11%
Diffuse source	31%
Flow	3%
Point source	35%
Suspect data	6%
Unknown reason (pending investigation)	9%
Other pressures	1%
INNS	0.2%
Natural	4%

Physical modifications, pollution from wastewater, and pollution from rural areas are reported as the most significant water management issues which affect water bodies within the Humber river basin district preventing them from achieving “Good” status.

Source Protection Zones (SPZ) provide additional protection to safeguard drinking water quality. This is achieved through constraining the proximity of an activity that may impact upon drinking water abstraction. They are defined around large and public potable groundwater abstraction sites, and the groundwater travel time to an abstraction. **Figure D.4** shows the source protection zones in the region.

1.4.1.8 Flood Risk

Flooding can result from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources. Across the country, the Government budgeted £2.3bn on 1,500 flood defence schemes between 2015 -2021. The Environment Agency’s Flooding in England report[40] highlights that regionally, Yorkshire and Humber has the second highest number of people at risk from flooding – approximately 78,000 properties in the region have a significant risk of surface water flooding and over 58,000 people at high risk of flooding from rivers and the sea. Nearly 300,000 properties in the Humber river basin district receive direct flood warnings.

East Riding of Yorkshire and the City of Kingston upon Hull, both within Yorkshire Water’s supply area, are the two local authorities in England with the highest number of properties with a chance of flooding.

Parts of the upland catchments are “rapid response areas” which pose a large risk to communities living nearby. There is a considerable extent of lowland in the river basin district, running north to south. Many of these areas are only a few metres above sea level, forming an extensive area of floodplain and wetland areas. The Humber Estuary has a large tidal range and people living on the coast and by the estuary are at risk from tidal flooding, as shown by the 2013 tidal surge. The coastline is prone to erosion from the sea along its entire length and in north Lincolnshire, sand dune systems and coastal have to be defended to prevent inland areas from flooding. Yorkshire communities identified by the flood management plan as being at risk from flooding include Calderdale, York and Hull.

The extreme floods of 2007 prompted the Pitt Review (2008) and the subsequent Flood and Water Management Act 2010 which in part regulates the implementation of sustainable drainage systems to increase infiltration and reduce flooding from surface water runoff.

In 2008-2009, the Environment Agency spent approximately £427 million on building, improving and keeping flood defences such as managed river channels, walls and raised embankments, flood barriers and pumps in good condition, which reduced the risk of flooding to over 176,000 households across England. The Government further recognised the importance of investing in flood risk and coastal management and there has been increased public spending on flood risk management over the period

[40] Environment Agency (2009) Flooding in England: A National Assessment of Flood Risk

2007-2012. Climate change may have a significant effect upon future flood risk in the region. This is discussed further below.

1.4.2 Future Baseline

The Water Framework Directive set a target of aiming to achieve at least 'good status' in all waterbodies by 2015. However, provided that certain conditions are satisfied, in some cases the achievement of good status may be delayed up until 2027. The NPPF states that inappropriate development in areas at risk of flooding (in Flood Zone 1[41], Flood Zone 2[42], Flood Zone 3a[43] or Flood Zone 3b - the functional floodplain); should be avoided by directing development away from areas at highest risk. The NPPF requires that where development is necessary, it should be made safe without increasing flood risk elsewhere, as defined in the Technical Guidance to the NPPF[44]. The NPPF requires the application of a sequential, risk-based approach (operated through Strategic Flood Risk Assessment) to the location of development to avoid where possible flood risk to people and property and to manage any residual risk, taking account of the impacts of climate change.

Following application of the Sequential Test, if it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. This includes development for water- compatible uses (e.g. water transmission infrastructure and pumping stations) and essential infrastructure (e.g. water treatment works that need to remain operational in times of flood). The Government's 25 year Environment Plan looks to strengthen the relevant protections in the NPPF and, in addition, focus on using more natural flood management solutions, increase the uptake of sustainable drainage systems and improve resilience and recovery times of at risk properties.

The Environment Agency has produced 77 Catchment Flood Risk Plans (CFMPs) for England and Wales. Through the CFMPs, inland flood risk across all of England and Wales has been assessed for the first time. The CFMP considers all types of inland flooding, from rivers, ground water, surface water and tidal flooding. The role of CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. This is essential if for effective investment decisions for the future and to help prepare ourselves effectively for the impact of drought events as a result of climate change. The CFMPs will help target the areas that are at greatest risk and provide information on the likely future flood risk, which will help establish the future baseline. For the Yorkshire Water supply region, the following CFMPs have been produced:

- River Esk and Coastal Streams
- River Derwent
- River Ouse
- River Hull & Coastal Streams
- River Aire
- River Calder
- River Don
- The River Tyne, River Wear and River Tees CFMPs will aid the future development of the Tees Transfer.

Yorkshire Water's 2019 Water Resource Management Plan[45] and its 2022 Drought Plan provide details on how water resources will be managed and secured for the future, including in response to the risks presented by climate change. The Water Resources Management Plan identifies that the Yorkshire Water region will remain in a water supply surplus until the mid 2030s. This reflects the current and forecast economic climate and associated impact on new development and water use.

[41] Low probability of river or sea flooding (<0.1%) which has critical drainage problems
[42] Medium probability of river (1%-0.1%) or sea flooding (0.5%-0.1%)
[43] High probability of river (>1%) or sea flooding (>0.5%)
[44] Ministry of Housing, Communities & Local Government (2014) Flood risk and coastal change. Accessed at https://www.gov.uk/guidance/flood-risk-and-coastal-change
[45] Yorkshire Water (2019), Water Resources Management Plan 2019-2035

The UK Climate Change Risk Assessment (CCRA) 2017 Evidence Report[46] draws together and interprets the evidence gathered by CCRA regarding current and future threats and opportunities for the UK posed by the impacts of climate change up until 2100. Findings of the assessment include:

- Increasing pressure on the UK's water resources due to changes in hydrological conditions, population growth and regulatory requirements to maintain good ecological status.
- Major supply-demand deficits were identified for five river basins including the Humber river basin district.
- Increases in water demand for irrigation of crops.
- Lower summer river flows across the UK due to warming and drying conditions.
- An increase in precipitation in winter months due to a combination of greater depths and more frequent heavy rainfall events suggesting runoff with potential negative impacts on flood risk and sewer overflows in urban environments.
- Flash-flooding associated releases from combine sewer overflows (CSO) could in turn increase associated illnesses at the coast due to the varying microbial pathogens in the marine environment.

1.4.3 Key Issues

The key issues arising from the baseline assessment for water are:

- The need to further improve the quality of the regions river, estuarine and coastal waters taking into account WFD status targets.
- The need to maintain the quantity and quality of groundwater resources taking into account WFD status targets.
- The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface waters and groundwaters.
- The need to ensure sustainable abstraction to protect the water environment.
- The need to ensure that people understand the value of water.
- The need to reduce and manage flood risk.

1.5 Soil, Geology and Land-use

1.5.1 Baseline

1.5.1.1 Geology

There is a great diversity in the composition of the geology across the region. The geology of North Yorkshire comprises a range of sedimentary rocks that slope gently to the east so that the oldest rocks are present in the west of the County and the youngest in the east. The Carboniferous Limestone and the overlying Upper Carboniferous Millstone Grit dominate the exposure in the west and give rise to the characteristic upland countryside of the Yorkshire Dales and the North Pennines. There is a distinctive difference in the two habitats that these rock types support; with limestone giving rise to calcareous soils whilst shales and sandstones of the Millstone Grit giving rise to acidic soils and large areas of upland grassland and bog. The South Yorkshire area is underlain by rocks of Carboniferous age which are tilted gently to the south-east so that the oldest part of the succession occurs in the west. The moors to the west of Sheffield are formed in the shales and hard coarse-grained sandstone beds of the Millstone Grit. The West Yorkshire area is underlain by rocks of Carboniferous age which are tilted gently to the south-east so that the oldest part of the succession occurs in the west. The moors to the west of Bradford and Calderdale are formed in the shales and hard coarse-grained sandstone beds of the Millstone Grit. The geology of the East Riding of Yorkshire represents a relatively simple arrangement with the older, marine clays, limestone and sandstones of Jurassic age occurring in the west of the County and younger Cretaceous rocks in the east. The topography of the area is dominated by the Chalk Wolds which are a crescent shaped series of hills stretching from the coast north of Bridlington to the Humber Bridge.

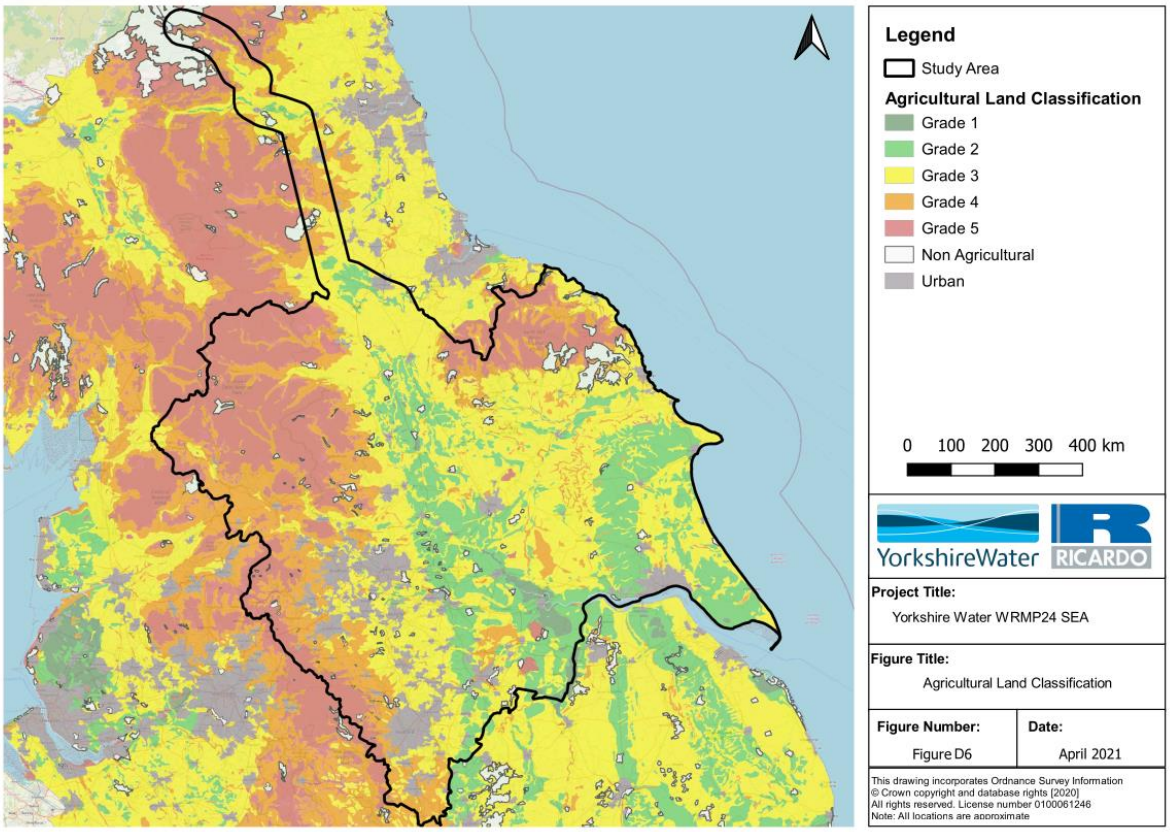
[46] Defra (2016) The UK Climate Change Risk Assessment 2017 Evidence Report

The variety of underlying geology in the region is reflected in the region's soils, the agricultural value of which varies across the region.

Arable and horticultural land is the predominant agricultural land use type in Yorkshire Water's supply region, with the majority of this land primarily located from the centre of the region to the east, with grazing and rough grassland confined mostly to the Peak District. There are pockets of dense shrub heathland present in the North Yorkshire Moors and Peak District. The Agricultural Land Classification System developed by Defra provides a method for assessing the quality of farmland, principally for the use in planning. The system divides the quality of land into five categories as well as non-agricultural and urban; the regional data is shown in **Figure D.6**.

The 'best and most versatile land' is generally defined as the agricultural land which falls into Grades 1, 2 and 3a. The 'best and most versatile' quality of the agricultural land is largely found to the east of the Pennines, in the Vale of York and north of Kingston upon Hull.

Figure D.6 Agricultural Land Classification



1.5.2 Future Baseline

One of the core planning principles of the National Policy Planning Framework (NPPF) is to encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value. The NPPF also places great importance with respect to Green Belt policy, the aim of which is to prevent urban sprawl by keeping land permanently open. Green Belt serves five purposes: to check the unrestricted sprawl of large built-up areas; to prevent neighbouring towns merging into one another; to assist in safeguarding the countryside from encroachment; to preserve the setting and special character of historic towns; and to assist in urban regeneration, by encouraging the recycling of derelict and other urban land. Although the NPPF promotes a presumption in favour of sustainable development, this does not apply where proposed developments may affect European or other designated sites covered by specific policies.

The 25 Year Environment Plan (2018) runs alongside the Industrial Strategy (2017) and outlines the government's approach to safeguarding the environment and sustainable management of the economy.

It introduces reforms to incentivised land management following Brexit. The plan details the Environmental Land Management scheme (ELMs), evolution of the Common Agricultural Policy (CAP). The ELMs include 3 new schemes designed to support the rural economy and the government's commitment to net zero emissions by 2050[47]. The first of these schemes, the Sustainable Farming Incentive, will pay farmers to manage their land in an environmentally sustainable way. The scheme designates standards based on a feature e.g. hedgerows or grassland, and contains a series of actions required to meet the criteria. The scheme is currently being piloted but is due to launch in 2022. The Local Nature Recovery Scheme is intended to encourage collaboration between farmers and will pay for actions that support nature recovery which meet local environmental priorities. The Local Nature Recovery Scheme is due to launch in 2024. Finally, the Landscape Recovery scheme support long-term projects to recover landscape and ecosystems. Examples of projects include the restoration of peatland and salt marshes, large-scale tree planting and the re-wilding of landscapes where appropriate. Again, this scheme is due to come online in 2024.

1.5.3 Key Issues

The key sustainability issues arising from the baseline assessment for soil, geology and land use are:

- The need to protect geological features of importance and maintain and enhance soil function and health.
- The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).
- The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region.

1.6 Air and Climate

1.6.1 Baseline

The schemes in the WRMP may involve construction, operation of abstraction and treatment operations in new locations and changes to the operation of such processes in existing locations. Therefore, there is the potential for adverse effects on air quality and climate through emissions associated with construction (on site and transport) or through the operation of the schemes.

The 2018 UK Climate Projections (UKCP18) are broadly consistent with UKCP09 and estimate that summers in the Yorkshire and Humber River Basin district are likely to become drier and winters wetter[48]. In northern and upland areas, an increase in the number of extreme rainfall events is estimated, as is the frequency of dry spells (over ten consecutive days without rain).

Future climate change will influence processes within the hydrological cycle such as runoff and evapotranspiration.

The UK Climate Change Risk Assessment (CCRA) 2017 Evidence Report[49] indicates an urgent need for early adaptation action (i.e. within the next 5 years) in managing water resources, particularly in areas with increasing water scarcity.

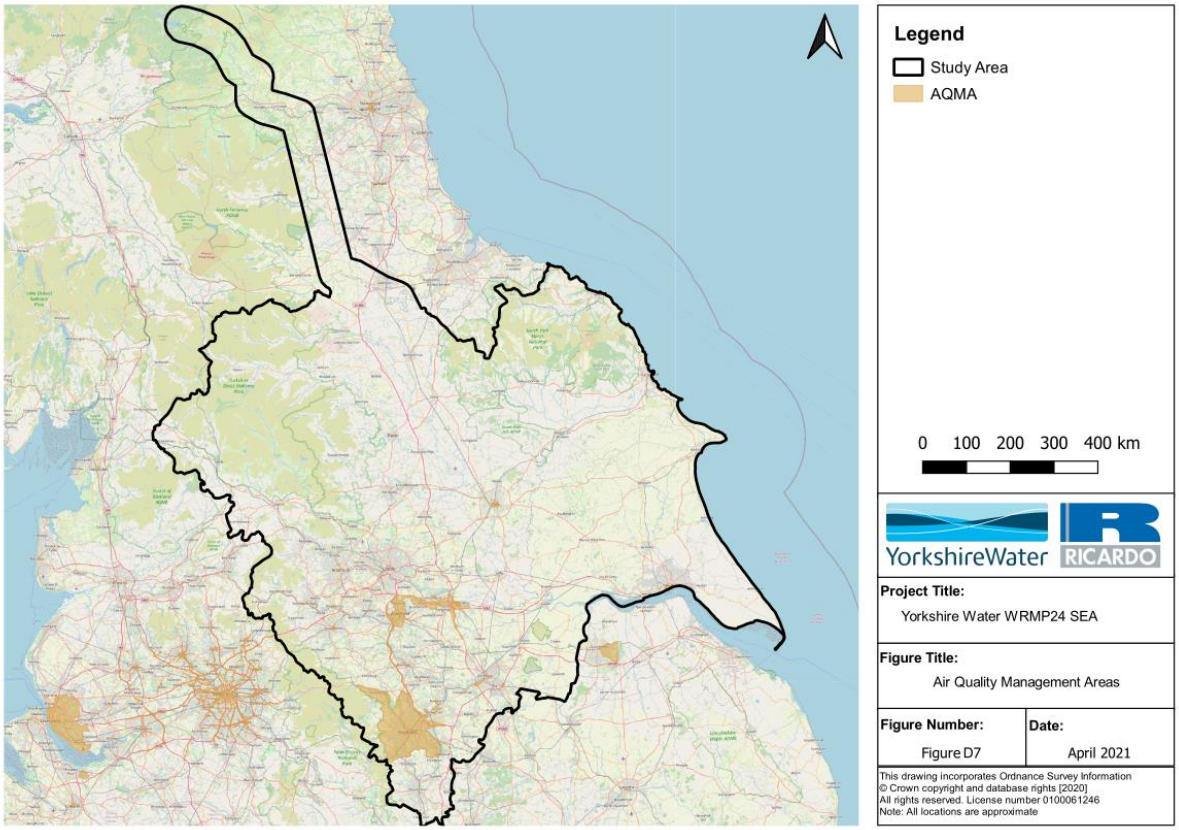
1.6.1.1 Local Air Quality

Options in the WRMP may require increased pumping of water (carbon emissions) and the construction of new infrastructure. Therefore, there is the potential for negative effects on air quality through emissions associated with construction requirements or through the operation of the options. The air quality baseline situation can be best described through reference to information produced by the local authorities in the Yorkshire Water WRZs that have declared Air Quality Management Areas (AQMA). These AQMAs are shown in **Figure D.7**. A local authority declares an AQMA when UK National air quality objectives are unlikely to be met. The majority of the AQMAs in the UK have been

[47] Defra (2021) Environmental Land Management scheme: overview
[48] UKCP18 https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-derived-projections.pdf
[49] Defra (2016) The UK Climate Change Risk Assessment 2017 Evidence Report

declared because of emissions from road transport. Reference to AQMAs will be made when considering any adverse on air quality of the WRMP options.

Figure D.7 Air Quality Management Areas



1.6.1.2 Climate

Climate monitoring and risk assessments have improved significantly over the last two decades but there are still limits to the understanding of future climate change impacts. Whatever happens to future 'greenhouse gas' emissions, there is already a certain amount of global warming "locked in" due to historic emissions due to the inertia and lags in the global climate system. Mitigation through reduction in greenhouse gas emissions will contribute to risk reduction over the long term (100 years). Adaptation is however needing to start now in order to reduce the costs and damages of potential impacts and to take advantage of opportunities that result from a changing climate.

The 2018 UK Climate Projections (UKCP18) are broadly consistent with UKCP09 and estimate that summers in the Yorkshire and Humber River Basin district are likely to become drier and winters wetter[50]. In northern and upland areas, an increase in the number of extreme rainfall events is estimated, as is the frequency of dry spells (over ten consecutive days without rain). The predominant greenhouse gas of interest is carbon dioxide (CO^2). National and regional CO^2 emissions totals and how they are apportioned to their source categories are provided in **Table D.11**.

[50] UKCP18 https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-derived-projections.pdf

Table D.11 UK CO2 emissions (2013)

Region	Total emissions (million tonnes CO2)	Per capita emissions (tonnes CO^2 per capita)	*Percentage Contribution by Source Sector* Industry & Commercial	Domestic	*Transport*
Yorkshire & The Humber	43.5	8.1	49.4%	26.0%	*23.9%*
North East	24.3	9.3	70.4%	22.6%	*17.7%*
UK	*445.9*	*7.0*	*44.2%*	*29.9%*	*27.3%*

Source: Department of Energy and Climate Change (DECC) (2015)[51]

There has been an 18% decrease in total emissions between 2005-2013 in the Yorkshire and the Humber region compared with the UK average of 16% decrease.

Future climate change will influence processes within the hydrological cycle such as runoff and evapotranspiration. The potential impact of climate change on Yorkshire Water's water resources in the future is summarised in **Table D.12**.

Table D.12 Impact of Climate Change on Water Resources

Sector		*Impact*
Water Resources	(i) water supply	*Reduction in water source yields, either in total or at certain times of the year.* *Increased evaporation losses from surface water stores.* *Increased sediment and pollution runoff into watercourses caused by changes in farm management practices adopted to adapt to climate change.* *Increased risk of algal blooms and pollution in reservoirs.*
	(ii) water demand	*Increase in demand in summer months leading to increase in average and peak requirements.* *Increased pressure on treatment and distribution system.*
Flood management		*Increased riverine flood risk and storm occurrence due to increased rainfall, leading to increased risk of flooding to water resource assets and adverse temporary effects on raw water quality.*
Water quality management		*Lowered water quality in lowland rivers, with implications for in-stream ecosystems and water abstractions.* *Altered potential for polluting incidents.*
Navigation		*Lower summer flows leading to reduced navigation opportunities in rivers and canals.*
Aquatic ecosystems		*Altered habitat potential, with species at their environmental margins most affected.*
Water-based recreation		*Impacts through changes in river flows and water quality.*

1.6.1.3 Adaptation to Climate Change

The UK Climate Change Risk Assessment (CCRA) 2017 Evidence Report[52] draws together and interprets the evidence gathered by CCRA regarding current and future threats and opportunities for the UK posed by the impacts of climate change up until 2100. Overall, the findings of the CCRA indicate that the greatest need for early adaptation action (i.e. within the next 5 years) is in the following areas:

- Flood and coastal erosion risk management
- Specific aspects of natural ecosystems, including managing productivity and biodiversity (the management of forest pests and diseases, low summer river flows and the movement of plants and animal species are all highlighted as high priorities for action)
- Managing water resources, particularly in areas with increasing water scarcity
- Overheating of buildings and infrastructure in the urban environment
- Health risks associated with heatwaves and other risks that may affect the NHS
- Opportunities for the UK economy, particularly to develop climate adaptation products and services.

[51] DECC (2020) Local authority carbon dioxide emissions estimates 2018, Statistical Release
[52] Defra (2016) The UK Climate Change Risk Assessment 2017 Evidence Report

1.6.2 Future Baseline

Government and international targets indicate significant cuts in greenhouse gas emissions will take place by 2027. The UK met the first and second carbon budgets with headrooms of 36 and 384 MtCO2e respectively and is currently projected to meet the third carbon budget with a headroom of around 26 MtCO2e (until 2022)[53]. Objectives are being achieved for many air pollutants (lead, benzene, 1,3-butadiene and carbon monoxide (CO)). However, measurements show that long-term reducing trends for NO_2[54] and PM10[55] are flattening or even reversing at a number of locations, despite current policy measures.

For example, emissions of PM10 and PM2.5 have been relatively stable since 2009. The Government's aim is to reduce emissions of PM2.5 against the 2005 baseline by 30% by 2020, and 46% by 2030, emissions of NO_2 against the 2005 baseline by 55% by 2020 and 73% by 2020 and to reduce emissions of sulphur dioxide against the 2005 baseline by 59% by 2020, increasing to 88% by 2030. Projections suggest with a high degree of certainty that objectives for PM10, NO_2 and O3[56] will not be achieved by 2020[57].

The CCRA considered more than 700 risks and selected 100 risks for detailed review. A selection of threats and opportunities identified under the 'medium scenario' are summarised in **Figure D.8**.

As well as reducing the carbon footprint, Yorkshire Water are investing in flood resilience measures such as building flood protection walls around treatment works and raising control panels for electrical equipment above flood levels. They are working in partnership with the government to make sure that critical national infrastructure is able to cope with future weather events. This includes working with local authorities, emergency services and others to test and improve joint emergency response plans.

Together with leading academics and experts, Yorkshire Water is also working on research studies and innovative solutions like Sustainable Urban Drainage Systems (SUDs) and real time models of our river networks. These projects will help the company understand and manage the water cycle better so that it can maintain high levels of customer service in a way that is cost effective and which delivers multiple benefits for people, wildlife and the environment.

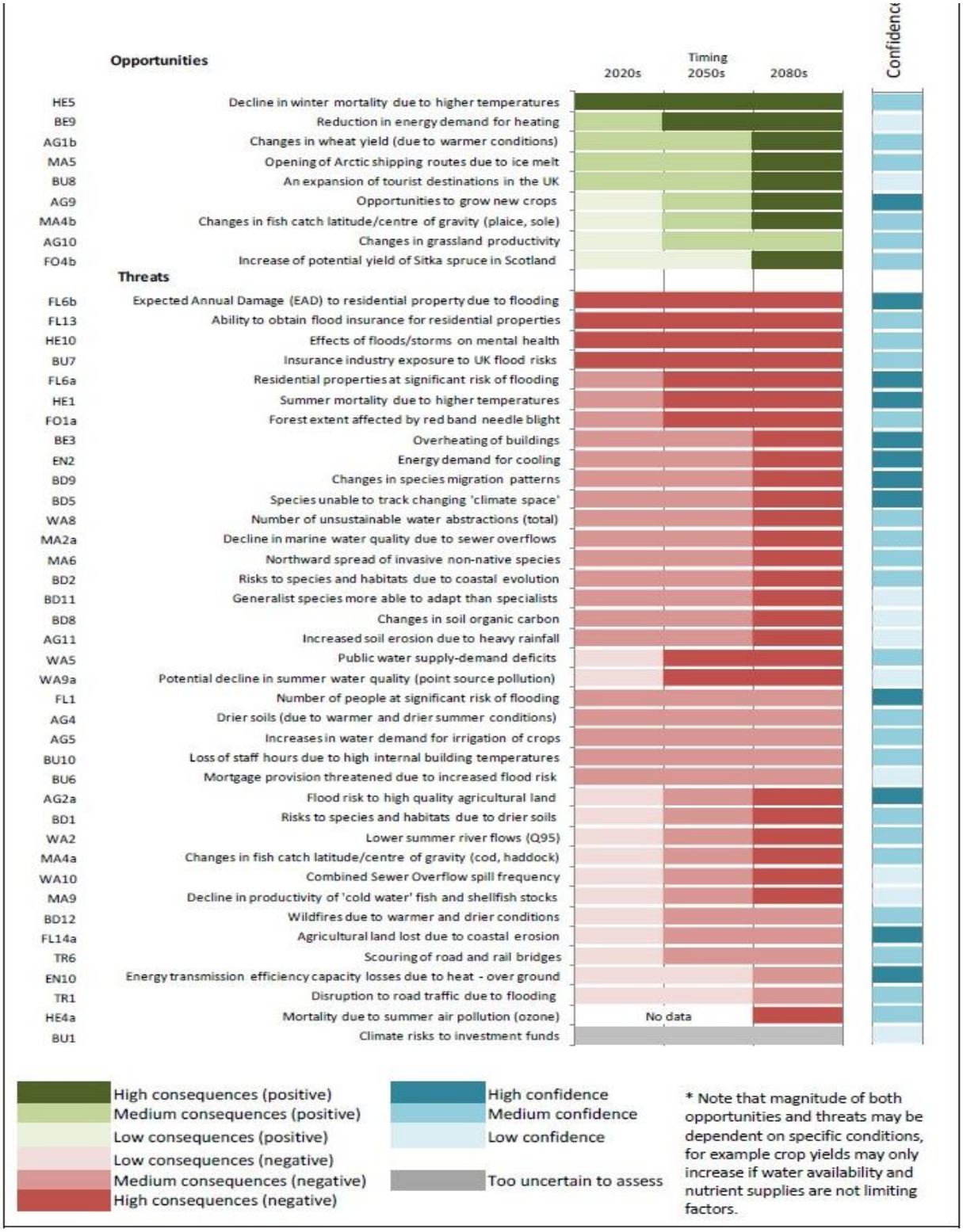
1.6.3 Key Issues

The key sustainability issue arising from the baseline assessment for air and climate is:

- The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.
- The need to mitigate against climate change through the reduction in greenhouse gas emissions in order to contribute to risk reduction over the long term.
- The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities of climate change.

[53] DECC (2020) Updated energy and emissions projections 2019 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501292/eepReport2015_160205.pdf
[54] Nitrogen dioxide
[55] Particulates with a diameter of 10µm or less
[56] Ozone
[57] Defra (2019), Clean Air Strategy 2019

Figure D.8 Summary of natural environment impacts with an indication of direction, magnitude and confidence (CCRA, 2012)



1.7 Archaeology and Cultural Heritage

1.7.1 Baseline

The Yorkshire Water supply area and Tyne-Tees corridor includes three internationally recognised World Heritage Sites[58]: Saltaire; Sudley Royal Park including the ruins of Fountains Abbey; the Frontiers of the Roman Empire (Hadrian's Wall).

There are approximately 2,671 Scheduled Monuments (SMs) located within Yorkshire Water supply area and 178 within 5 km of impacted reaches of the Tyne-Tees corridor.

Options in the WRMP could affect historic landscape character and historic structures associated with the water environment, or the historical context of their setting. Archaeological remains are also sensitive to changes in water quality, water levels (for example waterlogged deposits), pollution and land use practices.

Registered Parks and Gardens also make up part of the UK's cultural heritage of national importance. There are approximately 131 sites designated as such in the WRZs. Nationally important archaeological sites are statutorily protected as designated heritage assets. **Table D.13** shows the designated heritage asset count nationally, regionally and within the Yorkshire Water supply area (and the Tees Swale Transfer area). World Heritage Sites, Registered Historic Battlefields and Registered Parks and Gardens are shown in **Figure D.9**.

Table D.13 Designated Heritage Assets

Asset	England	Yorkshire and Humber	North East	Yorkshire Water Supply Area*	*Tees Swale Transfer corridor*
World Heritage Site	18	3	2	3	*1*
Scheduled Monuments	19,749	2,624	1,378	2,934	*178*
Conservation Areas	9,800	861	297	unknown	*unknown*
Listed Buildings	375,121	31,417	12,252	30,809	*3,301*
Registered Parks and Gardens	1,610	117	53	131	*11*
Registered Historic Battlefields	43	7	6	7	*0*
Protected Historic Wrecks	*46*	*1*	*1*	*1*	*0*

*Source: Historic England: Heritage counts 2021 (*designated assets were identified from GIS datasets available from Historic England at http://services.english-heritage.org.uk/NMRDataDownload/)*

Historic England has been collecting data on buildings at risk for more than a decade. The National Heritage at Risk Register systematically checks the condition of problem buildings, initially focused on buildings at risk, but now adapted to serve other types of heritage asset. The number of grade I and II* buildings at risk fell by 17% between 1999 and 2007. However, there has been a significant slow-down in the annual rate of decrease since then[59]. For other types of heritage assets, the long-term trends are not yet firmly established but a very small reduction in the number of sites on the Register between 2009 and 2010 has been reported. Nationally, 1.71% of Scheduled Monuments are at risk of from water abstraction or dewatering. However, other assets such as those composed of organic material and preserved in waterlogged or anaerobic conditions are proportionately more at risk (e.g. palaeo-environmental deposits).

There are a number of floodplains within the Yorkshire Water supply area which are either known or suspected to be of high importance for waterlogged archaeology. Such evidence includes both material

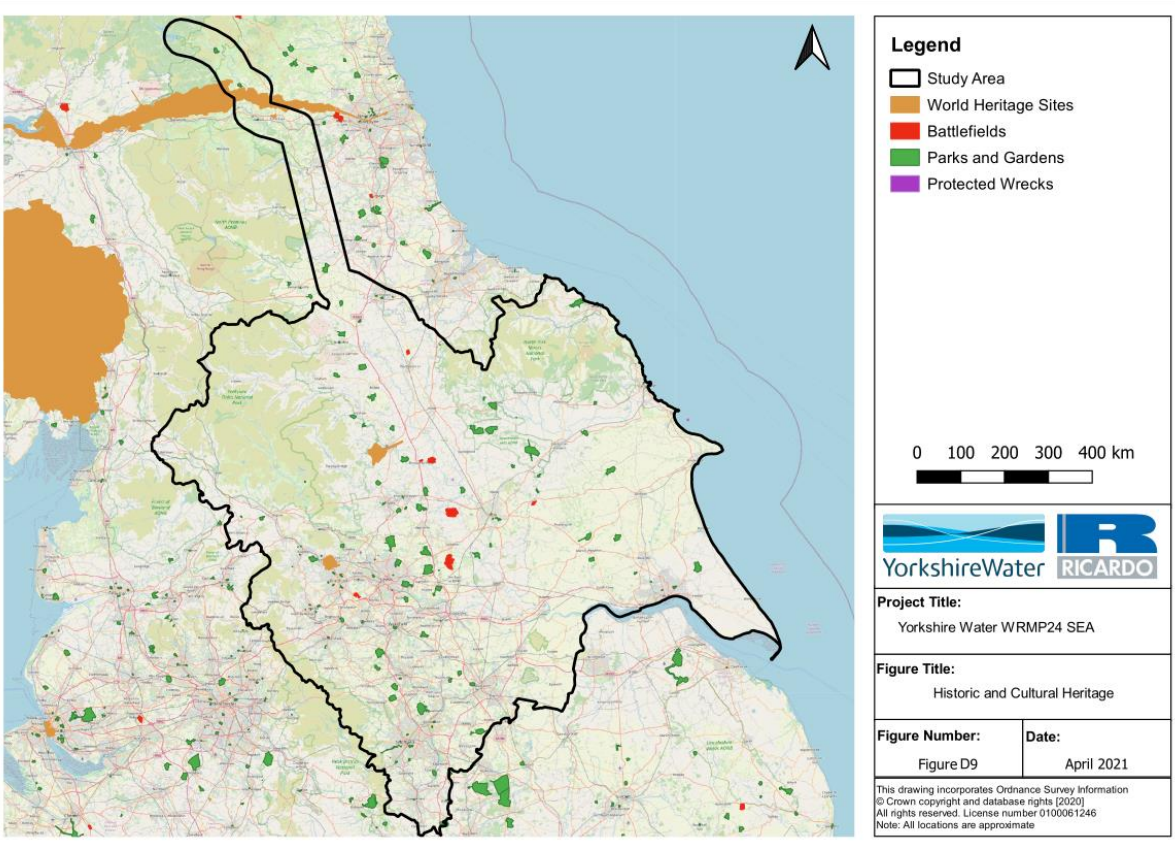
[58] World Heritage Sites are places of international importance for the conservation of mankind's cultural and natural heritage. The World Heritage List was set up by the World Heritage Convention, established by UNESCO in 1972. www.english-heritage.org.uk

[59] Heritage at Risk Register- North East and Yorkshire (2020) Historic England https://historicengland.org.uk/images-books/publications/har-2020-registers/ne-yo-har-register2020/

(wooden artefacts and structures such as trackways) and evidence of past environmental change from the deposits themselves.

The waterlogged conditions that preserve these remains may be rain-fed or groundwater fed. If the latter, then clearly abstraction levels can be a critical factor in maintaining conditions in which preservation of the remains is viable. In addition, there are waterlogged deposits that are specifically associated with chalk, such as springs and their intimately associated wetlands which again can contain important archaeological information, especially palaeo-environmental evidence.

Figure D.9 Historic and Cultural Heritage



1.7.2 Future Baseline

Core planning principles in the NPPF include those aiming to protect heritage assets, including "conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations"[60]. Recent and ongoing national economic difficulties may have a negative effect on removing heritage assets from the heritage at risk register. Climate change could have variable impacts on heritage assets in the future. Some types of assets and landscapes have already experienced and survived significant climatic changes in the past and may demonstrate considerable resilience in the face of future climate change. However, many more historic assets are potentially at risk from the direct impacts of future climate change[61].

1.7.3 Key Issues

The key sustainability issue arising from the baseline assessment for archaeology and cultural heritage is:

- The need to conserve or enhance sites of archaeological importance and cultural heritage interest, particularly those which are sensitive to the water environment.

[60] CLG (2012) National Planning Policy Framework, Communities and Local Government. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf
[61] English Heritage, now known as Historic England, (2010) Climate Change and the Historic Environment

1.8 Landscape and Visual Amenity

1.8.1 Baseline

The landscape character network[62] defines landscape character as 'a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse'. Some landscapes are special because they have a particular amenity value, such as those designated as Areas of Outstanding Natural Beauty (AONB). Others may have an intrinsic value as good examples or be the only remaining examples of a particular landscape type. Some landscapes are more sensitive to development whereas others have a greater capacity to accommodate development. Assessments of landscape character and landscape sensitivity enable decisions to be made about the most suitable location of development to minimise impacts on landscapes.

1.8.1.1 Nationally Designated Sites

There are three National Parks in the Yorkshire Water area which are protected by national legislation and water companies also have a statutory duty to have regard to the protection and conservation of national parks in carrying out their functions as a water undertaker. These parks are the Peak District, Yorkshire Dales and North York Moors.

AONBs are defined as ‘precious landscapes whose distinctive character and natural beauty are so outstanding that it is in the nation's interest to safeguard them’[63]. They are designated under the National Parks and Access to the Countryside Act, 1949, strengthened by the Countryside and Rights of Way Act, 2000. The primary purpose of the AONB is ‘to conserve and enhance the natural beauty of the landscape’. As outlined in **Table D.14**, there are three AONB within the Yorkshire Water supply area (Howardian Hills, Nidderdale and Forest of Bowland) and a further AONB within a 5 km corridor of the Tees Swale Transfer option (The North Pennines AONB). The North Pennines AONB has been awarded the UNESCO-backed status of 'European Geopark' (the first in Britain) in recognition of the area's world class earth heritage and the efforts being made to conserve and interpret it. Each of these AONBs has a Management Plan describing the special qualities of the area which contribute to the national significance of the landscape, identifies major trends and opportunities in the area and presents a 5-year programme of actions.

Figure D.10 shows the Landscape Designations across the SEA study area.

[62] www.landscapecharacter.org.uk, accessed 22nd March 2021
[63] Accessed at www.landscapecharacter.org.uk, accessed 22nd March 2021

Figure D.10 Landscape Designations

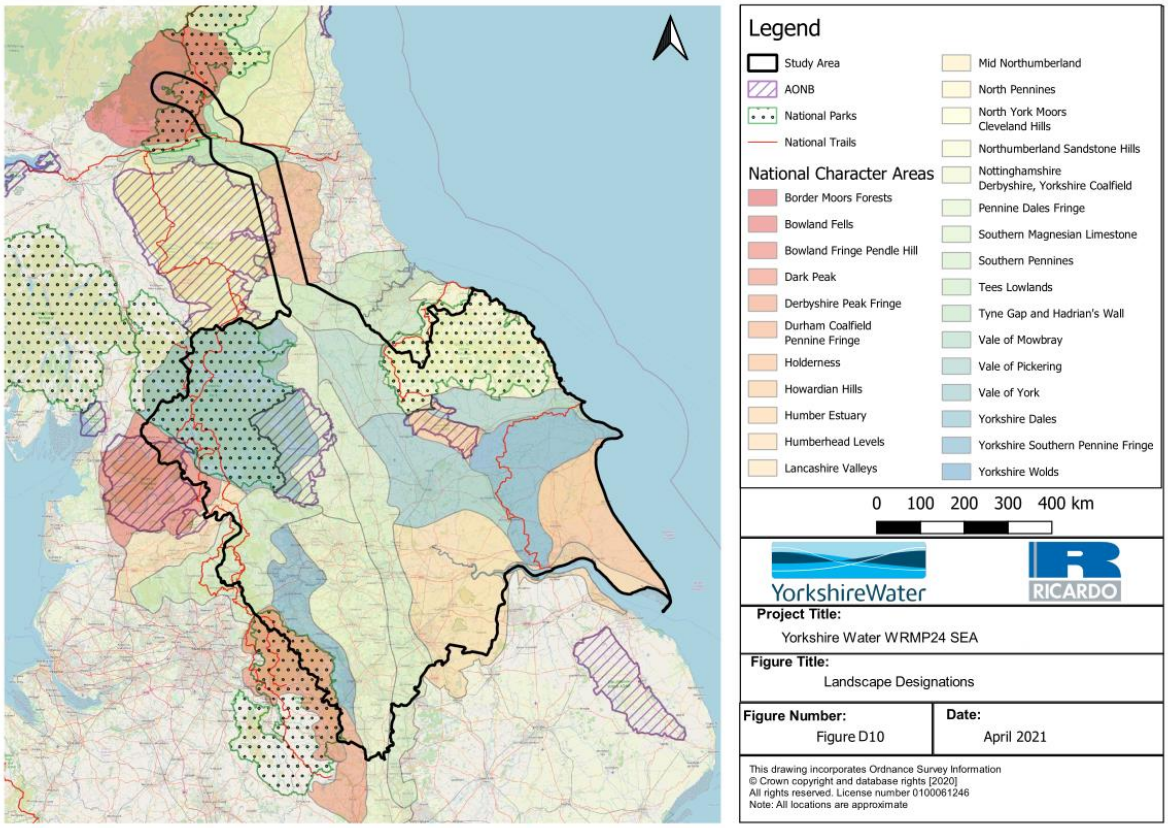


Table D.14 AONBs within the Yorkshire Water Supply Area

Site	WRZ	*Key Characteristics*
Howardian Hills	Grid SW; East GW	*Jurassic limestone creating distinctive character. In effect, the irregular 180m ridges of the Howardian Hills are a southern extension of the rocks of the North York Moors. Notably famous for a number of fine country houses, whose parklands are an intrinsic part of the landscape value*
Nidderdale	Grid SW	*Includes the wooded dales of the Washburn, Laver, Burn and dale of Nidd itself. Landscape is dominated by its millstone grit geology. Glaciation and differential resistance to weathering of the sand, shale and gritstones produce distinctive features.*
The North Pennines	Tees-Swale corridor	*Landscape contains many habitats of exceptional conservation value, including blanket bog, upland heath, species-rich hay meadows, oak and ash woodlands, juniper scrub, flushes and springs and unimproved and heavy- metal rich grasslands. It contains flowering plants on the calcareous grasslands of Teesdale which are unique in the UK. Internationally important numbers of birds, including 10,000 pairs of breeding waders and 80% of England's black grouse, breed and feed on the open moors and adjacent grasslands. The AONB includes parts of the Pennine Dales Environmentally Sensitive Area*
Forest of Bowland	*Grid SW*	*Internationally important landscape of heather moorland and blanket bog; Area host to rare bird species and important grouse/sheep populations; Majority of land is privately owned and used for agricultural purposes.*

The WRMP has the potential to influence the landscape and visual amenity through the change in water levels of rivers and reservoirs (either positively or negatively).

1.8.2 Future Baseline

The NPPF highlights the different roles and character of different areas, promoting the vitality of our main urban areas, protecting the Green Belts around them, recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it. The NPPF states that great weight should be given to conserving landscape and scenic beauty in National Parks and AONBs, which have the highest status of protection. It identifies that planning permission should be refused for major developments in these designated areas except in exceptional circumstances and where it can be demonstrated they are in the public interest.

1.8.3 Key Issues

The key sustainability issue arising from the baseline assessment for landscape and visual amenity is:

- The need to protect and improve the natural beauty of the region's National Parks, AONBs, and other areas of natural beauty.
- It is envisaged that landscape and designated sites will be maintained and enhanced for the enjoyment of the public.

1.9 Inter-relationships

It is noted that there are inter-relationships between SEA topics. Inter-relationships that result in changes to individual effects are considered through the assessment of synergistic effects.

Appendix E - Option assessment matrices

Scheme name	**C1a - Domestic customer audits and retrofit**
Scheme description	The scheme involves a trained plumber / technician visiting household properties to deliver a water audit and fit appropriate water efficient devices, such as low flush cistern devices, shower heads, tap aerators and mixer taps. The scheme requires recruitment of homeowners who agree to the installation of the devices. Recruitment can be achieved by using mail shots, telephone calls and website / social media advertising and will target properties thought to benefit most e.g. high users and low incomes. The scheme will aim to achieve savings of 0.02Ml/d over a five year period through home audit and retrofit. Data derived from Yorkshire Water's 2007 trial showed this type of scheme can achieve savings of 18 litres per property on average. One phase of five years, delivering audits and retrofit to 5,000 households to achieve a 0.02Ml/d reduction in demand. The phase will be delivered in a single AMP.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial)	Low (beneficial)	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Medium	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.02Ml/d benefit over five years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage of the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.02Ml/d benefit over five years. This in turn will also help to reduce overall water demand for the region. This scheme would not work to reduce leakage within the water supply system.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a small beneficial effect on water quality by reducing abstraction and discharge to the water environment, hence maintaining or increasing the quality of the waterbody. The overall benefit is likely to be negligible.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.02Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will provide a 0.02Ml/d benefit over five years. The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme will provide a 0.02Ml/d benefit over five years.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	C1b - Domestic customer audits and retrofit
Scheme description	The scheme involves a trained plumber / technician visiting household properties to deliver a water audit and fit appropriate water efficient devices, such as low flush cistern devices, shower heads, tap aerators and mixer taps. The scheme requires recruitment of homeowners who agree to the installation of the devices. Recruitment can be achieved by using mail shots, telephone calls and website / social media advertising and will target properties thought to benefit most e.g. high users and low incomes. The scheme will aim to achieve savings of 0.04Ml/d over a ten year period through home audit and retrofit. Data derived from Yorkshire Water's 2007 trial showed this type of scheme can achieve savings of 18 litres per property on average. One phase of ten years, delivering audits and retrofit to 10,000 households to achieve a 0.04Ml/d reduction in demand. The phase will be delivered in a single AMP.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial)	Low (beneficial)	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Medium	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.04Ml/d benefit over ten years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage of the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.04Ml/d benefit over ten years. This in turn will also help to reduce overall water demand for the region. This scheme would not work to reduce leakage within the water supply system.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a small beneficial effect on water quality by reducing abstraction and discharge to the water environment, hence maintaining or increasing the quality of the waterbody. The overall benefit is likely to be negligible.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.04Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will provide a 0.04Ml/d benefit over ten years. The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme will provide a 0.04Ml/d benefit over ten years.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C1c - Domestic customer audits and retrofit**
Scheme description	The scheme involves a trained plumber / technician visiting household properties to deliver a water audit and fit appropriate water efficient devices, such as low flush cistern devices, shower heads, tap aerators and mixer taps. The scheme requires recruitment of homeowners who agree to the installation of the devices. Recruitment can be achieved by using mail shots, telephone calls and website / social media advertising and will target properties thought to benefit most e.g. high users and low incomes. The scheme will aim to achieve savings of 0.06Ml/d over a fifteen year period through home audit and retrofit. Data derived from Yorkshire Water's 2007 trial showed this type of scheme can achieve savings of 18 litres per property on average. One phase of fifteen years, delivering audits and retrofit to 15,000 households to achieve a 0.06Ml/d reduction in demand. The phase will be delivered in a single AMP.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial)	Low (beneficial)	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Medium	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.06Ml/d benefit over fifteen years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage of the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.06Ml/d benefit over fifteen years. This in turn will also help to reduce overall water demand for the region. This scheme would not work to reduce leakage within the water supply system.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a small beneficial effect on water quality by reducing abstraction and discharge to the water environment, hence maintaining or increasing the quality of the waterbody. The overall benefit is likely to be negligible.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.06Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will provide a 0.06Ml/d benefit over fifteen years. The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme will provide a 0.06Ml/d benefit over fifteen years.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	C1d - Domestic customer audits and retrofit
Scheme description	The scheme involves a trained plumber / technician visiting household properties to deliver a water audit and fit appropriate water efficient devices, such as low flush cistern devices, shower heads, tap aerators and mixer taps. The scheme requires recruitment of homeowners who agree to the installation of the devices. Recruitment can be achieved by using mail shots, telephone calls and website / social media advertising and will target properties thought to benefit most e.g. high users and low incomes. The scheme will aim to achieve savings of 0.08Ml/d over a twenty year period through home audit and retrofit. Data derived from Yorkshire Water's 2007 trial showed this type of scheme can achieve savings of 18 litres per property on average. One phase of twenty years, delivering audits and retrofit to 20,000 households to achieve a 0.08Ml/d reduction in demand. The phase will be delivered in a single AMP.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial)	Low (beneficial)	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Medium	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.08Ml/d benefit over twenty years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage of the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.08Ml/d benefit over twenty years. This in turn will also help to reduce overall water demand for the region. This scheme would not work to reduce leakage within the water supply system.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a small beneficial effect on water quality by reducing abstraction and discharge to the water environment, hence maintaining or increasing the quality of the waterbody. The overall benefit is likely to be negligible.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.08Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will provide a 0.08Ml/d benefit over twenty years. The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme will provide a 0.08Ml/d benefit over twenty years.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C1e - Domestic customer audits and retrofit**
Scheme description	The scheme involves a trained plumber / technician visiting household properties to deliver a water audit and fit appropriate water efficient devices, such as low flush cistern devices, shower heads, tap aerators and mixer taps. The scheme requires recruitment of homeowners who agree to the installation of the devices. Recruitment can be achieved by using mail shots, telephone calls and website / social media advertising and will target properties thought to benefit most e.g. high users and low incomes. The scheme will aim to achieve savings of 0.1Ml/d over a twenty-five year period through home audit and retrofit. Data derived from Yorkshire Water's 2007 trial showed this type of scheme can achieve savings of 18 litres per property on average. One phase of twenty-five years, delivering audits and retrofit to 25,000 households to achieve a 0.1Ml/d reduction in demand. The phase will be delivered in a single AMP.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial)	Low (beneficial)	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Medium	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.1Ml/d benefit over twenty-five years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage of the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.1Ml/d benefit over twenty years. This in turn will also help to reduce overall water demand for the region. This scheme would not work to reduce leakage within the water supply system.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a small beneficial effect on water quality by reducing abstraction and discharge to the water environment, hence maintaining or increasing the quality of the waterbody. The overall benefit is likely to be negligible.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.1Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will provide a 0.1Ml/d benefit over twenty-five years. The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme will provide a 0.1Ml/d benefit over twenty years.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	C2 - Metering (domestic meter optants)									
Scheme description	This scheme proposes to increase the number of rateable value billed customers switching to a metered supply (domestic meter optants) by an additional 14,000-29,000 above those planned for in the baseline forecast. The total demand reduction over the plan lifetime to 2050 is 0.123-0.245Ml/d.									
SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The scheme will not have any direct impact upon biodiversity or ecology as the meters will be fitted internally to properties or in chambers within paved areas. There may be a small beneficial, longer term indirect effects upon biodiversity and ecology as a result of the reduced abstraction of water (or reduced need for additional abstraction. No impacts on designated sites are likely and the scheme may be beneficial by reducing the amount of water required to be abstracted.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	It is likely that there will be a small beneficial effect on fresh water provisions as a result of reduced demand. It is estimated consumption reduces by 5% on opting to a meter. Therefore, dependant on the alternative, the total demand reduction is 0.123-0.245Ml/d.	Small	Low	Long-term	Permanent	Low	Low	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Small	High	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help to promote more efficient use of water by households by offering meters. Consumption is estimated to reduce by 5% on opting to a meter, and the total demand reduction is estimated to be 0.123-0.245Ml/d. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Low	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation and the water environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water through the installation of water meters in household properties. The overall saving is forecast to be 0.123-0.245Ml/d. This will help reduce the overall water demand for the region with minor beneficial effects on materials and resource use. The proposed scheme would not reduce leakage from the water supply system.	Low	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme will have a negligible benefit on water quality in the region as the volumes of water saved are negligible on the scale of the region.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.123-0.245Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management, taking climate change into account.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The primary aim of the scheme is to encourage sustainable and efficient use of water resources. The overall water saving is expected to be 0.123-0.245Ml/d and the further expansion of metering will in turn support increased attention on water efficiency.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a minor, localised, temporary impact on air quality through the increased number of vehicle journeys made to fit meters and conduct subsequent meter reading activities.	Low	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will cause a minor, temporary increase in GHG emissions as a result of increased number of vehicle journeys made to survey premises, fit meters and conduct subsequent meter reading activities.	Low	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme aims to reduce consumption. The total demand reduction is 0.123-0.245Ml/d dependent upon the alternative that is chosen.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C4 - Metering on change of occupancy**
Scheme description	Change of occupancy metering provides another opportunity for household water savings. Install a meter when properties are sold and new occupier moves in a continous programme over 25 years. Number of installs reduces each AMP as more properties become metered. Metering on change of occupancy would deliver a total resource value of 5.7Ml/d over the plan lifetime to 2050.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The scheme will not have any direct impact upon biodiversity or ecology as the meters will be fitted internally to properties or in chambers within paved areas. There may be a minor beneficial, longer term indirect effects upon biodiversity and ecology as a result of the reduced abstraction of water (or reduced need for additional abstraction).	Medium	Low	Long- term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may result in a beneficial effect upon fresh water provisions as a result of reduced abstractions due to an increase in water efficiency (5.7Ml/d total).	Medium	Low	Long - Term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Small	High	Short - term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help to promote more efficient use of water by households as changes in occupancy occur. The total water saved is 5.7Ml/d. There will be very little if any areas affected by construction as meters will be fitted within households. There will a small number of vehicle movements to and from properties to fit meters and take subsequent readings. Adverse impacts upon population and human health will be negligible.	Medium	Low	Long - term	Permanent	Medium (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water through the installation of water meters leading to an overall forecast saving in demand of 23.69Ml/d. This will help reduce the overall water demand for the region, with minor beneficial effects on materials and resource use.	Medium	Low	Long - Term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a minor beneficial effect on water quality in the region by reducing abstraction of water thereby increasing low flows in watercourses, improving the dilution of any pollutants present.	Medium	Low	Long - Term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme will have a minor beneficial effect by reducing the demand for water which in turn will result in a reduction in abstraction volumes.	Medium	Low	Long - term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The scheme will have no impact on flood risk (beneficial or adverse) as the volumes of water saved are negligible in comparison to flood flows. Metering activities have no impact on flood plain storage.	N/A	Medium	N/A	N/A	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The primary aim of the scheme is to encourage sustainable and efficient use of water resources. The overall water saving is expected to be 23.69Ml/d and the further expansion of metering will in turn support increased attention on water efficiency and result in reduced per capita consumption.	Medium	Low	Long- term	Permanent	Medium (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Moderate beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small temporary impact on air quality through the increased number of vehicle journeys made to fit meters at properties and conduct subsequent meter reading activities.	Medium	Low	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a minor adverse impact on GHG emissions through the increased number of vehicle journeys made to fit water meters at properties on change of ownership and subsequent meter reading activities.	Medium	Low	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will make a moderate improvement to resilience to climate change by reducing water demand and consumption to contribute to a more resilient water supply system.	Medium	Low	Long -term	Permanent	Medium (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	C5 - Smart Metering
Scheme description	This option is to deliver a meter replacement programme to remove the existing AMR (automatic meter reading) meters from domestic customers' properties and installing smart meters. Smart metering will provide visibility of actual water use to customers and it is assumed that this will encourage customers to become more water efficient. The scheme would include new build housing, metered optants and retrofiting existing meters. Smart metering is assumed to deliver an average annual yield of 18Ml/d and a total resource value of 28Ml/d over the plan lifetime to 2050.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The scheme will not have any direct impact upon biodiversity or ecology as the smart meters will be fitted internally to properties or in chambers within paved areas. There may be a minor beneficial, longer term indirect effects upon biodiversity and ecology as a result of the reduced abstraction of water (or reduced need for additional abstraction. No impacts on designated sites are likely and the scheme may be beneficial by reducing the amount of water required to be abstracted.	Medium	Low	Long - Term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	It is likely that there will be a minor beneficial effect on fresh water provisions as a result of reduced demand. It is unlikely there will be any effect upon recreation, tourism or aesthetic value.	Medium	Low	Long - Term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Small	High	Short - term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help to promote more efficient use of water by households by offering smart meters, providing a resource value of 28Ml/d over a the plan lifetime to 2050. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible. There may be some temporary adverse effects as a result of increased vehicle movements required to fit the smart meters.	Medium	Low	Long - Term	Permanent	Medium (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help to promote more efficient use of water by households by offering smart meters. This will help reduce the overall water demand for the region by up to 28Ml/d over a the plan lifetime to 2050, with minor beneficial effects on materials and resource use.	Medium	Low	Long - Term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a minor beneficial effect on water quality by reducing abstraction and discharge to the environment, hence maintaining or increasing the quality of the waterbody.	Medium	Low	Long - Term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme will have a minor beneficial effect by reducing the demand for water which in turn will result in a reduction in abstraction volumes.	Medium	Low	Long - Term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Medium	High	Long - Term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The overall water saving is expected to be 28Ml/d over the plan lifetime. The primary aim of the scheme is to encourage more sustainable and efficient use of water resources, making the link between water efficiency and environmental protection, and result in reduced per capita consumption	Medium	Low	Long - Term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Moderate beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air quality through the increased number of vehicle journeys made to fit smart meters at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will cause a small, temporary increase in GHG emissions as a result of increased number of vehicle journeys made to fit smart meters at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable (28Ml/d saving) hence adapting to the threats of climate change.	Medium	Low	Long - Term	Permanent	Medium (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C6a - Commercial water user audits and retrofit**
Scheme description	Non-household water efficiency savings will be achieved through delivering audits and installing appropriate water saving retrofit devices in individual commercial properties. It is likely that 50-60% of the properties visited will benefit from the available devices. To save 0.2Ml/d, YW will need to install devices in approximately 616 properties. Meter readings collected during the audit and installation, plus regular post-installation meter readings, will enable YW to measure the savings made and recruit further properties if required. The option is included in five phases to allow flexibility. Each phase of option C6 (C6a, C6b, C6c, C6d and C6e) will aim to deliver a 0.2Ml/d saving over a five year period. Total resource value for C6a, as the first phase, is therefore 0.2Ml/d.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's commercial customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a minor beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at commercial sites is unlikely to spread INNS between sites.	Small	Low	Long- Term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by commercial businesses by offering water efficiency audits and retrofitting of water efficiency devices. This phase of the scheme will provide a 0.2Ml/d benefit over five years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by commercial businesses through the installation of new water saving devices. This in turn will also help to reduce the overall water demand for the region, and reduce leakage from the water supply system, with minor beneficial effects on materials and resource use.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a negligible beneficial effect on water quality in the region by reducing abstraction and discharges to the water environment, thus maintaining or increasing the quality of waterbodies.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Unlikely that there will be any adverse impacts upon surface or groundwater levels. The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.2Ml/d, thus providing a minor beneficial effect to both groundwater and surface flows.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection. Each phase of the scheme will provide a 0.2Ml/d benefit over five years, and result in reduced per capita consumption.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, temporary and localised impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will make a negligible improvement to resilience to climate change by reducing water demand and consumption to contribute to a more resilient water supply system.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C6b - Commercial water user audits and retrofit**
Scheme description	Non-household water efficiency savings will be achieved through delivering audits and installing appropriate water saving retrofit devices in individual commercial properties. It is likely that 50-60% of the properties visited will benefit from the available devices. To save 0.4Ml/d, YW will need to install devices in approximately 1231 properties. Meter readings collected during the audit and installation, plus regular post-installation meter readings, will enable YW to measure the savings made and recruit further properties if required. The option is included in five phases to allow flexibility. Each phase of option C6 (C6a, C6b, C6c, C6d and C6e) will aim to deliver a 0.2Ml/d saving over a five year period. Total resource value for C6b, as the second phase, is therefore 0.4Ml/d.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's commercial customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at commercial sites is unlikely to spread INNS between sites.	Small	Low	Long- Term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	C6	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by commercial businesses through the installation of new water saving devices. This in turn will also help to reduce the overall water demand for the region, and reduce leakage from the water supply system, with negligible beneficial effects on materials and resource use.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a negligible beneficial effect on water quality in the region by reducing abstraction and discharges to the water environment, thus maintaining or increasing the quality of waterbodies.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Unlikely that there will be any adverse impacts upon surface or groundwater levels. The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.4Ml/d, thus providing a negligible beneficial effect to both groundwater and surface flows.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection. Each phase of the scheme will provide a 0.4Ml/d benefit over ten years, and result in reduced per capita consumption.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, temporary and localised impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will make a negligible improvement to resilience to climate change by reducing water demand and consumption to contribute to a more resilient water supply system.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C6c - Commercial water user audits and retrofit**
Scheme description	Non-household water efficiency savings will be achieved through delivering audits and installing appropriate water saving retrofit devices in individual commercial properties. It is likely that 50-60% of the properties visited will benefit from the available devices. To save 0.6Ml/d, YW will need to install devices in approximately 1847 properties. Meter readings collected during the audit and installation, plus regular post-installation meter readings, will enable YW to measure the savings made and recruit further properties if required. The option is included in five phases to allow flexibility. Each phase of option C6 (C6a, C6b, C6c, C6d and C6e) will aim to deliver a 0.2Ml/d saving over a five year period. Total resource value for C6c, as the third phase, is therefore 0.6Ml/d.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's commercial customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at commercial sites is unlikely to spread INNS between sites.	Small	Low	Long- Term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by commercial businesses by offering water efficiency audits and retrofitting of water efficiency devices. This phase of the scheme will provide a 0.6Ml/d benefit over fifteen years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by commercial businesses through the installation of new water saving devices. This in turn will also help to reduce the overall water demand for the region, and reduce leakage from the water supply system, with negligible beneficial effects on materials and resource use.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a negligible beneficial effect on water quality in the region by reducing abstraction and discharges to the water environment, thus maintaining or increasing the quality of waterbodies.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Unlikely that there will be any adverse impacts upon surface or groundwater levels. The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.6Ml/d, thus providing a negligible beneficial effect to both groundwater and surface flows.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection. This phase of the scheme will provide a 0.6Ml/d benefit over fifteen years, and result in reduced per capita consumption.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, temporary and localised impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will make a negligible improvement to resilience to climate change by reducing water demand and consumption to contribute to a more resilient water supply system.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C6e - Commercial water user audits and retrofit**
Scheme description	Non-household water efficiency savings will be achieved through delivering audits and installing appropriate water saving retrofit devices in individual commercial properties. It is likely that 50-60% of the properties visited will benefit from the available devices. To save 0.8Ml/d, YW will need to install devices in approximately 2462 properties. Meter readings collected during the audit and installation, plus regular post-installation meter readings, will enable YW to measure the savings made and recruit further properties if required. The option is included in five phases to allow flexibility. Each phase of option C6 (C6a, C6b, C6c, C6d and C6e) will aim to deliver a 0.2Ml/d saving over a five year period. Total resource value for C6d, as the fourth phase, is therefore 0.8Ml/d.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's commercial customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at commercial sites is unlikely to spread INNS between sites.	Small	Low	Long- Term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by commercial businesses by offering water efficiency audits and retrofitting of water efficiency devices. This phase of the scheme will provide a 0.8Ml/d benefit over twenty years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by commercial businesses through the installation of new water saving devices. This in turn will also help to reduce the overall water demand for the region, and reduce leakage from the water supply system, with negligible beneficial effects on materials and resource use.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a negligible beneficial effect on water quality in the region by reducing abstraction and discharges to the water environment, thus maintaining or increasing the quality of waterbodies.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Unlikely that there will be any adverse impacts upon surface or groundwater levels. The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.8Ml/d, thus providing a negligible beneficial effect to both groundwater and surface flows.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection. This phase of the scheme will provide a 0.8Ml/d benefit over twenty years, and result in reduced per capita consumption.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, temporary and localised impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will make a negligible improvement to resilience to climate change by reducing water demand and consumption to contribute to a more resilient water supply system.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	C6e - Commercial water user audits and retrofit
Scheme description	Non-household water efficiency savings will be achieved through delivering audits and installing appropriate water saving retrofit devices in individual commercial properties. It is likely that 50-60% of the properties visited will benefit from the available devices. To save 1.0Ml/d, YW will need to install devices in approximately 3078 properties. Meter readings collected during the audit and installation, plus regular post-installation meter readings, will enable YW to measure the savings made and recruit further properties if required. The option is included in five phases to allow flexibility. Each phase of option C6 (C6a, C6b, C6c, C6d and C6e) will aim to deliver a 0.2Ml/d saving over a five year period. Total resource value for C6e, as the fifth phase, is therefore 1.0Ml/d.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's commercial customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at commercial sites is unlikely to spread INNS between sites.	Small	Low	Long- Term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by by commercial businesses by offering water efficiency audits and retrofitting of water efficiency devices. This phase of the scheme will provide a 1.0Ml/d benefit over twenty-five years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by commercial businesses through the installation of new water saving devices. This in turn will also help to reduce the overall water demand for the region, and reduce leakage from the water supply system, with negligible beneficial effects on materials and resource use.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a negligible beneficial effect on water quality in the region by reducing abstraction and discharges to the water environment, thus maintaining or increasing the quality of waterbodies.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Unlikely that there will be any adverse impacts upon surface or groundwater levels. The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 1.0Ml/d, thus providing a negligible beneficial effect to both groundwater and surface flows.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection. This phase of the scheme will provide a 1.0Ml/d benefit over twenty-five years, and result in reduced per capita consumption.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, temporary and localised impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will make a negligible improvement to resilience to climate change by reducing water demand and consumption to contribute to a more resilient water supply system.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C7a-e - Commercial water user audits and retrofit**									
Scheme description	This scheme is a variation on Option C6a-e and also includes five phases (C7a, C7b, C7c, C7d and C7e). As with C6, the scheme will deliver audits and retrofits to commercial properties in partnership with commercial retailers in our supply area. However, commercial water users will be asked to pay for the water efficiency devices installed. The option assumes audit and staffing costs to install will be funded by Yorkshire Water, although costs could be less if a retailer(s) was prepared to joint fund the scheme. Each phase of option C7 will aim to deliver a 1Ml/d saving over a five year period, for a total resource value of 5M/ld.									
SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's commercial customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a minor, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a minor beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at commercial sites is unlikely to spread INNS between sites.	Small	Low	Long- Term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water in commercial properties by offering water efficiency audits and retrofitting of water efficiency devices. Each phase of the scheme will provide a 1Ml/d benefit over five years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by commercial businesses through the installation of new water saving devices. This in turn will also help to reduce the overall water demand for the region, and reduce leakage from the water supply system by up to 1Ml/d per year, with minor beneficial effects on materials and resource use.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a negligible beneficial effect on water quality in the region by reducing abstraction and discharges to the water environment, thus maintaining or increasing the quality of waterbodies.	Small	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Unlikely that there will be any adverse impacts upon surface or groundwater levels. The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 1 Ml/d per phase, thus providing a minor beneficial effect to both groundwater and surface flows.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection. Each phase of the scheme will provide a 1Ml/d benefit over five years, and result in reduced per capita consumption.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, temporary and localised impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Medium (adverse)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will make a small improvement to resilience to climate change by reducing water demand and consumption to contribute to a more resilient water supply system.	Small	Low	long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C15a Household Flow Regulator - Internal**
Scheme description	This scheme will involve installing a pressure independent device at the inlet of a customers supply to their property. The device ensures the flow to a property is maintained at a fixed rate. This means if pressure changes such as at peak times when more water is put into the system the properties with this device maintain a constant pressure and water use is not increased. An average annual yield of 0.029Ml/d is anticipated. There are 5 variations of this scheme. C15a concerns the installation of 5000 devices per AMP. It is assumed that the replacement programme would start after 5 years but at 50% of properties to ensure the saving is maintained.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The scheme will not have any direct impact upon biodiversity or ecology as the devices will be fitted in the curtilage of properties or within paved areas. There may be a negligible beneficial, longer term indirect effects upon biodiversity and ecology as a result of the reduced abstraction of water (or reduced need for additional abstraction. No impacts on designated sites are likely and the scheme may be beneficial by reducing the amount of water required to be abstracted.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	It is likely that there will be a negligible beneficial effect on fresh water provisions as a result of reduced demand. It unlikely there will be any effect upon recreation, tourism or aesthetic value.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of pressure independent devices at properties is unlikely to spread INNS between sites.	Small	High	Short - term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help to create more efficient use of water by households by installing pressure independent devices, providing an average annual yield of 0.029Ml/d. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation (greenspace (ha)) and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help to create more efficient use of water by properties by installing pressure independent devices. The overall saving is forecast to be 0.029Ml/d per annum. This will help reduce the overall water demand for the region, with small beneficial effects on materials and resource use.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme will have a negligible benefit on water quality in the region as the volumes of water saved are very small.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme has a small but negligible effect on abstraction by reducing the water demand which in turn will result in a reduction in abstraction volumes.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water will have a negligible impact on flood risk management.	Medium	High	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will create more sustainable and efficient use of water resources, making the link between water efficiency and environmental protection, and result in reduced per capita consumption.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air quality through the increased number of vehicle journeys made to fit the devices at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will cause a small, temporary increase in GHG emissions as a result of increased number of vehicle journeys made to fit the devices at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in properties, making water resources more sustainable hence adapting to the threats of climate change. The demand reduction will be approximately 0.029Ml/d annually.	Medium	Low	Long - Term	Permanent	Medium (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C15b Household Flow Regulator - Internal**
Scheme description	This scheme will involve installing a pressure independent device at the inlet of a customers supply to their property. The device ensures the flow to a property is maintained at a fixed rate. This means if pressure changes such as at peak times when more water is put into the system the properties with this device maintain a constant pressure and water use is not increased. An average annual yield of 0.058Ml/d is anticipated. There are 5 variations of this scheme. C15b concerns the installation of 10000 devices per AMP. It is assumed that the replacement programme would start after 5 years but at 50% of properties to ensure the saving is maintained.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The scheme will not have any direct impact upon biodiversity or ecology as the devices will be fitted in the curtilage of properties or within paved areas. There may be a negligible beneficial, longer term indirect effects upon biodiversity and ecology as a result of the reduced abstraction of water (or reduced need for additional abstraction. No impacts on designated sites are likely and the scheme may be beneficial by reducing the amount of water required to be abstracted.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	It is likely that there will be a negligible beneficial effect on fresh water provisions as a result of reduced demand. It unlikely there will be any effect upon recreation, tourism or aesthetic value.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of pressure independent devices at properties is unlikely to spread INNS between sites.	Small	High	Short - term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help to create more efficient use of water by households by installing pressure independent devices, providing an average annual yield of 0.058Ml/d. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation (greenspace (ha)) and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help to create more efficient use of water by properties by installing pressure independent devices. The overall saving is forecast to be 0.058Ml/d per annum. This will help reduce the overall water demand for the region, with small beneficial effects on materials and resource use.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme will have a negligible benefit on water quality in the region as the volumes of water saved are very small.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme has a small but negligible effect on abstraction by reducing the water demand which in turn will result in a reduction in abstraction volumes.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water will have a negligible impact on flood risk management.	Medium	High	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will create more sustainable and efficient use of water resources, making the link between water efficiency and environmental protection, and result in reduced per capita consumption.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air quality through the increased number of vehicle journeys made to fit the devices at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will cause a small, temporary increase in GHG emissions as a result of increased number of vehicle journeys made to fit the devices at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in properties, making water resources more sustainable hence adapting to the threats of climate change. The demand reduction will be between 0.058Ml/d annually.	Medium	Low	Long - Term	Permanent	Medium (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C15c Household Flow Regulator - Internal**
Scheme description	This scheme will involve installing a pressure independent device at the inlet of a customers supply to their property. The device ensures the flow to a property is maintained at a fixed rate. This means if pressure changes such as at peak times when more water is put into the system the properties with this device maintain a constant pressure and water use is not increased. An average annual yield of 0.087Ml/d is anticipated. There are 5 variations of this scheme. C15c concerns the installation of 15000 devices per AMP. It is assumed that the replacement programme would start after 5 years but at 50% of properties to ensure the saving is maintained.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The scheme will not have any direct impact upon biodiversity or ecology as the devices will be fitted in the curtilage of properties or within paved areas. There may be a negligible beneficial, longer term indirect effects upon biodiversity and ecology as a result of the reduced abstraction of water (or reduced need for additional abstraction. No impacts on designated sites are likely and the scheme may be beneficial by reducing the amount of water required to be abstracted.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	It is likely that there will be a negligible beneficial effect on fresh water provisions as a result of reduced demand. It unlikely there will be any effect upon recreation, tourism or aesthetic value.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of pressure independent devices at properties is unlikely to spread INNS between sites.	Small	High	Short - term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help to create more efficient use of water by households by installing pressure independent devices, providing an average annual yield of 0.087Ml/d. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation (greenspace (ha)) and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help to create more efficient use of water by properties by installing pressure independent devices. The overall saving is forecast to be 0.087Ml/d per annum. This will help reduce the overall water demand for the region, with small beneficial effects on materials and resource use.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme will have a negligible benefit on water quality in the region as the volumes of water saved are very small.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme has a small but negligible effect on abstraction by reducing the water demand which in turn will result in a reduction in abstraction volumes.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water will have a negligible impact on flood risk management.	Medium	High	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will create more sustainable and efficient use of water resources, making the link between water efficiency and environmental protection, and result in reduced per capita consumption.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air quality through the increased number of vehicle journeys made to fit the devices at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will cause a small, temporary increase in GHG emissions as a result of increased number of vehicle journeys made to fit the devices at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in properties, making water resources more sustainable hence adapting to the threats of climate change. The demand reduction will be between 0.087Ml/d annually.	Medium	Low	Long - Term	Permanent	Medium (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C15d Household Flow Regulator - Internal**
Scheme description	This scheme will involve installing a pressure independent device at the inlet of a customers supply to their property. The device ensures the flow to a property is maintained at a fixed rate. This means if pressure changes such as at peak times when more water is put into the system the properties with this device maintain a constant pressure and water use is not increased. An average annual yield of 0.116Ml/d is anticipated. There are 5 variations of this scheme. C15d concerns the installation of 20000 devices per AMP. It is assumed that the replacement programme would start after 5 years but at 50% of properties to ensure the saving is maintained.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The scheme will not have any direct impact upon biodiversity or ecology as the devices will be fitted in the curtilage of properties or within paved areas. There may be a negligible beneficial, longer term indirect effects upon biodiversity and ecology as a result of the reduced abstraction of water (or reduced need for additional abstraction. No impacts on designated sites are likely and the scheme may be beneficial by reducing the amount of water required to be abstracted.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	It is likely that there will be a negligible beneficial effect on fresh water provisions as a result of reduced demand. It unlikely there will be any effect upon recreation, tourism or aesthetic value.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of pressure independent devices at properties is unlikely to spread INNS between sites.	Small	High	Short - term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help to create more efficient use of water by households by installing pressure independent devices, providing an average annual yield of 0.116Ml/d. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation (greenspace (ha)) and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help to create more efficient use of water by properties by installing pressure independent devices. The overall saving is forecast to be 0.116Ml/d per annum. This will help reduce the overall water demand for the region, with small beneficial effects on materials and resource use.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme will have a negligible benefit on water quality in the region as the volumes of water saved are very small.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme has a small but negligible effect on abstraction by reducing the water demand which in turn will result in a reduction in abstraction volumes.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water will have a negligible impact on flood risk management.	Medium	High	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will create more sustainable and efficient use of water resources, making the link between water efficiency and environmental protection, and result in reduced per capita consumption.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air quality through the increased number of vehicle journeys made to fit the devices at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will cause a small, temporary increase in GHG emissions as a result of increased number of vehicle journeys made to fit the devices at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in properties, making water resources more sustainable hence adapting to the threats of climate change. The demand reduction will be between 0.116Ml/d annually.	Medium	Low	Long - Term	Permanent	Medium (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C15e Household Flow Regulator - Internal**
Scheme description	This scheme will involve installing a pressure independent device at the inlet of a customers supply to their property. The device ensures the flow to a property is maintained at a fixed rate. This means if pressure changes such as at peak times when more water is put into the system the properties with this device maintain a constant pressure and water use is not increased. An average annual yield of 0.145Ml/d is anticipated. There are 5 variations of this scheme. C15e concerns the installation of 25000 devices per AMP. It is assumed that the replacement programme would start after 5 years but at 50% of properties to ensure the saving is maintained.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The scheme will not have any direct impact upon biodiversity or ecology as the devices will be fitted in the curtilage of properties or within paved areas. There may be a negligible beneficial, longer term indirect effects upon biodiversity and ecology as a result of the reduced abstraction of water (or reduced need for additional abstraction. No impacts on designated sites are likely and the scheme may be beneficial by reducing the amount of water required to be abstracted.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	It is likely that there will be a negligible beneficial effect on fresh water provisions as a result of reduced demand. It unlikely there will be any effect upon recreation, tourism or aesthetic value.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of pressure independent devices at properties is unlikely to spread INNS between sites.	Small	High	Short - term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help to create more efficient use of water by households by installing pressure independent devices, providing an average annual yield of 0.145Ml/d. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not affect access to recreation (greenspace (ha)) and the water environment and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help to create more efficient use of water by properties by installing pressure independent devices. The overall saving is forecast to be 0.145Ml/d per annum. This will help reduce the overall water demand for the region, with small beneficial effects on materials and resource use.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme will have a negligible benefit on water quality in the region as the volumes of water saved are very small.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme has a small but negligible effect on abstraction by reducing the water demand which in turn will result in a reduction in abstraction volumes.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water will have a negligible impact on flood risk management.	Medium	High	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will create more sustainable and efficient use of water resources, making the link between water efficiency and environmental protection, and result in reduced per capita consumption.	Medium	Low	Long - Term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air quality through the increased number of vehicle journeys made to fit the devices at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will cause a small, temporary increase in GHG emissions as a result of increased number of vehicle journeys made to fit the devices at properties.	Medium	Moderate	Short - term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in properties, making water resources more sustainable hence adapting to the threats of climate change. The demand reduction will be between 0.145Ml/d annually.	Medium	Low	Long - Term	Permanent	Medium (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C21a - Housing Associations - targeted programme**
Scheme description	The scheme involves a trained plumber / technician visiting targeted Housing Association properties to deliver a water audit and fit appropriate water efficient devices, such as low flush cistern devices, shower heads, tap aerators and mixer taps. The scheme requires recruitment of residents of Housing Association properties who volunteer to the installation of the devices in their homes. Recruitment can be achieved by using mail shots, telephone calls and website / social media advertising and will target properties thought to benefit most e.g. high users and low incomes. The scheme will aim to achieve savings of 0.0301Ml/d over a five year period through home audit and retrofit. Data derived from Yorkshire Water's 2007 trial showed this type of scheme can achieve savings of 18 litres per property on average. The scheme would be delivered over five phases. C21a represents the first phase of five years, delivering audits and retrofit to 10,000 households to achieve a 0.0301Ml/d reduction in demand. The phase will be delivered in a single AMP.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial)	Low (beneficial)	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Medium	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.0301Ml/d benefit over five years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage of the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.0301Ml/d benefit over five years. This in turn will also help to reduce overall water demand for the region. This scheme would not work to reduce leakage within the water supply system.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a small beneficial effect on water quality by reducing abstraction and discharge to the water environment, hence maintaining or increasing the quality of the waterbody. The overall benefit is likely to be negligible.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.0301Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will provide a 0.0301Ml/d benefit over five years. The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme will provide a 0.0301Ml/d benefit over five years.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C21b - Housing Associations - targeted programme**
Scheme description	The scheme involves a trained plumber / technician visiting targeted Housing Association properties to deliver a water audit and fit appropriate water efficient devices, such as low flush cistern devices, shower heads, tap aerators and mixer taps. The scheme requires recruitment of residents of Housing Association properties who volunteer to the installation of the devices in their homes. Recruitment can be achieved by using mail shots, telephone calls and website / social media advertising and will target properties thought to benefit most e.g. high users and low incomes. The scheme will aim to achieve savings of 0.07525Ml/d over a ten year period through home audit and retrofit. Data derived from Yorkshire Water's 2007 trial showed this type of scheme can achieve savings of 18 litres per property on average. The scheme would be delivered over five phases. C21b represents the second phase of five years, delivering audits and retrofit to 25,000 households to achieve a 0.07525Ml/d reduction in demand. The phase will be delivered in a single AMP.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial)	Low (beneficial)	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Medium	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.07525Ml/d benefit over ten years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage of the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.07525Ml/d benefit over ten years. This in turn will also help to reduce overall water demand for the region. This scheme would not work to reduce leakage within the water supply system.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a small beneficial effect on water quality by reducing abstraction and discharge to the water environment, hence maintaining or increasing the quality of the waterbody. The overall benefit is likely to be negligible.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.07525Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will provide a 0.07525Ml/d benefit over ten years. The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme will provide a 0.07525Ml/d benefit over ten years.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	C21c - Housing Associations - targeted programme
Scheme description	The scheme involves a trained plumber / technician visiting targeted Housing Association properties to deliver a water audit and fit appropriate water efficient devices, such as low flush cistern devices, shower heads, tap aerators and mixer taps. The scheme requires recruitment of residents of Housing Association properties who volunteer to the installation of the devices in their homes. Recruitment can be achieved by using mail shots, telephone calls and website / social media advertising and will target properties thought to benefit most e.g. high users and low incomes. The scheme will aim to achieve savings of 0.1505Ml/d over a fifteen year period through home audit and retrofit. Data derived from Yorkshire Water's 2007 trial showed this type of scheme can achieve savings of 18 litres per property on average. The scheme would be delivered over five phases. C21c represents the third phase of five years, delivering audits and retrofit to 50,000 households to achieve a 0.1505Ml/d reduction in demand. The phase will be delivered in a single AMP.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial)	Low (beneficial)	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Medium	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.1505Ml/d benefit over fifteen years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage of the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.1505Ml/d benefit over fifteen years. This in turn will also help to reduce overall water demand for the region. This scheme would not work to reduce leakage within the water supply system.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a small beneficial effect on water quality by reducing abstraction and discharge to the water environment, hence maintaining or increasing the quality of the waterbody. The overall benefit is likely to be negligible.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.1505Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will provide a 0.1505Ml/d benefit over fifteen years. The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme will provide a 0.01505Ml/d benefit over fifteen years.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**C21d - Housing Associations - targeted programme**
Scheme description	The scheme involves a trained plumber / technician visiting targeted Housing Association properties to deliver a water audit and fit appropriate water efficient devices, such as low flush cistern devices, shower heads, tap aerators and mixer taps. The scheme requires recruitment of residents of Housing Association properties who volunteer to the installation of the devices in their homes. Recruitment can be achieved by using mail shots, telephone calls and website / social media advertising and will target properties thought to benefit most e.g. high users and low incomes. The scheme will aim to achieve savings of 0.22575Ml/d over a twenty year period through home audit and retrofit. Data derived from Yorkshire Water's 2007 trial showed this type of scheme can achieve savings of 18 litres per property on average. The scheme would be delivered over five phases. C21d represents the fourth phase of five years, delivering audits and retrofit to 75,000 households to achieve a 0.22575Ml/d reduction in demand. The phase will be delivered in a single AMP.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial)	Low (beneficial)	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Medium	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.22575Ml/d benefit over twenty years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage of the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.22575Ml/d benefit over twenty years. This in turn will also help to reduce overall water demand for the region. This scheme would not work to reduce leakage within the water supply system.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a small beneficial effect on water quality by reducing abstraction and discharge to the water environment, hence maintaining or increasing the quality of the waterbody. The overall benefit is likely to be negligible.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.22575Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will provide a 0.22575Ml/d benefit over twenty years. The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme will provide a 0.022575Ml/d benefit over twenty years.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	C21e - Housing Associations - targeted programme
Scheme description	The scheme involves a trained plumber / technician visiting targeted Housing Association properties to deliver a water audit and fit appropriate water efficient devices, such as low flush cistern devices, shower heads, tap aerators and mixer taps. The scheme requires recruitment of residents of Housing Association properties who volunteer to the installation of the devices in their homes. Recruitment can be achieved by using mail shots, telephone calls and website / social media advertising and will target properties thought to benefit most e.g. high users and low incomes. The scheme will aim to achieve savings of 0.301Ml/d over a twenty-five year period through home audit and retrofit. Data derived from Yorkshire Water's 2007 trial showed this type of scheme can achieve savings of 18 litres per property on average. The scheme would be delivered over five phases. C21e represents the fifth phase of five years, delivering audits and retrofit to 100,000 households to achieve a 0.301Ml/d reduction in demand. The phase will be delivered in a single AMP.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	This scheme will aim to meet demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. It is very unlikely that the scheme will any direct impact upon biodiversity or ecology as the audits and devices fitted are all internal to properties. There may be a negligible, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a negligible beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (beneficial)	Low (beneficial)	None	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and fitting of water efficient devices at the household level is unlikely to spread INNS between sites.	Medium	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.301Ml/d benefit over twenty-five years. This in turn will also help to reduce overall water demand for the region. The scheme is unlikely to have any adverse impacts on population and human health. The impact on water bills will be negligible.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme will not improve access to recreation and the environment, and is not likely to have any adverse impacts on recreation, tourism and navigation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage of the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. This type of scheme can achieve savings of 18 litres per property on average, and the scheme will provide a 0.301Ml/d benefit over twenty-five years. This in turn will also help to reduce overall water demand for the region. This scheme would not work to reduce leakage within the water supply system.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme may have a small beneficial effect on water quality by reducing abstraction and discharge to the water environment, hence maintaining or increasing the quality of the waterbody. The overall benefit is likely to be negligible.	Medium	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme may lead to a slight reduction in abstraction of water, or reduce the scale of any increased abstraction across the Yorkshire Water region by up to 0.301Ml/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The small change in demand and discharge of water spread out over Yorkshire will have a negligible impact on flood risk management.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will provide a 0.301Ml/d benefit over twenty-five years. The primary aim of the scheme is to encourage more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection.	Medium	High	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	It is not expected that the scheme will have any direct impacts upon the local geology or land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	It is expected that the scheme will have a small, localised, temporary impact on air emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is expected that the scheme will have a small, temporary impact on GHG emissions through the increased number of vehicle journeys made to survey premises, fit water saving devices and the regular maintenance/replacement of the devices.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	This scheme aims to improve the efficiency of water use in homes, making water resources more sustainable hence adapting to the threats of climate change. The scheme will provide a 0.0301Ml/d benefit over twenty-five years.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The scheme is not expected to have any direct impacts upon the historic environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	None	None

Scheme name	**L1 Active leakage control 14Ml/d**
Scheme description	The option involves a combination of active leakage control (including new techniques such as acoustic logging and satellite technology), trunk main leakage detection, mains and service pipe relining/renewal, pressure management and smart metering technology. The option aims to drive down leakage to a reduced target and maintain at that level.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	Mains replacement and repair and acoustic logging will require excavation to access water pipes. Pressure management leakage control measures will also require very limited excavation activity to install pressure management valves. These activities will be temporary and concentrated in urban/suburban areas where impacts on designated sites or other sites of conservation importance are unlikely. Impacts of the work on local non-designated habitats are likely to be no greater than negligible. This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with small beneficial effects likely to arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a small beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage control.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and and repair of leakage, mains replacement/repaire is unlikely to spread INNS between sites.	Small	Medium	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Excavation work, transport of materials and traffic disruption may also give rise to temporary nuisance from noise, dust and vibration when sited close to areas of population density. Effects are unlikely to be any greater than negligible adverse given the scale of the activities required and with best practice construction methods applied. The scheme will help to ensure levels of service are maintained through enabling provision of water that would have otherwise been lost to leakage and increased supply system reinforcements (14Ml/d by the end of the scheme).	Medium	Moderate	Medium-term	Temporary	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Mains replacement and repair activities have the potential to disrupt some recreational activities (greenspace (ha)) temporarily on an intermittent basis. Dependent on the location of the works there may be temporary adverse effects on public rights of way, railways, roads and other transport or access routes. However, effects on the water environment are expected to be negligible.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	Increased leakage reduction will result in the reduction of water lost in the supply network and therefore the energy and chemicals used to treat it. The scheme will help to reduce the overall water demand for the region by 14Ml/d by the end of the scheme delivery period and result in a proportionate reduction of leakage from the water supply system, with small beneficial effects on materials and resource use. Resources for pipework renewal are relatively modest, but the scheme will require some use of materials at a scale consistent with the size of the scheme.	Medium	Moderate	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with small beneficial effects likely to arise for water quality within the zone of influence of Yorkshire Water's sources of supply.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with minor beneficial effects likely to arise for sustainable water resources and reducing the need for development of new water sources.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works could be located within or in proximity to Flood Risk Zones 2 and 3. As such temporary mitigation measures may be required to alleviate flood risk. However, there will be no permanent land-take within floodplains and no new above-ground infrastructure, so impacts are expected to be negligible.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.4 To increase awareness of water sustainability and efficient use of water.	This scheme will improve the efficiency of water use by reducing operational losses through leakage and helping to promote water efficiency to Yorkshire Water customers and result in reduced per capita consumption. The scale of water savings (14Ml/d by the end of the scheme delivery period) is assessed as providing a minor beneficial effect.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Accessing water pipes in order to replace or repair them, or to install loggers and meters, will require excavations to the level of the existing pipes concentrated in urban/suburban areas – this will be a small-scale impact on soils and have no greater than a negligible effect. The impacts of this on the soils in the local area will be mitigated by best practice construction methods, and the ground will be re-instated so there no long-term adverse effects are anticipated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	The scheme may result in temporary, intermittent and localised increases in air emissions and dust arising from vehicle movements associated with activities such as mains replacement and repair.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	The scheme may result in temporary intermittent increases in GHG emissions arising from vehicle movements associated with mains replacement and repair and installation of meters and loggers.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will help increase resilience to climate change as the overall loss of water from the system will be reduced (14Ml/d by the end of the scheme delivery period), reducing the water demand on the supply system.	Medium	Moderate	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The excavations and works associated with mains replacement or repair, or to install loggers and meters will take place in previously disturbed ground thus the potential for adverse impacts upon known and unknown buried historical assets and above ground heritage assets is negligible.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The excavations and works associated with mains replacement or repair, or to install loggers and meters have the potential for temporary, small adverse impact on both designated and undesignated landscapes and townscapes temporarily. Visual amenity will not be affected in the long term as once pipes are replaced or repaired they will be re-buried and the land re-instated.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	**L2 Active leakage control 30Ml/d**
Scheme description	The option involves a combination of active leakage control (including new techniques such as acoustic logging and satellite technology), trunk main leakage detection, mains and service pipe relining/renewal, pressure management and smart metering technology. The option aims to drive down leakage to a reduced target and maintain at that level.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	Mains replacement and repair and acoustic logging will require excavation to access water pipes. Pressure management leakage control measures will also require very limited excavation activity to install pressure management valves. These activities will be temporary and concentrated in urban/suburban areas where impacts on designated sites or other sites of conservation importance are unlikely. Impacts of the work on local non-designated habitats are likely to be no greater than negligible. This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with small beneficial effects likely to arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a small beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage control.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and and repair of leakage, mains replacement/repaire is unlikely to spread INNS between sites.	Small	Medium	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Excavation work, transport of materials and traffic disruption may also give rise to temporary nuisance from noise, dust and vibration when sited close to areas of population density. Effects are unlikely to be any greater than negligible adverse given the scale of the activities required and with best practice construction methods applied. The scheme will help to ensure levels of service are maintained through enabling provision of water that would have otherwise been lost to leakage and increased supply system reinforcements (30Ml/d by the end of the scheme).	Medium	Moderate	Medium-term	Temporary	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Mains replacement and repair activities have the potential to disrupt some recreational activities (greenspace (ha)) temporarily on an intermittent basis. Dependent on the location of the works there may be temporary adverse effects on public rights of way, railways, roads and other transport or access routes. However, effects on the water environment are expected to be negligible.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	Increased leakage reduction will result in the reduction of water lost in the supply network and therefore the energy and chemicals used to treat it. The scheme will help to reduce the overall water demand for the region by 30Ml/d by the end of the scheme delivery period and result in a proportionate reduction of leakage from the water supply system, with small beneficial effects on materials and resource use. Resources for pipework renewal are relatively modest, but the scheme will require some use of materials at a scale consistent with the size of the scheme.	Medium	Moderate	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with small beneficial effects likely to arise for water quality within the zone of influence of Yorkshire Water's sources of supply.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with moderate beneficial effects likely to arise for sustainable water resources and reducing the need for development of new water sources.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works could be located within or in proximity to Flood Risk Zones 2 and 3. As such temporary mitigation measures may be required to alleviate flood risk. However, there will be no permanent land-take within floodplains and no new above-ground infrastructure, so impacts are expected to be negligible.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	This scheme will improve the efficiency of water use by reducing operational losses through leakage and helping to promote water efficiency to Yorkshire Water customers and result in reduced per capita consumption. The scale of water savings (30Ml/d by the end of the scheme delivery period) is assessed as providing a moderate beneficial effect.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Accessing water pipes in order to replace or repair them, or to install loggers and meters, will require excavations to the level of the existing pipes concentrated in urban/suburban areas – this will be a small-scale impact on soils and have no greater than a negligible effect. The impacts of this on the soils in the local area will be mitigated by best practice construction methods, and the ground will be re-instated so there no long-term adverse effects are anticipated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	The scheme may result in temporary, intermittent and localised increases in air emissions and dust arising from vehicle movements associated with activities such as mains replacement and repair.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	The scheme may result in temporary intermittent increases in GHG emissions arising from vehicle movements associated with mains replacement and repair and installation of meters and loggers.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will help increase resilience to climate change as the overall loss of water from the system will be reduced (30Ml/d by the end of the scheme delivery period), reducing the water demand on the supply system.	Medium	Moderate	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The excavations and works associated with mains replacement or repair, or to install loggers and meters will take place in previously disturbed ground thus the potential for adverse impacts upon known and unknown buried historical assets and above ground heritage assets is negligible.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The excavations and works associated with mains replacement or repair, or to install loggers and meters have the potential for temporary, small adverse impact on both designated and undesignated landscapes and townscapes temporarily. Visual amenity will not be affected in the long term as once pipes are replaced or repaired they will be re-buried and the land re-instated.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	**L3 Active leakage control 46Ml/d**
Scheme description	The option involves a combination of active leakage control (including new techniques such as acoustic logging and satellite technology), trunk main leakage detection, mains and service pipe relining/renewal, pressure management and smart metering technology. The option aims to drive down leakage to a reduced target and maintain at that level.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	Mains replacement and repair and acoustic logging will require excavation to access water pipes. Pressure management leakage control measures will also require very limited excavation activity to install pressure management valves. These activities will be temporary and concentrated in urban/suburban areas where impacts on designated sites or other sites of conservation importance are unlikely. Impacts of the work on local non-designated habitats are likely to be no greater than negligible. This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with small beneficial effects likely to arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a small beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage control.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and and repair of leakage, mains replacement/repaire is unlikely to spread INNS between sites.	Small	Medium	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Excavation work, transport of materials and traffic disruption may also give rise to temporary nuisance from noise, dust and vibration when sited close to areas of population density. Effects are unlikely to be any greater than negligible adverse given the scale of the activities required and with best practice construction methods applied. The scheme will help to ensure levels of service are maintained through enabling provision of water that would have otherwise been lost to leakage and increased supply system reinforcements (46Ml/d by the end of the scheme).	Medium	Moderate	Medium-term	Temporary	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Mains replacement and repair activities have the potential to disrupt some recreational activities (greenspace (ha)) temporarily on an intermittent basis. Dependent on the location of the works there may be temporary adverse effects on public rights of way, railways, roads and other transport or access routes. However, effects on the water environment are expected to be negligible.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	Increased leakage reduction will result in the reduction of water lost in the supply network and therefore the energy and chemicals used to treat it. The scheme will help to reduce the overall water demand for the region by 46Ml/d by the end of the scheme delivery period and result in a proportionate reduction of leakage from the water supply system, with small beneficial effects on materials and resource use. Resources for pipework renewal are relatively modest, but the scheme will require some use of materials at a scale consistent with the size of the scheme.	Medium	Moderate	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with small beneficial effects likely to arise for water quality within the zone of influence of Yorkshire Water's sources of supply.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with moderate beneficial effects likely to arise for sustainable water resources and reducing the need for development of new water sources.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works could be located within or in proximity to Flood Risk Zones 2 and 3. As such temporary mitigation measures may be required to alleviate flood risk. However, there will be no permanent land-take within floodplains and no new above-ground infrastructure, so impacts are expected to be negligible.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.4 To increase awareness of water sustainability and efficient use of water.	This scheme will improve the efficiency of water use by reducing operational losses through leakage and helping to promote water efficiency to Yorkshire Water customers and result in reduced per capita consumption. The scale of water savings (46Ml/d by the end of the scheme delivery period) is assessed as providing a moderate beneficial effect.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Accessing water pipes in order to replace or repair them, or to install loggers and meters, will require excavations to the level of the existing pipes concentrated in urban/suburban areas – this will be a small-scale impact on soils and have no greater than a negligible effect. The impacts of this on the soils in the local area will be mitigated by best practice construction methods, and the ground will be re-instated so there no long-term adverse effects are anticipated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	The scheme may result in temporary, intermittent and localised increases in air emissions and dust arising from vehicle movements associated with activities such as mains replacement and repair.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	The scheme may result in temporary intermittent increases in GHG emissions arising from vehicle movements associated with mains replacement and repair and installation of meters and loggers.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will help increase resilience to climate change as the overall loss of water from the system will be reduced (46Ml/d by the end of the scheme delivery period), reducing the water demand on the supply system.	Medium	Moderate	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The excavations and works associated with mains replacement or repair, or to install loggers and meters will take place in previously disturbed ground thus the potential for adverse impacts upon known and unknown buried historical assets and above ground heritage assets is negligible.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The excavations and works associated with mains replacement or repair, or to install loggers and meters have the potential for temporary, small adverse impact on both designated and undesignated landscapes and townscapes temporarily. Visual amenity will not be affected in the long term as once pipes are replaced or repaired they will be re-buried and the land re-instated.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	**L4 Active leakage control 63Ml/d**
Scheme description	The option involves a combination of active leakage control (including new techniques such as acoustic logging and satellite technology), trunk main leakage detection, mains and service pipe relining/renewal, pressure management and smart metering technology. The option aims to drive down leakage to a reduced target and maintain at that level.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	Mains replacement and repair and acoustic logging will require excavation to access water pipes. Pressure management leakage control measures will also require very limited excavation activity to install pressure management valves. These activities will be temporary and concentrated in urban/suburban areas where impacts on designated sites or other sites of conservation importance are unlikely. Impacts of the work on local non-designated habitats are likely to be no greater than negligible. This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with minor beneficial effects likely to arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply.	Small	Moderate	Medium-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a small beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage control.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and and repair of leakage, mains replacement/repaire is unlikely to spread INNS between sites.	Small	Medium	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Excavation work, transport of materials and traffic disruption may also give rise to temporary nuisance from noise, dust and vibration when sited close to areas of population density. Effects are unlikely to be any greater than minor adverse given the scale of the activities required and with best practice construction methods applied. The scheme will help to ensure levels of service are maintained through enabling provision of water that would have otherwise been lost to leakage and increased supply system reinforcements (63Ml/d by the end of the scheme).	Medium	Moderate	Medium-term	Temporary	Medium (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Mains replacement and repair activities have the potential to disrupt some recreational activities (greenspace (ha)) temporarily on an intermittent basis. Dependent on the location of the works there may be temporary adverse effects on public rights of way, railways, roads and other transport or access routes. However, effects on the water environment are expected to be negligible.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	Increased leakage reduction will result in the reduction of water lost in the supply network and therefore the energy and chemicals used to treat it. The scheme will help to reduce the overall water demand for the region by 63Ml/d by the end of the scheme delivery period and result in a proportionate reduction of leakage from the water supply system, with major beneficial effects on materials and resource use. Resources for pipework renewal are relatively modest, but the scheme will require some use of materials at a scale consistent with the size of the scheme.	Medium	Moderate	Long-term	Permanent	Medium (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Major beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with minor beneficial effects likely to arise for water quality within the zone of influence of Yorkshire Water's sources of supply.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with major beneficial effects likely to arise for sustainable water resources and reducing the need for development of new water sources.	Medium	High	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works could be located within or in proximity to Flood Risk Zones 2 and 3. As such temporary mitigation measures may be required to alleviate flood risk. However, there will be no permanent land-take within floodplains and no new above-ground infrastructure, so impacts are expected to be negligible.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.4 To increase awareness of water sustainability and efficient use of water.	This scheme will improve the efficiency of water use by reducing operational losses through leakage and helping to promote water efficiency to Yorkshire Water customers and result in reduced per capita consumption. The scale of water savings (63Ml/d by the end of the scheme delivery period) is assessed as providing a major beneficial effect.	Medium	High	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Accessing water pipes in order to replace or repair them, or to install loggers and meters, will require excavations to the level of the existing pipes concentrated in urban/suburban areas – this will be a small-scale impact on soils and have no greater than a negligible effect. The impacts of this on the soils in the local area will be mitigated by best practice construction methods, and the ground will be re-instated so there no long-term adverse effects are anticipated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	The scheme may result in temporary, intermittent and localised increases in air emissions and dust arising from vehicle movements associated with activities such as mains replacement and repair.	Small	High	Short-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	The scheme may result in temporary intermittent increases in GHG emissions arising from vehicle movements associated with mains replacement and repair and installation of meters and loggers.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will help increase resilience to climate change as the overall loss of water from the system will be reduced (63Ml/d by the end of the scheme delivery period), reducing the water demand on the supply system.	Medium	Moderate	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The excavations and works associated with mains replacement or repair, or to install loggers and meters will take place in previously disturbed ground thus the potential for adverse impacts upon known and unknown buried historical assets and above ground heritage assets is negligible.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The excavations and works associated with mains replacement or repair, or to install loggers and meters have the potential for temporary, small adverse impact on both designated and undesignated landscapes and townscapes temporarily. Visual amenity will not be affected in the long term as once pipes are replaced or repaired they will be re-buried and the land re-instated.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	**L5 Active leakage control 79 Ml/d**
Scheme description	The option involves a combination of active leakage control (including new techniques such as acoustic logging and satellite technology), trunk main leakage detection, mains and service pipe relining/renewal, pressure management and smart metering technology. The option aims to drive down leakage to a reduced target and maintain at that level.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	Mains replacement and repair and acoustic logging will require excavation to access water pipes. Pressure management leakage control measures will also require very limited excavation activity to install pressure management valves. These activities will be temporary and concentrated in urban/suburban areas where impacts on designated sites or other sites of conservation importance are unlikely. Impacts of the work on local non-designated habitats are likely to be no greater than negligible. This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with minor beneficial effects likely to arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply.	Small	Moderate	Medium-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a small beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage control.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and and repair of leakage, mains replacement/repaire is unlikely to spread INNS between sites.	Small	Medium	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Excavation work, transport of materials and traffic disruption may also give rise to temporary nuisance from noise, dust and vibration when sited close to areas of population density. Effects are unlikely to be any greater than minor adverse given the scale of the activities required and with best practice construction methods applied. The scheme will help to ensure levels of service are maintained through enabling provision of water that would have otherwise been lost to leakage and increased supply system reinforcements (79 Ml/d by the end of the scheme).	Medium	Moderate	Medium-term	Temporary	Medium (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Mains replacement and repair activities have the potential to disrupt some recreational activities (greenspace (ha)) temporarily on an intermittent basis. Dependent on the location of the works there may be temporary adverse effects on public rights of way, railways, roads and other transport or access routes. However, effects on the water environment are expected to be negligible.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	Increased leakage reduction will result in the reduction of water lost in the supply network and therefore the energy and chemicals used to treat it. The scheme will help to reduce the overall water demand for the region by 79 Ml/d by the end of the scheme delivery period and result in a proportionate reduction of leakage from the water supply system, with major beneficial effects on materials and resource use. Resources for pipework renewal are relatively modest, but the scheme will require some use of materials at a scale consistent with the size of the scheme.	Medium	Moderate	Long-term	Permanent	Medium (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Major beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with minor beneficial effects likely to arise for water quality within the zone of influence of Yorkshire Water's sources of supply.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with major beneficial effects likely to arise for sustainable water resources and reducing the need for development of new water sources.	Medium	High	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works could be located within or in proximity to Flood Risk Zones 2 and 3. As such temporary mitigation measures may be required to alleviate flood risk. However, there will be no permanent land-take within floodplains and no new above-ground infrastructure, so impacts are expected to be negligible.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.4 To increase awareness of water sustainability and efficient use of water.	This scheme will improve the efficiency of water use by reducing operational losses through leakage and helping to promote water efficiency to Yorkshire Water customers and result in reduced per capita consumption. The scale of water savings (79 Ml/d by the end of the scheme delivery period) is assessed as providing a major beneficial effect.	Medium	High	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Accessing water pipes in order to replace or repair them, or to install loggers and meters, will require excavations to the level of the existing pipes concentrated in urban/suburban areas – this will be a small-scale impact on soils and have no greater than a negligible effect. The impacts of this on the soils in the local area will be mitigated by best practice construction methods, and the ground will be re-instated so there no long-term adverse effects are anticipated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	The scheme may result in temporary, intermittent and localised increases in air emissions and dust arising from vehicle movements associated with activities such as mains replacement and repair.	Small	High	Short-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	The scheme may result in temporary intermittent increases in GHG emissions arising from vehicle movements associated with mains replacement and repair and installation of meters and loggers.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will help increase resilience to climate change as the overall loss of water from the system will be reduced (79 Ml/d by the end of the scheme delivery period), reducing the water demand on the supply system.	Medium	Moderate	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The excavations and works associated with mains replacement or repair, or to install loggers and meters will take place in previously disturbed ground thus the potential for adverse impacts upon known and unknown buried historical assets and above ground heritage assets is negligible.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The excavations and works associated with mains replacement or repair, or to install loggers and meters have the potential for temporary, small adverse impact on both designated and undesignated landscapes and townscapes temporarily. Visual amenity will not be affected in the long term as once pipes are replaced or repaired they will be re-buried and the land re-instated.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	**L6 Active leakage control 95 Ml/d**
Scheme description	The option involves a combination of active leakage control (including new techniques such as acoustic logging and satellite technology), trunk main leakage detection, mains and service pipe relining/renewal, pressure management and smart metering technology. The option aims to drive down leakage to a reduced target and maintain at that level.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	Mains replacement and repair and acoustic logging will require excavation to access water pipes. Pressure management leakage control measures will also require very limited excavation activity to install pressure management valves. These activities will be temporary and concentrated in urban/suburban areas where impacts on designated sites or other sites of conservation importance are unlikely. Impacts of the work on local non-designated habitats are likely to be no greater than negligible. This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with minor beneficial effects likely to arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply.	Small	Moderate	Medium-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	This scheme may have a small beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage control.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is little risk of introducing INNS during scheme implementation, and and repair of leakage, mains replacement/repaire is unlikely to spread INNS between sites.	Small	Medium	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Excavation work, transport of materials and traffic disruption may also give rise to temporary nuisance from noise, dust and vibration when sited close to areas of population density. Effects are unlikely to be any greater than minor adverse given the scale of the activities required and with best practice construction methods applied. The scheme will help to ensure levels of service are maintained through enabling provision of water that would have otherwise been lost to leakage and increased supply system reinforcements (95Ml/d by the end of the scheme).	Medium	Moderate	Medium-term	Temporary	Medium (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Mains replacement and repair activities have the potential to disrupt some recreational activities (greenspace (ha)) temporarily on an intermittent basis. Dependent on the location of the works there may be temporary adverse effects on public rights of way, railways, roads and other transport or access routes. However, effects on the water environment are expected to be negligible.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	Increased leakage reduction will result in the reduction of water lost in the supply network and therefore the energy and chemicals used to treat it. The scheme will help to reduce the overall water demand for the region by 95Ml/d by the end of the scheme delivery period and result in a proportionate reduction of leakage from the water supply system, with major beneficial effects on materials and resource use. Resources for pipework renewal are relatively modest, but the scheme will require some use of materials at a scale consistent with the size of the scheme.	Medium	Moderate	Long-term	Permanent	Medium (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Major beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with minor beneficial effects likely to arise for water quality within the zone of influence of Yorkshire Water's sources of supply.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option will help to reduce abstraction of water or at least limit any additional abstraction requirements with major beneficial effects likely to arise for sustainable water resources and reducing the need for development of new water sources.	Medium	High	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works could be located within or in proximity to Flood Risk Zones 2 and 3. As such temporary mitigation measures may be required to alleviate flood risk. However, there will be no permanent land-take within floodplains and no new above-ground infrastructure, so impacts are expected to be negligible.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.4 To increase awareness of water sustainability and efficient use of water.	This scheme will improve the efficiency of water use by reducing operational losses through leakage and helping to promote water efficiency to Yorkshire Water customers and result in reduced per capita consumption. The scale of water savings (95Ml/d by the end of the scheme delivery period) is assessed as providing a major beneficial effect.	Medium	High	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Accessing water pipes in order to replace or repair them, or to install loggers and meters, will require excavations to the level of the existing pipes concentrated in urban/suburban areas – this will be a small-scale impact on soils and have no greater than a negligible effect. The impacts of this on the soils in the local area will be mitigated by best practice construction methods, and the ground will be re-instated so there no long-term adverse effects are anticipated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	The scheme may result in temporary, intermittent and localised increases in air emissions and dust arising from vehicle movements associated with activities such as mains replacement and repair.	Small	High	Short-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	The scheme may result in temporary intermittent increases in GHG emissions arising from vehicle movements associated with mains replacement and repair and installation of meters and loggers.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme will help increase resilience to climate change as the overall loss of water from the system will be reduced (95 Ml/d by the end of the scheme delivery period), reducing the water demand on the supply system.	Medium	Moderate	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The excavations and works associated with mains replacement or repair, or to install loggers and meters will take place in previously disturbed ground thus the potential for adverse impacts upon known and unknown buried historical assets and above ground heritage assets is negligible.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The excavations and works associated with mains replacement or repair, or to install loggers and meters have the potential for temporary, small adverse impact on both designated and undesignated landscapes and townscapes temporarily. Visual amenity will not be affected in the long term as once pipes are replaced or repaired they will be re-buried and the land re-instated.	Medium	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	DV3 - South Yorkshire GW
Scheme description	This scheme is to provide new groundwater abstraction from Magnesian Limestone with treatment at new works and then transfer via a short length of new pipeline to connect to the Grid supply (5Ml/d yield assuming 3 boreholes collectively supplying this yield). This scheme is comprised of the following elements: Abstraction from 3 new boreholes and partial treatment (new works). New duty and raw water standby raw water pumps at new works A new 225mm pipeline (1.1km) to connect new works to existing Grid main.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The proposed scheme is within 20km of three internationally designated sites - Hatfield Moor SAC, Thorne Moor SAC and Thorne & Hatfield Moor SPA. Groundwater reduction is not likely to impact upon the water-dependant qualifying features of these sites (raised bogs and nightjars) as the designated sites are not likely to be hydrologically connected to the aquifer associated with the boreholes and groundwater reduction associated with this scheme and as such the HRA has concluded no likely significant effects. There are a number of SSSIs within 10km of the scheme but they are not designated for features that are likely to be impacted by this scheme during either construction or operation. There is one area of ancient woodland within 1km of the scheme that may be negatively affected during construction. It is assumed best practice construction would be employed to minimise effects. There are no GWDTE nearby. Overall negligible negative effects are anticipated.	Small	Moderate	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets in the area and have adverse effects on associated services e.g. biodiversity, tranquillity, but these effects would be small-scale and temporary. There are no sites recognised for their natural capital value within proximity of the scheme.	Small	Low	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of spreading terrestrial INNS through construction activities. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. Operation of the scheme is not expected to introduce or spread INNS.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 10 biodiversity units would be lost during construction of the 1.1km pipeline and the new works; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement.	Small	Low	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The construction phase of the scheme may result in noise, dust and vibration impacts. The construction will be a relatively rural area, and therefore will not cause negative effects for large numbers of people. However, the residents near to the residential road will be subject to adverse effects. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through the local authority. After mitigation, residual construction effects will be of low magnitude. The scheme would deliver 5Ml/d helping to maintain essential public water supplies and therefore help maintain public health and well-being. However, there will be a high cost relative to benefit provided which needs to be recognised when considering overall affordability of water bills. Construction may result in a small increase in local employment levels, aiding the local economy.	Small	Moderate (adverse) High (beneficial)	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low	Medium	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction is not within close proximity of any sites designated for their recreational value and therefore no effects, positive or negative, are anticipated. Within 2km are the following assets: Brodsworth Community Woodland, Highfields Country Park and the Trans-Pennine Trail Strategic Route, but due to the nature and scale of the construction, these are not anticipated to experience negative effects.	Small	Moderate	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help to reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (three boreholes and 1.1km pipeline). Resources for construction of additional components to the scheme will be sourced locally where possible. The scheme will make use of existing infrastructure where possible (e.g. connection to existing Grid main). Once operational, the scheme will involve the use of non-renewable materials such as chemicals associated with the treatment process (e.g. chemical dosing) and will require power for pumping. There is no potential within this scheme for reduction in leakage.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Pollution risks from construction activity should be mitigated by best practice methods. The abstraction would be from a WFD groundwater body which is currently classified as of poor chemical status. There is no risk of deterioration in chemical status at a groundwater body scale, although local impacts may be expected. There are no impacts on surface water quality associated with the scheme.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from the WFD groundwater body, which is classified as good status for water balance, impact on rivers and impact on wetlands. The volume of abstraction posed from groundwater is not likely to impact upon water balance status. Increased abstraction may lead to reduced groundwater levels with potential for changes in recharge profiles but there is limited information to quantify this effect. There are unlikely to be any impacts to dependent surface waterbody status or GWDTE test status. Negligible effects are anticipated.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The new infrastructure would be located in Flood Zone 1 and have a low probability of flooding, so mitigation is not likely to be required. There will be only a small area of above ground land-take in Flood Zone 1 once the scheme is operational (0.1ha), therefore the permanent effects of the new pumping station and partial treatment works on flood storage are assessed as negligible, accounting for additional pressures due to climate change.	Small	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme would not have direct effects on water efficiency. The scheme does not directly contribute towards improving the awareness of water sustainability and its true value.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	There are no sites designated for their geological interest within proximity of the scheme. The potential effects on soil associated with the construction work (pipeline trenching/tunnelling of 1.1km) are considered temporary and reversible. The pipeline would cross 1km of Agricultural Land Classification 2. The boreholes only cover a small land area and the pipeline would be buried so would only have temporary effects. The pipeline would not intersect any historic or currently permitted landfill sites. No long-term adverse effects are anticipated on geology, soils or overall land-use management.	Small	Moderate	Long-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with the construction phase would generate temporary air emissions and dust. These will be minimised through best practice construction techniques. There are no AQMAs in close proximity to the scheme. The new works (pumps and partial treatment plant) will emit air pollutants during operation. Emissions will be minimised through best available techniques.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Scheme construction would be associated with GHG emissions from HGV movements and construction activities. Construction work and vehicle movements associated with construction phase will give rise to temporary GHG emissions over the short term, but these will be minimised through best construction practices. Operation of the scheme will require some additional annual energy consumption associated with increased groundwater pumping and minor additional water treatment chemical use, with a minor adverse impact on greenhouse gas emissions.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scale of this scheme would make a small contribution to securing a resilient water supply in the longer term to help meet the challenges of climate change impact on water supply reliability.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The pipeline route is in close proximity to the Roman Ridge Scheduled Monument. However, construction of the scheme is not expected to adversely affect this site. Construction work has the potential to disturb unknown buried assets, however this would be further evaluated by desk studies and other investigations prior to construction. A watching brief, surveys and investigation would be implemented if required during construction, to reduce the risk of adverse impact to any unknown heritage assets. There are 2 Grade II Listed Buildings within 1km of the pipeline, but they are not likely to experience impacts to their setting. No negative effects are anticipated during operation.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are no statutory landscape designations in proximity to the scheme, however, construction of the pipeline may have medium-term, temporary impacts upon local non-statutory landscape designations (the scheme would be within the Doncaster District of the Liverpool, Manchester and West Yorkshire Greenbelt). The new treatment works could have a minor impact at most on visual landscape, assuming appropriate screening will be adopted where necessary.	Small	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	DV6 (iv) - South Yorkshire Pipeline
Scheme description	This scheme is to transfer 50 Ml/d of partially treated water from the abstraction point on the Tees to an existing WTW via a new pipeline. This scheme is comprised of the following elements: • Abstraction (50Ml/d) and partial treatment. • A new 900mm pipeline (139km) direct to a WTW from source, with four booster stations along the route. • New duty and standby raw water pumps in existing housing. • Four booster pumping stations and associated infrastructure. • New water treatment infrastructure (for partial treatment) including bankside storage and new pumps to pass flow through treatment stages (including removal of particulates down to 5 micron to enable INNS removal). • Additional treatment stream at a WTW, including blending and holding tanks located within the existing works footprint. • 50 Ml/d available to put into supply at the WTW.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	There are four International designated sites within 10km of the scheme, including the Kirk Deighton SAC, Denby Grange Colliery Ponds SAC, South Pennine Moors SAC and Peak District Moors (South Pennine Moors) Phase 1 SPA. The proposed pipeline to WTW falls within ~1.7km of the South Pennine Moors SAC and Peak District Moors SPA at its closest point. There are potential impact pathways during construction of the pipeline on air quality including an increase in nitrogen deposition and dust, and noise/ visual disturbance. However, due to the distance between the proposed pipeline and the designated site, no LSE are anticipated. The HRA has also considered the Teesmouth and Cleveland Coast SPA and Teesmouth and Cleveland Coast Ramsar site which are in hydrological connectivity to the River Tees and has concluded no likely significant effects on the designated features of these sites. There are five SSSIs within 1km of the proposed pipeline, of which two are in close proximity (~100m) to the route. In addition there are 129 areas of ancient woodland within 1km of the proposed pipeline, of which 13 are within close proximity (~100m) and one is intersected multiple times to the east of Wharncliffe Side. There are five further local nature reserves within 1km of the proposed pipeline, of which one is intersected to the north of Notton. Construction would generate indirect effects on the above sensitive ecological designations (SSSIs, ancient woodlands, LNR) through dust emissions and noise disturbance. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise these impacts. The construction of the pipeline may also have adverse effects towards a number of priority habitat areas adjacent to the pipeline route, including Coastal and Floodplain Grazing Marsh and Good quality semi-improved grassland habitats. Consultation with Natural England regarding detailed design and mitigation for impacts on the designated sites and priority habitat areas would be required during project planning (e.g. use of trenchless technology/tunnelling).	Large	Moderate	Medium-term	Temporary	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme due to partial treatment to remove INNS prior to transfer.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 1486 biodiversity units would be lost during construction of the new works and pipeline (under a worst case scenario). For areas of habitat affected by construction, for example, along the 139km of pipeline, this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement, in particular grassland and woodland habitat local to the scheme.	Large	Moderate	Medium-term	Permanent	Medium	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	For the majority of its length, the proposed pipeline route runs through agricultural land, woodlands and grassland or is adjacent to main roads. However, there are areas where the pipeline construction work would come in proximity to a number of residential areas peripheral to several larger urban areas, including Sheffield, Barnsley, Wakefield, Leeds, Wetherby, Harrogate and Darlington. Scheme construction has the potential for some temporary adverse effects, such as nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. The scheme would deliver 50 Ml/d helping to maintain essential public water supplies and therefore help maintain public health and well-being.	Large	Moderate (adverse) High (beneficial)	Medium-term	Temporary (adverse) Permanent (beneficial)	Medium	Medium	Moderate adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Given the scale of the scheme pipeline construction, construction activity will have a moderate temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities such as playing fields, public parks, golf courses, public paths and rights of way (PRoW). The proposed pipeline further intersects the national cycle network at multiple points. These effects will be mitigated as far as possible, such as footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. The proposed pipeline intersects one area east of Wakefield which is highly deprived according to the English IMD (2019) and may therefore affect access to recreational resources for users living within this deprived area. Operation of the scheme is not anticipated to have any significant adverse impacts on the water environment for other users.	Large	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme (new pipeline of 139km length, new pumping stations, booster stations, new WTW infrastructure including additional treatment streams). Once operational, further material inputs will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. The WFD assessment concluded there is unlikely to be deterioration in water quality in the WFD water body. Approximately 13.5km of the proposed pipeline route intersects source protection zones 2 and 3.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from a WFD water body. The WFD assessment identified that the flow reductions as a result of this option are significant and may impact aquatic habitats, however, low flows would be protected by the existing maintained flow condition within Northumbrian Water's existing license and additional river regulation (within existing licence) to support abstraction, where required. As a result, there is unlikely to be a deterioration in WFD status associated with the scheme. Further detailed assessment and information on the operating regime of the scheme would be required to provide further certainty regarding the WFD assessment conclusions. Abstraction would be from a waterbody designated as with less than 30% resource availability.	Medium	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The pipeline would be located within Flood Risk Zone 2 and 3 for approximately 10 km of length. Temporary mitigation measures may be required to alleviate flood risk. In operation, the pipeline would be below ground and the pumping station would only have a small footprint above ground. The new water treatment infrastructure for partial treatment would not be located within an area of existing flood risk. The WTW that would undergo upgrade works is in close proximity to Flood Risk Zones 2 and 3 of the River Rivelin, however the expansion of capacity at the WTW would require only a small increase in site footprint. Taking into account additional pressures due to climate change, the effects on flood storage are therefore assessed as moderate (subject to the findings of any Flood Risk Assessment).	Medium	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	There is one SSSI of geological interest in close proximity (~100m) of the proposed pipeline and a further site within 1km. The scheme pipeline would require temporary land take within a large quantity of greenfield, best and most versatile agricultural land (Agricultural Land Classification Grade 3), and a small quantity of Agricultural Land Classification Grade 1 and Agricultural Land Classification Grade 2 land, of medium to high value. There are additionally 58 historic landfill sites and 11 permitted waste sites within 1km of the proposed pipeline route, of which seven historic landfill sites are in close proximity (~100m) and one permitted waste site would be adjacent to a small section of the pipeline. During construction of this therefore presents a potential land contamination risk. Overall, the potential effects on soil associated with the construction work (pipeline trenching/tunnelling) are considered temporary and reversible. As such, the adverse effects as a result of construction activity on land-use would be moderate. The pipeline would be buried so would only have temporary effects.	Large	Medium	Medium-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust for a limited duration. Local air quality impacts will be associated with construction activity and the proposed pipeline intersects two AQMAs for 10km (Sheffield City-wide AQMA and the M62 AQMA). Impacts will be minimised through best practice construction techniques. The increase in vehicle movements associated with the increased operations at the WTW and the additional treatment infrastructure are anticipated to be associated with negligible impacts.	Large	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Given the scale of scheme construction activities (new 139km pipeline, pumping stations, booster stations, new WTW infrastructure including additional treatment streams), a large quantity of carbon emissions are anticipated from HGV movements and construction activities. During operation there would also be an increase in energy use associated with further material inputs which will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute 50Ml/d to secure a supply-demand balance over the next 25 years, improving resilience to the threats of climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are four registered park and gardens, 31 scheduled monuments and numerous listed buildings within 1km of the scheme construction zone, of which two scheduled monuments and 31 listed buildings (Grade II and II*) are located in close proximity (~100m) to the route. There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	A small area of the proposed pipeline (~800m) intersects the Peak District National Park to the west of Sheffield and a larger area (~6km) is situated within 1km of the national park. Adverse effects towards the setting of the national park due to increased HGV movements during construction of the pipeline would be temporary. The WTW is also located within the Peak District National Park, however, the upgrades would be constructed within the existing WTW site and the pipeline would not be visible once completed.	Small	Medium	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	DV6 (v) - South Yorkshire Pipeline
Scheme description	This scheme is to transfer 80 Ml/d of partially treated water from abstraction point on the Tees to WTW via a new pipeline. This scheme is comprised of the following elements: • Abstraction (80 Ml/d) and partial treatment). • A new 900mm pipeline (139km) direct to WTW from source, with four booster stations along the route. • New duty and standby raw water pumps in existing housing. • Four booster pumping stations and associated infrastructure. • New pump intake on the Tyne, within existing building. • New water treatment infrastructure (for partial treatment) including bankside storage and new pumps to pass flow through treatment stages (including removal of particulates down to 5 micron to enable INNS removal). • Additional treatment stream at WTW, including blending and holding tanks located within the existing works footprint. • 50 Ml/d available to put into supply at WTW and 30 Ml/d available for onward transfer.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	There are four International designated sites within 10km of the scheme, including the Kirk Deighton SAC, Denby Grange Colliery Ponds SAC, South Pennine Moors SAC and Peak District Moors (South Pennine Moors) Phase 1 SPA. The proposed pipeline falls within ~1.7km of the South Pennine Moors SAC and Peak District Moors SPA at its closest point. There are potential impact pathways during construction of the pipeline on air quality including an increase in nitrogen deposition and dust, and noise/ visual disturbance. However, due to the distance between the proposed pipeline and the designated site, no LSE are anticipated. The HRA has also considered the Teesmouth and Cleveland Coast SPA and Teesmouth and Cleveland Coast Ramsar site which are in hydrological connectivity to the River Tees and has concluded no likely significant effects on the designated features of these sites. There are five SSSIs within 1km of the proposed pipeline, of which two are in close proximity (~100m) to the route. In addition, there are 129 areas of ancient woodland within 1km of the proposed pipeline, of which 13 are within close proximity (~100m) and one is intersected multiple times. There are five further local nature reserves within 1km of the proposed pipeline, of which one is intersected. Construction would generate indirect effects on the above sensitive ecological designations (SSSIs, ancient woodlands, LNR) through dust emissions and noise disturbance. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise these impacts. The construction of the pipeline may also have adverse effects towards a number of priority habitat areas adjacent to the pipeline route, including Coastal and Floodplain Grazing Marsh and Good quality semi-improved grassland habitats. Consultation with Natural England regarding detailed design and mitigation for impacts on the designated sites and priority habitat areas would be required during project planning (e.g. use of trenchless technology/tunnelling).	Large	Moderate	Medium-term	Temporary	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme due to partial treatment to remove INNS prior to transfer.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 1518 biodiversity units would be lost during construction of the new works and pipeline (under a worst case scenario). For areas of habitat affected by construction, for example, along the 139km of pipeline, this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement, in particular grassland and woodland habitat local to the scheme.	Large	Moderate	Medium-term	Permanent	Medium	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	For the majority of its length, the proposed pipeline route runs through agricultural land, woodlands and grassland or is adjacent to main roads. However there are areas where the pipeline construction work would come in proximity to a number of residential areas peripheral to several larger urban areas, including Sheffield, Barnsley, Wakefield, Leeds, Wetherby, Harrogate and Darlington. Scheme construction has the potential for some temporary adverse effects, such as nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. The scheme would deliver 80 Ml/d helping to maintain essential public water supplies and therefore help maintain public health and well-being.	Large	Moderate (adverse) High (beneficial)	Medium-term	Temporary (adverse) Permanent (beneficial)	Medium	Medium	Moderate adverse	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Given the scale of the scheme pipeline construction, construction activity will have a moderate temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities such as playing fields, public parks, golf courses, public paths and rights of way (PRoW). The proposed pipeline further intersects the national cycle network at multiple points. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. The proposed pipeline intersects one area east of Wakefield which is highly deprived according to the English IMD (2019) and may therefore affect access to recreational resources for users living within this deprived area. Operation of the scheme is not anticipated to have any significant adverse impacts on the water environment for other users.	Large	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme (new pipeline of 139km length, new pumping stations, booster stations, new WTW infrastructure including additional treatment streams). Once operational, further material inputs will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. The WFD assessment concluded there is unlikely to be deterioration in water quality in the WFD water body. Approximately 13.5km of the proposed pipeline route intersects source protection zones 2 and 3.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from a WFD water body. The WFD assessment identified that the flow reductions as a result of this option are significant and may impact aquatic habitats, however, low flows would be protected by the existing maintained flow condition within Northumbrian Water's existing licence and additional river regulation (within existing licence) to support abstraction, where required. As a result, there is unlikely to be a deterioration in WFD status associated with the scheme. Further detailed assessment and information on the operating regime of the scheme would be required to provide further certainty regarding the WFD assessment conclusions. Abstraction would be from a waterbody designated as with less than 30% resource availability.	Medium	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The pipeline would be located within Flood Risk Zone 2 and 3 for approximately 10 km of length. Temporary mitigation measures may be required to alleviate flood risk. In operation, the pipeline would be below ground and the pumping station would only have a small footprint above ground. The new water treatment infrastructure for partial treatment would not be located within an area of existing flood risk. The WTW that would undergo upgrade works is in close proximity to Flood Risk Zones 2 and 3 of the River Rivelin, however the expansion of capacity at the WTW would require only a small increase in site footprint. Taking into account additional pressures due to climate change, the effects on flood storage are therefore assessed as moderate (subject to the findings of any Flood Risk Assessment).	Medium	Moderate	Medium-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	There is one SSSI of geological interest in close proximity (~100m) of the proposed pipeline and a further site within 1km. The scheme pipeline would require temporary land take within a large quantity of greenfield, best and most versatile agricultural land (Agricultural Land Classification Grade 3), and a small quantity of Agricultural Land Classification Grade 1 and Agricultural Land Classification Grade 2 land, of medium to high value. There are additionally 58 historic landfill sites and 11 permitted waste sites within 1km of the proposed pipeline route, of which seven historic landfill sites are in close proximity (~100m) and one permitted waste site would be adjacent a small section of the pipeline. During construction of this therefore presents a potential land contamination risk. Overall, the potential effects on soil associated with the construction work (pipeline trenching/tunnelling) are considered temporary and reversible. As such, the adverse effects as a result of construction activity on land-use would be moderate. The pipeline would be buried so would only have temporary effects.	Large	Medium	Medium-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust for a limited duration. Local air quality impacts will be associated with construction activity and the proposed pipeline intersects two AQMAs for 10km (Sheffield City-wide AQMA and the M62 AQMA). Impacts will be minimised through best practice construction techniques. The increase in vehicle movements associated with the increased operations at the WTW and the additional treatment infrastructure are anticipated to be associated with negligible impacts.	Large	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Given the scale of scheme construction activities (new 139km pipeline, pumping stations, booster stations, new WTW infrastructure including additional treatment streams), a large quantity of carbon emissions are anticipated from HGV movements and construction activities. During operation there would also be an increase in energy use associated with further material inputs which will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute 80Ml/d to a secure supply-demand balance over the next 25 years, improving resilience to the threats of climate change.	Medium	High	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are four registered park and gardens, 31 scheduled monuments and numerous listed buildings within 1km of the scheme construction zone, of which two scheduled monuments and 31 listed buildings (Grade II and II*) are located in close proximity (~100m) to the route. There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	A small area of the proposed pipeline (~800m) intersects the Peak District National Park to the west of Sheffield and a larger area (~6km) is situated within 1km of the national park. Adverse effects towards the setting of the national park due to increased HGV movements during construction of the pipeline would be temporary. The WTW is also located within the Peak District National Park, however, the upgrades would be constructed within the existing WTW site and the pipeline would not be visible once completed.	Small	Medium	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	DV6 (vi) - South Yorkshire Pipeline
Scheme description	This scheme is to transfer 140 Ml/d of partially treated water from abstraction point on the Tees to a WTW via a new pipeline. This scheme is comprised of the following elements: • Abstraction (140 Ml/d) and partial treatment). • A new 900mm pipeline (139km) direct to WTW from source, with four booster stations along the route. • New duty and standby raw water pumps in existing housing. • Four booster pumping stations and associated infrastructure. • New pump intake on the Tyne, within existing building. • New water treatment infrastructure (for partial treatment) including bankside storage and new pumps to pass flow through treatment stages (including removal of remove particulates down to 5 micron to enable INNS removal).• Additional treatment stream at WTW, including blending and holding tanks located within the existing works footprint. • 50 Ml/d available to put into supply at WTW and 90 Ml/d available for onward transfer.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	There are four International designated sites within 10km of the scheme, including the Kirk Deighton SAC, Denby Grange Colliery Ponds SAC, South Pennine Moors SAC and Peak District Moors (South Pennine Moors) Phase 1 SPA. The proposed pipeline falls within ~1.7km of the South Pennine Moors SAC and Peak District Moors SPA at its closest point. There are potential impact pathways during construction of the pipeline on air quality including an increase in nitrogen deposition and dust, and noise/ visual disturbance. However, due to the distance between the proposed pipeline and the designated site, no LSE are anticipated. The HRA has also considered the Teesmouth and Cleveland Coast SPA and Teesmouth and Cleveland Coast Ramsar site which are in hydrological connectivity to the River Tees and has concluded no likely significant effects on the designated features of these sites. There are five SSSIs within 1km of the proposed pipeline, of which two are in close proximity (~100m) to the route. In addition, there are 129 areas of ancient woodland within 1km of the proposed pipeline, of which 13 are within close proximity (~100m) and one is intersected multiple times to the east of Wharncliffe Side. There are five further local nature reserves within 1km of the proposed pipeline, of which one is intersected to the north of Notton. Construction would generate indirect effects on the above sensitive ecological designations (SSSIs, ancient woodlands, LNR) through dust emissions and noise disturbance. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise these impacts. The construction of the pipeline may also have adverse effects towards a number of priority habitat areas adjacent to the pipeline route, including Coastal and Floodplain Grazing Marsh and Good quality semi-improved grassland habitats. Consultation with Natural England regarding detailed design and mitigation for impacts on the designated sites and priority habitat areas would be required during project planning (e.g. use of trenchless technology/tunnelling).	Large	Moderate	Medium-term	Temporary	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme due to partial treatment to remove INNS prior to transfer.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 1597 biodiversity units would be lost during construction of the new works and pipeline (under a worst case scenario). For areas of habitat affected by construction, for example, along the 139km of pipeline, this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement, in particular grassland and woodland habitat local to the scheme.	Large	Moderate	Medium-term	Permanent	Medium	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	For the majority of its length, the proposed pipeline route runs through agricultural land, woodlands and grassland or is adjacent to main roads. However there are areas where the pipeline construction work would come in proximity to a number of residential areas peripheral to several larger urban areas, including Sheffield, Barnsley, Wakefield, Leeds, Wetherby, Harrogate and Darlington. Scheme construction has the potential for some temporary adverse effects, such as nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. The scheme would deliver 80 Ml/d helping to maintain essential public water supplies and therefore help maintain public health and well-being.	Large	Moderate (adverse) High (beneficial)	Medium-term	Temporary (adverse) Permanent (beneficial)	Medium	Medium	Moderate adverse	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Given the scale of the scheme pipeline construction, construction activity will have a moderate temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities such as playing fields, public parks, golf courses, public paths and rights of way (PRoW). The proposed pipeline further intersects the national cycle network at multiple points. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. The proposed pipeline intersects one area east of Wakefield which is highly deprived according to the English IMD (2019) and may therefore affect access to recreational resources for users living within this deprived area. Operation of the scheme is not anticipated to have any significant adverse impacts on the water environment for other users.	Large	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme (new pipeline of 139km length, new pumping stations, booster stations, new WTW infrastructure including additional treatment streams). Once operational, further material inputs will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. The WFD assessment concluded there is unlikely to be deterioration in water quality. Approximately 13.5km of the proposed pipeline route intersects source protection zones 2 and 3.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from a WFD water body. The flow reductions as a result of this option are significant and may impact aquatic habitats, however, low flows would be protected by the existing maintained flow condition within Northumbrian Water's existing licence and additional river regulation (within existing licence) to support abstraction, where required. Despite this, this option could reduce many of the moderate flows to the maintained flow condition which would potentially lead to deterioration in the biological status elements. Further detailed assessment and information on the operating regime of the scheme would be required to provide further certainty regarding the WFD assessment conclusions. Abstraction would be from a waterbody designated as with less than 30% resource availability.	Medium	Low	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The pipeline would be located within Flood Risk Zone 2 and 3 for approximately 10 km of length. Temporary mitigation measures may be required to alleviate flood risk. In operation, the pipeline would be below ground and the pumping station would only have a small footprint above ground. The new water treatment infrastructure for partial treatment would not be located within an area of existing flood risk. The WTW that would undergo upgrade works is in close proximity to Flood Risk Zones 2 and 3 of the River Rivelin, however the expansion of capacity would require only a small increase in site footprint. Taking into account additional pressures due to climate change, the effects on flood storage are therefore assessed as moderate (subject to the findings of any Flood Risk Assessment).	Medium	Moderate	Medium-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	There is one SSSI of geological interest in close proximity (~100m) of the proposed pipeline and a further site within 1km. The scheme pipeline would require temporary land take within a large quantity of greenfield, best and most versatile agricultural land (Agricultural Land Classification Grade 3), and a small quantity of Agricultural Land Classification Grade 1 and Agricultural Land Classification Grade 2 land, of medium to high value. There are additionally 58 historic landfill sites and 11 permitted waste sites within 1km of the proposed pipeline route, of which seven historic landfill sites are in close proximity (~100m) and one permitted waste site would be adjacent a small section of the pipeline. During construction of this therefore presents a potential land contamination risk. Overall, the potential effects on soil associated with the construction work (pipeline trenching/tunnelling) are considered temporary and reversible. As such, the adverse effects as a result of construction activity on land-use would be moderate. The pipeline would be buried so would only have temporary effects.	Large	Medium	Medium-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust for a limited duration. Local air quality impacts will be associated with construction activity and the proposed pipeline intersects two AQMAs for 10km (Sheffield City-wide AQMA and the M62 AQMA). Impacts will be minimised through best practice construction techniques. The increase in vehicle movements associated with the increased operations at the WTW and the additional treatment infrastructure are anticipated to be associated with negligible impacts.	Large	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Given the scale of scheme construction activities (new 139km pipeline, pumping stations, booster stations, new WTW infrastructure including additional treatment streams), a large quantity of carbon emissions are anticipated from HGV movements and construction activities. During operation there would also be an increase in energy use associated with further material inputs which will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute 80Ml/d to a secure supply-demand balance over the next 25 years, improving resilience to the threats of climate change.	Medium	High	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are four registered park and gardens, 31 scheduled monuments and numerous listed buildings within 1km of the scheme construction zone, of which two scheduled monuments and 31 listed buildings (Grade II and II*) are located in close proximity (~100m) to the route. There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	A small area of the proposed pipeline (~800m) intersects the Peak District National Park to the west of Sheffield and a larger area (~6km) is situated within 1km of the national park. Adverse effects towards the setting of the national park due to increased HGV movements during construction of the pipeline would be temporary. The WTW is also located within the Peak District National Park, however, the upgrades would be constructed within the existing WTW site and the pipeline would not be visible once completed.	Small	Medium	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	**DV7 (iv) - Ouse Pipeline Option 1**
Scheme description	This scheme is to transfer partially treated water via a new pipeline. This scheme is comprised of the following elements: • Abstraction (50 Ml/d) • New duty and standby raw water pumps in existing housing. • New water treatment infrastructure (for partial treatment) including bankside storage, blending tanks and new pumps to pass flow through treatment stages (including removal of particulates down to 5 micron to enable INNS removal). • New pump at intake on the Tyne, within existing building. • A new 800mm pipeline 85km from Tees to a WTW, with booster station required along the route. • One booster pumping station and associated infrastructure. • Upgrade to existing treatment stream at a WTW, to allow additional 50 MLD through the GAC and contact tanks, including blending and holding tanks located within the existing works footprint. • 50 Ml/d available to put into supply at a WTW.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	There are seven European designated site within 10km of the scheme, including the River Derwent SAC (and SSSI), Lower Derwent Valley SAC, SPA & Ramsar, Strensall Common SPA (and SSSI) and the North York Moors SPA and SAC. Of these, the Lower Derwent Valley SPA (and SSSI; ~600m) and Strensall Common SAC (and SSSI; ~300m), and are within close proximity to the proposed pipeline. At its closest point, new infrastructure proposed at the WTW will be 60m from the boundaries of the River Derwent SAC and Lower Derwent Valley SPA and within 1km from Lower Derwent Valley SAC & Ramsar (Unit 2 of the underpinning SSSI - Newton Mask SSSI). During construction there is a risk of noise/visual disturbance displacing qualifying species present. There is also a risk of pollution incidents (fuel, oil) while using construction vehicles that could leach into adjacent supporting habitat and the River Derwent itself. In addition, proposed construction works will be adjacent to coastal and floodplain grazing marsh priority habitat, which is likely to act as supporting/ functionally linked habitat. Exposure to increased air pollution (nitrogen deposition and dust) has also been identified as an impact pathway. The HRA screening has concluded likely significant effects on these sites prior to mitigation. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. The HRA has also considered the Teesmouth and Cleveland Coast SPA and Teesmouth and Cleveland Coast Ramsar site which are in hydrological connectivity to the River Tees and has concluded no likely significant effects on the designated features of these sites. There is one additional SSSI within 1km of the construction zone. There are 16 areas of ancient woodland within 1km of the scheme, of which five are in close proximity (~100m). In addition, one LNR is within 1km of the scheme. Construction of the pipeline may also have adverse effects towards a limited number of priority habitat areas, which would be intersected, including Good quality semi-improved grassland habitats. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise these impacts. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning (e.g. use of trenchless technology/tunnelling).	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme due to partial treatment to remove INNS prior to transfer.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 957 biodiversity units would be lost during construction of the new works and pipeline (under a worst case scenario). For areas of habitat affected by construction, for example, along the 85km of pipeline, this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement, in particular grassland and woodland habitat local to the scheme.	Large	Moderate	Long-term	Permanent	Medium	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	For the majority of its length (~62km), the proposed pipeline passes through agricultural land, in addition to woodlands and grassland. However there are areas where the pipeline construction work would come in proximity to a number of residential areas including Elvington, Stockton-on-the-Forest, Haxby, Strensall, Sutton-on the-Forest, Stillington, Hushwaite, Bagby, Knayton, Borrowby, Hurworth-on-Tees, Neasham and Darlington. Scheme construction has the potential for some temporary adverse effects, such as nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. The scheme would deliver 50 Ml/d, helping to maintain essential public water supplies and therefore help maintain public health and well-being.	Large	Moderate (adverse) High (beneficial)	Long-term	Temporary (adverse) Permanent (beneficial)	Medium (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Moderate adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Given the scale of the scheme pipeline construction, construction activity will have a temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities, such as playing fields, golf courses, sports facilities, play spaces, public paths and rights of way (PRoW). The proposed pipeline intersects the national cycle network at multiple points. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. Operation of the scheme is not anticipated to have any adverse impacts towards access to publicly available recreational facilities.	Large	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme, including a 85km pipeline and booster stations along the route, new duty and standby raw water pumps, new water treatment infrastructure, new pump and upgrades to existing treatment stream. Once operational, further material inputs will be required, such as regular maintenance and additional electricity for pumping.	Large	High	Medium-term	Temporary	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The WFD assessment concluded there is unlikely to be deterioration in water quality in the WFD water body. Approximately 13.5km of the proposed pipeline route intersects source protection zones 2 and 3.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from a WFD water body. The WFD assessment identified that the flow reductions as a result of this option are significant and may impact aquatic habitats, however, low flows would be protected by the existing maintained flow condition within Northumbrian Water's existing licence and additional river regulation (within existing licence) to support abstraction, where required. As a result, there is unlikely to be a deterioration in WFD status associated with the scheme. Further detailed assessment and information on the operating regime of the scheme would be required to provide further certainty regarding the WFD assessment conclusions. Abstraction would be from a waterbody designated as with less than 30% resource availability.	Large	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The proposed pipelines would be located within a small area (~2.2km) of Flood Risk Zone 2 and 3. Temporary mitigation measures may be required to alleviate flood risk. In operation, the pipeline would be below ground and the new above-ground infrastructure would only have a small footprint. Taking into account additional pressures due to climate change, the effects on flood storage are therefore assessed as minor adverse (subject to the findings of any Flood Risk Assessment).	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The scheme pipeline would require temporary land take within a large quantity of greenfield, best and most versatile agricultural land (Agricultural Land Classification Grade 3, 58.5km), and a small quantity of Agricultural Land Classification Grade 2 (3.5km) land, of medium to high value. There are additionally five historic landfill sites within 1km of the proposed pipeline routes, of which one historic landfill site is in close proximity (~100m) to the scheme. During construction of this therefore presents a potential land contamination risk. Overall, the potential effects on soil associated with the construction work (pipeline trenching/tunnelling) are considered temporary and reversible. In operation the pipeline would be buried so would only have temporary effects.	Large	High	Medium-term	Temporary	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust for a limited duration. These will be minimised through best practice construction techniques. There are no AQMAs within 3km of the scheme, however adverse effects are anticipated as a result of construction activity on local air quality in surrounding urban areas to the pipeline route. It is anticipated that the increase in vehicle movements associated with the regular maintenance required at the booster stations and new pumping stations, and chemical deliveries for the new water treatment infrastructure, and upgraded treatment stream are anticipated to be associated with negligible impacts.	Large	High	Medium-term	Temporary	High (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Given the scale of scheme construction activities, a large quantity of carbon emissions are anticipated from HGV movements and construction activities. During operation there would also be a minor increase in energy use associated with further material inputs which will be required, such as regular maintenance and additional electricity for pumping.	Medium	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute 50Ml/d to a secure supply-demand balance over the next 25 years, improving resilience to the threats of climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are 15 scheduled monuments and numerous listed buildings within 1km of the scheme construction, of which two listed buildings are located in close proximity (~100m) to the scheme construction. There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Medium	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	A small area of the proposed pipeline (~6km length) passes within 1km of the Howardian Hills AONB. Indirect adverse effects towards the setting of the AONB due to increased HGV movements during construction of the pipeline would be temporary. However, the pipeline would not be visible once completed.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	**DV7 (v) - Ouse Pipeline Option 1**
Scheme description	This scheme is to transfer 80 Ml/d partially treated water via a new pipeline. This scheme is comprised of the following elements: • Abstraction (80 Ml/d) • New duty and standby raw water pumps in existing housing. • New water treatment infrastructure (for partial treatment) including bankside storage, blending tanks and new pumps to pass flow through treatment stages (including removal of particulates down to 5 micron to enable INNS removal). • New pump at an intake on the Tyne, within existing building. • A new 900mm pipeline 85km, with booster station required along the route. • One booster pumping station and associated infrastructure. • Upgrade to existing treatment stream, to allow additional 50 MLD through the GAC and contact tanks, including blending and holding tanks located within the existing works footprint. • 50 Ml/d available to put into supply and 30 Ml/d available for onward supply.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	There are seven European designated sites within 10km of the scheme, including the River Derwent SAC (and SSSI), Lower Derwent Valley SAC, SPA & Ramsar, Strensall Common SPA (and SSSI) and the North York Moors SPA and SAC. Of these, the Lower Derwent Valley SPA (and SSSI; ~60m) and Strensall Common SAC (and SSSI; ~300m), and are within close proximity to the proposed pipeline. At its closest point, new infrastructure proposed will be 60m from the boundaries of the River Derwent SAC and Lower Derwent Valley SPA and within 1km from Lower Derwent Valley SAC & Ramsar (Unit 2 of the underpinning SSSI - Newton Mask SSSI). During construction, there is a risk of noise/visual disturbance displacing qualifying species present. There is also a risk of pollution incidents (fuel, oil) while using construction vehicles that could leach into adjacent supporting habitat and the River Derwent itself. In addition, proposed construction works will be adjacent to coastal and floodplain grazing marsh priority habitat, which is likely to act as supporting/ functionally linked habitat. Exposure to increased air pollution (nitrogen deposition and dust) has also been identified as an impact pathway. The HRA screening has concluded likely significant effects on these sites prior to mitigation. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. The HRA has also considered the Teesmouth and Cleveland Coast SPA and Teesmouth and Cleveland Coast Ramsar site which are in hydrological connectivity to the River Tees and has concluded no likely significant effects on the designated features of these sites. There is one additional SSSI within 1km of the construction zone. There are 16 areas of ancient woodland within 1km of the scheme, of which five are in close proximity (~100m). In addition, one LNR is within 1km of the scheme. Construction of the pipeline may also have adverse effects towards a limited number of priority habitat areas, which would be intersected, including Good quality semi-improved grassland habitats. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise these impacts. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning (e.g. use of trenchless technology/tunnelling).	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme due to partial treatment to remove INNS prior to transfer.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 988 biodiversity units would be lost during construction of the new works and pipeline (under a worst case scenario). For areas of habitat affected by construction, for example, along the 85km of pipeline, this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement, in particular grassland and woodland habitat local to the scheme.	Large	Moderate	Long-term	Permanent	Medium	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	For the majority of its length (~62km), the proposed pipeline passes through agricultural land, in addition to woodlands and grassland. However, there are areas where the pipeline construction work would come in proximity to a number of residential areas including Elvington, Stockton-on-the-Forest, Haxby, Strensall, Sutton-on the-Forest, Stillington, Hushwaite, Bagby, Knayton, Borrowby, Hurworth-on-Tees, Neasham and Darlington. Scheme construction has the potential for some temporary adverse effects, such as nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. The scheme would deliver 80 Ml/d, helping to maintain essential public water supplies and therefore help maintain public health and well-being.	Large	Moderate (adverse) High (beneficial)	Long-term	Temporary (adverse) Permanent (beneficial)	Medium (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Moderate adverse	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Given the scale of the scheme pipeline construction, construction activity will have a temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities, such as playing fields, golf courses, sports facilities, play spaces, public paths and rights of way (PRoW). The proposed pipeline intersects the national cycle network at multiple points. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. Operation of the scheme is not anticipated to have any adverse impacts towards access to publicly available recreational facilities.	Large	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme, including a 85km pipeline and booster stations along the route, new duty and standby raw water pumps, new water treatment infrastructure, new pump and upgrades to existing treatment stream. Once operational, further material inputs will be required, such as regular maintenance and additional electricity for pumping.	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The WFD assessment concluded there is unlikely to be deterioration in water quality in the WFD water body. Approximately 13.5km of the proposed pipeline route intersects source protection zones 2 and 3.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from a WFD water body. The WFD assessment identified that the flow reductions as a result of this option are significant and may impact aquatic habitats, however, low flows would be protected by the existing maintained flow condition within Northumbrian Water's existing licence and additional river regulation (within existing licence) to support abstraction, where required. As a result, there is unlikely to be a deterioration in WFD status associated with the scheme. Further detailed assessment and information on the operating regime of the scheme would be required to provide further certainty regarding the WFD assessment conclusions. Abstraction would be from a waterbody designated as with less than 30% resource availability.	Large	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The proposed pipelines would be located within a small area (~2.2km) of Flood Risk Zone 2 and 3. Temporary mitigation measures may be required to alleviate flood risk. In operation, the pipeline would be below ground and the new above-ground infrastructure would only have a small footprint. Taking into account additional pressures due to climate change, the effects on flood storage are therefore assessed as minor adverse (subject to the findings of any Flood Risk Assessment).	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The scheme pipeline would require temporary land take within a large quantity of greenfield, best and most versatile agricultural land (Agricultural Land Classification Grade 3, 58.5km), and a small quantity of Agricultural Land Classification Grade 2 (3.5km) land, of medium to high value. There are additionally five historic landfill sites within 1km of the proposed pipeline routes, of which one historic landfill site (Old Brickyard) is in close proximity (~100m) to the scheme. During construction of this therefore presents a potential land contamination risk. Overall, the potential effects on soil associated with the construction work (pipeline trenching/tunnelling) are considered temporary and reversible. In operation the pipeline would be buried so would only have temporary effects.	Large	High	Medium-term	Temporary	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust for a limited duration. These will be minimised through best practice construction techniques. There are no AQMAs within 3km of the scheme, however adverse effects are anticipated as a result of construction activity on local air quality in surrounding urban areas to the pipeline route. It is anticipated that the increase in vehicle movements associated with the regular maintenance required at the booster stations and new pumping stations, and chemical deliveries for the new water treatment infrastructure, and upgraded treatment stream are anticipated to be associated with negligible impacts.	Large	High	Medium-term	Temporary	High (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Given the scale of scheme construction activities, a large quantity of carbon emissions are anticipated from HGV movements and construction activities. During operation there would also be a minor increase in energy use associated with further material inputs which will be required, such as regular maintenance and additional electricity for pumping.	Medium	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute 80Ml/d to a secure supply-demand balance over the next 25 years, improving resilience to the threats of climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are 15 scheduled monuments and numerous listed buildings within 1km of the scheme construction, of which two listed buildings are located in close proximity (~100m) to the scheme construction. There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Medium	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	A small area of the proposed pipeline (~6km length) passes within 1km of the Howardian Hills AONB. Indirect adverse effects towards the setting of the AONB due to increased HGV movements during construction of the pipeline would be temporary. However, the pipeline would not be visible once completed.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	**DV7 (vi) - York Pipeline Option 1**
Scheme description	This scheme is to transfer 140 Ml/d partially treated water via a new pipeline. This scheme is comprised of the following elements: • Abstraction (140 Ml/d) • New duty and standby raw water pumps in existing housing. • New water treatment infrastructure (for partial treatment) including bankside storage, blending tanks and new pumps to pass flow through treatment stages (including removal of particulates down to 5 micron to enable INNS removal). • New pump at intake on the Tyne, within existing building. • A new 1200mm pipeline 85km, with booster station required along the route. • One booster pumping station and associated infrastructure. • Upgrade to existing treatment stream, to allow additional 50 Ml/d through the GAC and contact tanks, including blending and holding tanks located within the existing works footprint. • 50 Ml/d available to put into supply and 80 Ml/d available for onward supply.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	There are seven European designated sites within 10km of the scheme, including the River Derwent SAC (and SSSI), Lower Derwent Valley SAC, SPA & Ramsar, Strensall Common SPA (and SSSI) and the North York Moors SPA and SAC. Of these, the Lower Derwent Valley SPA and SSSI (~60m) and Strensall Common SAC (and SSSI) (~300m), and are within close proximity to the proposed pipeline to Elvington. At its closest point, new infrastructure proposed will be 60m from the boundaries of the River Derwent SAC and Lower Derwent Valley SPA and within 1km from Lower Derwent Valley SAC & Ramsar (Unit 2 of the underpinning SSSI - Newton Mask SSSI). During construction there is a risk of noise/visual disturbance displacing qualifying species present. There is also a risk of pollution incidents (fuel, oil) while using construction vehicles that could leach into adjacent supporting habitat and the River Derwent itself. In addition, proposed construction works will be adjacent to coastal and floodplain grazing marsh priority habitat, which is likely to act as supporting/ functionally linked habitat. Exposure to increased air pollution (nitrogen deposition and dust) has also been identified as an impact pathway. The HRA screening has concluded likely significant effects on these sites prior to mitigation. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. The HRA has also considered the Teesmouth and Cleveland Coast SPA and Teesmouth and Cleveland Coast Ramsar site which are in hydrological connectivity to the River Tees and has concluded no likely significant effects on the designated features of these sites. There is one additional SSSI within 1km of the construction zone. There are 16 areas of ancient woodland within 1km of the scheme, of which five are in close proximity (~100m). In addition, one LNR is within 1km of the scheme. Construction of the pipeline may also have adverse effects towards a limited number of priority habitat areas, which would be intersected, including Good quality semi-improved grassland habitats. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise these impacts. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning (e.g. use of trenchless technology/tunnelling).	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme due to partial treatment to remove INNS prior to transfer.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 988 biodiversity units would be lost during construction of the new works and pipeline (under a worst case scenario). For areas of habitat affected by construction, for example, along the 85km of pipeline, this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement, in particular grassland and woodland habitat local to the scheme.	Large	Moderate	Long-term	Permanent	Medium	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	For the majority of its length (~62km), the proposed pipeline passes through agricultural land, in addition to woodlands and grassland. However there are areas where the pipeline construction work would come in proximity to a number of residential areas including Elvington, Stockton-on-the-Forest, Haxby, Strensall, Sutton-on the-Forest, Stillington, Hushwaite, Bagby, Knayton, Borrowby, Hurworth-on-Tees, Neasham and Darlington. Scheme construction has the potential for some temporary adverse effects, such as nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. The scheme would deliver 80 Ml/d, helping to maintain essential public water supplies and therefore help maintain public health and well-being.	Large	Moderate (adverse) High (beneficial)	Long-term	Temporary (adverse) Permanent (beneficial)	Medium (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Moderate adverse	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Given the scale of the scheme pipeline construction, construction activity will have a temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities, such as playing fields, golf courses, sports facilities, play spaces, public paths and rights of way (PRoW). The proposed pipeline intersects the national cycle network at multiple points. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. Operation of the scheme is not anticipated to have any adverse impacts towards access to publicly available recreational facilities.	Large	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme, including a 85km pipeline and booster stations along the route, new duty and standby raw water pumps, new water treatment infrastructure, new pump and upgrades to existing treatment stream. Once operational, further material inputs will be required, such as regular maintenance and additional electricity for pumping.	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The WFD assessment concluded there is unlikely to be deterioration in water quality in the WFD water body. Approximately 13.5km of the proposed pipeline route intersects source protection zones 2 and 3.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from a WFD water body. The flow reductions as a result of this option are significant and may impact aquatic habitats, however, low flows would be protected by the existing maintained flow condition within Northumbrian Water's existing licence and additional river regulation (within existing licence) to support abstraction, where required. Despite this, this option could reduce many of the moderate flows to the maintained flow condition which would potentially lead to deterioration in the biological status elements. Further detailed assessment and information on the operating regime of the scheme would be required to provide further certainty regarding the WFD assessment conclusions. Abstraction would be from a waterbody designated as with less than 30% resource availability.	Large	Low	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The proposed pipelines would be located within a small area (~2.2km) of Flood Risk Zone 2 and 3. Temporary mitigation measures may be required to alleviate flood risk. In operation, the pipeline would be below ground and the new above-ground infrastructure would only have a small footprint. Taking into account additional pressures due to climate change, the effects on flood storage are therefore assessed as minor adverse (subject to the findings of any Flood Risk Assessment).	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The scheme pipeline would require temporary land take within a large quantity of greenfield, best and most versatile agricultural land (Agricultural Land Classification Grade 3, 58.5km), and a small quantity of Agricultural Land Classification Grade 2 (3.5km) land, of medium to high value. There are additionally five historic landfill sites within 1km of the proposed pipeline routes, of which one historic landfill site is in close proximity (~100m) to the scheme. During construction of this therefore presents a potential land contamination risk. Overall, the potential effects on soil associated with the construction work (pipeline trenching/tunnelling) are considered temporary and reversible. In operation the pipeline would be buried so would only have temporary effects.	Large	High	Medium-term	Temporary	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust for a limited duration. These will be minimised through best practice construction techniques. There are no AQMAs within 3km of the scheme, however adverse effects are anticipated as a result of construction activity on local air quality in surrounding urban areas to the pipeline route. It is anticipated that the increase in vehicle movements associated with the regular maintenance required at the booster stations and new pumping stations, and chemical deliveries for the new water treatment infrastructure, and upgraded treatment stream are anticipated to be associated with negligible impacts.	Large	High	Medium-term	Temporary	High (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Given the scale of scheme construction activities, a large quantity of carbon emissions are anticipated from HGV movements and construction activities. During operation there would also be a minor increase in energy use associated with further material inputs which will be required, such as regular maintenance and additional electricity for pumping.	Medium	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute 80Ml/d to a secure supply-demand balance over the next 25 years, improving resilience to the threats of climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are 15 scheduled monuments and numerous listed buildings within 1km of the scheme construction, of which two listed buildings are located in close proximity (~100m) to the scheme construction. There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Medium	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	A small area of the proposed pipeline (~6km length) passes within 1km of the Howardian Hills AONB. Indirect adverse effects towards the setting of the AONB due to increased HGV movements during construction of the pipeline would be temporary. However, the pipeline would not be visible once completed.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	**DV8 (iv) - York to South Yorkshire Pipeline**
Scheme description	This scheme is to transfer treated water (50Ml/d) via a pipeline to South Yorkshire. This scheme is comprised of the following elements: • A new 800mm pipeline 72km. • New booster pumps (7) required along the route. • A new 23km 800mm main.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	There are seven International designated sites within 10km of the scheme, including the River Derwent SAC (and SSSI), Lower Derwent Valley SAC, SPA & Ramsar (and Derwent Ings SSSI), Skipwith Common SAC (and SSSI), the Peak District Moors (Phase 1) SPA and South Pennine Moors SAC. Of these, the Lower Derwent Valley SAC, SPA and Ramsar (~90m) and Skipwith Common SAC (~60m), and are within close proximity to the proposed pipeline route. During construction there is a risk of noise/visual disturbance displacing qualifying species present. There is also a risk of pollution incidents (fuel, oil) while using construction vehicles that could leach into adjacent supporting habitat and the River Derwent itself. Exposure to increased air pollution (nitrogen deposition and dust) has also been identified as an impact pathway. The HRA screening has concluded likely significant effects on these sites prior to mitigation. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. Two additional SSSIs are located within 1km of the pipeline route - Forlorn Hope Meadow SSSI and Denaby Ings SSSI. There are further 47 areas of ancient woodland within 1km of the scheme, of which 8 are in close proximity (~100m) and one (Green Lane Spring) would be intersected by the proposed pipeline to Rivelin. In addition, there are five LNRs and two NNRs within 1km of the scheme, of which one LNR and two NNRs are in close proximity (~100m) to the pipeline. Construction of the pipeline may also have adverse effects on a small number of priority habitat areas adjacent the route, including: Good quality semi-improved grassland, and Lowland Calcareous Grassland habitats. Construction of the pipeline would have temporary adverse effects on the above designated habitats due to the potential for habitat loss and fragmentation as a result of construction works. Construction would also generate indirect effects through dust emissions and noise disturbance. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise these impacts. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning (e.g. use of trenchless technology/tunnelling).	Large	Moderate	Medium-term	Temporary	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme as it involves transfer of treated water.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 813 biodiversity units would be lost during construction of the pipeline (under a worst case scenario). For areas of habitat affected by construction, for example, along the 95km of pipeline, this will provide major beneficial opportunities for compensatory planting and habitat enhancement, in particular grassland and woodland habitat in the Dearne Valley Green Heart Nature Improvement Area (NIA).	Large	Moderate	Long-term	Permanent	Medium	High	None	Major beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	For the majority of its length, the proposed pipeline routes run through agricultural land, woodlands and grassland. However there are areas where the pipeline construction work would come in proximity to a number of residential areas including Conisbrough, Selby, Mexborough, Swinton, Rawmarsh, Elvington, Wharncliffe Side, High Green, Wentworth and Harley. Scheme construction has the potential for some temporary adverse effects, such as nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils.	Large (adverse) Large (beneficial)	Moderate (adverse) High (beneficial)	Long-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Moderate adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Given the scale of the scheme pipeline construction, construction activity will have a moderate, temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities such as allotments or growing spaces, play spaces, public parks, golf courses, sports facilities, public paths and rights of way (PRoW). The proposed pipelines intersect the national cycle network at multiple points. These effects will be mitigated as far as possible, such as by footpath and cycleway diversions and liaison between Yorkshire Water, local councils and the Highways Agency. The proposed pipelineintersects three areas which are highly deprived and may therefore affect access to recreational resources for users living within these deprived areas. Operation of the scheme is not anticipated to have any adverse impacts towards access to publicly available recreational facilities.	Large	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme (two new pipelines of total length 95km). Once operational, further material inputs will be required for regular maintenance activities and for pumping.	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Approximately 10km of the proposed pipeline route intersects a source protection zone 3. Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option.	Large	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option involves the transfer of treated water with no link to raw water source/abstraction. Therefore, there are no risks to WFD compliance associated with the operation of this option.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The proposed pipelines would be located within approximately 21km of Flood Risk Zone 2 and 3. Temporary mitigation measures may be required to alleviate flood risk. In operation, the pipeline would be below ground and the new booster pumps (7) would only have a small footprint above ground. Taking into account additional pressures due to climate change, the effects on flood storage are therefore assessed as moderate (subject to the findings of any Flood Risk Assessment).	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The scheme pipelines would require temporary land take within a large quantity of greenfield, best and most versatile agricultural land (Agricultural Land Classification Grade 3), and a small quantity of Agricultural Land Classification Grade 1 and Agricultural Land Classification Grade 2 land, of medium to high value. There are additionally 73 historic landfill sites and 14 permitted waste sites within 1km of the proposed pipeline routes, of which 13 historic landfill sites are in close proximity (~100m) to the scheme and one permitted waste site is in close proximity (~100m) to the pipeline. During construction of this therefore presents a potential land contamination risk. Overall, the potential effects on soil associated with the construction work (pipeline trenching/tunnelling) are considered temporary and reversible. As such, the adverse effects as a result of construction activity on land-use would be major. In operation the pipeline would be buried so would only have temporary effects.	Large	High	Medium-term	Temporary	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust for a limited duration. These will be minimised through best practice construction techniques. The proposed pipeline intersects one AQMA (Sheffield City-wide AQMA, ~10.5km). As such, the adverse effects as a result of construction activity towards local air quality within the above AQMAs are anticipated. Vehicle movements associated with the regular maintenance required for the pipeline and booster stations would be negligible.	Medium	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Given the scale of scheme construction activities (new 95km pipeline and booster stations), a large quantity of carbon emissions are anticipated from HGV movements and construction activities. During operation there would also be a minor increase in energy use associated with further material inputs which will be required, such as regular maintenance and additional electricity for pumping.	Medium	High	Medium-term	Temporary	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	Without a scheme to pair with this option - it will not improve resilience to climate change	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are three registered park and gardens, 20 scheduled monuments and numerous listed buildings within 1 km of the scheme construction, of which four scheduled monuments and 10 listed buildings (Grade II) are located in close proximity (~100m) to the scheme construction. There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Large	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	A small area of the proposed pipeline (~800m length) intersects the Peak District National Park to the west of Sheffield. Adverse effects towards the setting of the national park due to increased HGV movements during construction of the pipeline would be temporary. However, the pipeline would not be visible once completed.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	**DV8 (v) - York WTW Capacity increase**
Scheme description	This scheme is to increase treatment capacity at an existing WTW by 50 Ml/d. This scheme is comprised of the following elements: • A new standalone/separate treatment stream at the WTW designed to solely treat 50 Ml/d of water from the River Ouse. INNS treatment would also be required. The additional structure, pipework and reservoir would occupy land adjacent the existing works, increasing the overall footprint of the WTW.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	There are four International designated sites within 10km of the scheme, including the River Derwent SAC (and SSSI) and Lower Derwent Valley SAC, SPA & Ramsar (and Newton Mask SSSI). The River Derwent SAC (and SSSI) and the Lower Derwent Valley SAC, and SPA are within close proximity to the proposed new treatment facilities and the Lower Derwent Valley Ramsar is 1km distant. During construction there is a risk of noise/visual disturbance displacing qualifying species present. There is also a risk of pollution incidents (fuel, oil) while using construction vehicles that could leach into adjacent supporting habitat and the River Derwent itself. Exposure to increased air pollution (nitrogen deposition and dust) has also been identified as an impact pathway. The HRA screening has concluded likely significant effects on these sites prior to mitigation. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. The construction of the new standalone/separate treatment stream may also have adverse effects towards priority habitat areas located to the north and south of the existing WTW site, including: Coastal and Floodplain Grazing Marsh habitats. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise these impacts. Consultation with Natural England regarding detailed design and mitigation for impacts on the designated sites and priority habitat areas would be required during project planning.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in only small decreases in the natural capital assets.	Small	Moderate	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new standalone/separate treatment stream at Elvington through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste.	Small	Moderate	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 32 biodiversity units would be lost during construction of the new treatment facility at the WTW (under a worst case scenario). For areas of habitat affected by construction this will provide minor beneficial opportunities for compensatory planting and habitat enhancement, in particular grassland habitat in the local area.	Small	Low	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The proposed new standalone/separate treatment stream would be constructed adjacent to the existing WTW site. The existing site is surrounded by non-designated grassland and farmland. Scheme construction has the potential for some temporary adverse effects, such as nuisance from noise, dust and vibration, towards residents in the nearby Elvington urban area. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. The scheme would deliver 50 Ml/d helping to maintain essential public water supplies and therefore help maintain public health and well-being.	Small (adverse) Large (beneficial)	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Given the scale of the scheme construction (new standalone/separate treatment stream), construction activity will have a minor, temporary adverse impact on informal recreation due to temporary disruption to recreational activities associated with the River Derwent, including public paths and rights of way (PRoW). These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. Operation of the scheme is not anticipated to have any adverse impacts towards recreational activities associated with the River Derwent and the water environment for other users.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme (new standalone/separate treatment stream). Once operational, further material inputs will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option.	Small	Low	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The River Derwent is designated with greater than 30% resource availability. This scheme would not involve abstraction from a waterbody and is not anticipated to impact on surface water levels and flows in the River Derwent. There are no risks to WFD compliance associated with the operation of this option.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The new standalone/separate treatment stream would be constructed adjacent to the existing WTW site and would not be located within an area of existing flood risk. The land adjacent to the existing WTW site is however in close proximity to Flood Risk Zones 2 and 3 of the River Derwent (floodplain grazing marshes), which runs adjacent to the WTW. Temporary mitigation measures may be required to alleviate flood risk. In operation, the new standalone/separate treatment stream would only have a small additional footprint above ground. Taking into account additional pressures due to climate change, the effects on flood storage are assessed as negligible (subject to the findings of any Flood Risk Assessment).	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The scheme pipeline would require temporary land take of a small quantity of greenfield, best and most versatile agricultural land (Agricultural Land Classification Grade 3), of medium value. Overall, the potential effects on soil associated with the construction work are considered temporary and reversible. In operation the new standalone/separate treatment stream would only have a small footprint above ground.	Small	High	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust for a limited duration at an existing WTW. These will be minimised through best practice construction techniques. There are no AQMAs within 1km of the scheme. It is anticipated that the increase in vehicle movements associated with the increased operations at the new standalone additional treatment infrastructure would be minor.	Small	High	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Given the scale of scheme construction activities (new standalone/separate treatment stream), a small quantity of carbon emissions are anticipated from HGV movements and construction activities. During operation there would also be a minor increase in energy use associated with further material inputs which will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute 50Ml/d to a secure supply-demand balance over the next 25 years, improving resilience to the threats of climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are two scheduled monuments and 11 listed buildings within 1 km of the scheme construction, one of which (Grade II* listed building) is in close proximity to the land adjacent to the south of the existing WTW site. There is potential for indirect adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are no designated landscapes within 1km of the scheme. In operation the new standalone/separate treatment stream would have a small footprint above ground at an existing WTW.	Medium	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial

Scheme name	E2 - Yorkshire Water export to Severn Trent Water
Scheme description	This scheme is to provide treated water (20Ml/d, peak 25Mld) to Severn Trent Water from the Yorkshire Water grid network. This scheme is comprised of the following elements: • A new 17.4km 450mm pipeline from an existing Yorkshire Water service reservoir to an existing Yorkshire Water service reservoir. • A new 30Ml treated service reservoir adjacent to an existing Yorkshire Water service reservoir to be supplied by an exisiting WTW. • A new 9.2km pipeline to an existing Severn Trent Water reservoir. • The new 9.2km pipeline consists of a 6.2km 600mm gravity section to a new booster station (with duty, assist and standby treated water pumps), with the remaining 3.2km pumped at 450mm.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA has not identified any International designated sites within 10km of the proposed scheme. The South Pennine Moors SAC and Peak District Moors (South Pennine Moors) Phase 1 SPA are located 13km west of the proposed pipeline route. No likely significant effects have been identified. The pipeline route runs adjacent to an area of priority habitat Coastal and Floodplain Grazing Marsh. Consultation with Natural England regarding detailed design and mitigation would be required during project planning to ensure impacts on this habitat are avoided. There is one SSSI and three Local Nature Reserves within 1km of the scheme. There are also over 20 areas of Ancient Woodland within 1km. However, provided best construction practice is followed, none of these sites are within close enough proximity to the construction to result in negative effects. The operation of the scheme is not anticipated to result in any significant adverse effects.	Small	Moderate	Medium-term	Temporary	Low	Medium	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	There are no sites designated for their natural capital value within proximity of the scheme. The construction of the scheme would result in local-scale decreases in natural capital in areas close to the construction, by impacting tranquillity and biodiversity. These will be small-scale and temporary. No significant benefits are anticipated.	Small	Low	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of spreading terrestrial INNS through construction activities. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. Operation of the scheme is not expected to introduce or spread INNS.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 154 biodiversity units would be lost during construction of the; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement.	Small	Low	Long-term	Permanent	Medium (beneficial) Low (adverse)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The construction phase of the scheme may result in noise, dust and vibration impacts. The construction will be a largely residential area, and therefore is anticipated to cause negative effects for large numbers of people. The construction is likely to impact some roads; which may cause delays and impact upon community wellbeing. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through the local authority. The scheme would deliver 20-25Ml/d, helping to maintain essential public water supplies and therefore help maintain public health and well-being. Construction may result in a small increase in local employment levels, aiding the local economy.	Small	Moderate (adverse) High (beneficial)	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium	Medium	Moderate adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction would be within 1500m of Rother Valley Country Park and Ulley Country Park, sites designated for their recreational value. Access to these Parks would not be directly affected by the construction phase but they may temporarily lose some recreational value due to construction disturbance. The pipeline would also intersect the following strategic routes; Trans-Pennine Trail, which may need to be diverted.	Medium	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help to reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme. Resources for construction of the scheme will be sourced locally where possible. The scheme will make use of existing infrastructure where possible (e.g. connection to existing Grid main).	Small	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. This option involves the transfer of treated water with no link to raw water source/abstraction. Therefore, there are no risks to WFD compliance associated with the operation of this option.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The proposed scheme does not involve abstraction of water from any surface or groundwater waterbodies and as a result there is not anticipated to be any effect, positive or negative, on levels or flows.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During operation the scheme would be entirely subsurface during operation and therefore there would be no change to flood risk. During construction, there will be a number of areas where the pipeline will be constructed within flood zones and pipeline route will require a crossing of the River Rother. Construction best practice should minimise any impact of construction on flood risk.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme would not have direct effects on water efficiency. The scheme does not directly contribute towards improving the awareness of water sustainability and its true value.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	There are no sites designated for their geological interest within proximity of the scheme. The potential effects on soil associated with the construction work (pipeline trenching/tunnelling) are considered temporary and reversible. The pipeline would cross Agricultural Land Classification 3 for a considerable distance. The pipeline would be buried so only temporary effects are anticipated. The pipeline route runs adjacent two historic landfills and would intersect one currently permitted landfill site, although the route would follow an existing road, therefore construction could result in adverse impacts to soil quality. No long-term adverse effects are anticipated on geology, soils or overall land-use management.	Small	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with the construction phase would generate temporary air emissions and dust. These will be minimised through best practice construction techniques. Emissions will take place within Sheffield Citywide AQMA, resulting in a decrease in air quality in this area. Operation of the scheme will not result in emissions to air.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Scheme construction would be associated with GHG emissions from HGV movements and construction activities. Construction work and vehicle movements associated with construction phase will give rise to temporary GHG emissions over the medium term, but these will be minimised through best construction practices. Operation of the scheme will not be associated with GHG emissions.	Small	High	Medium-term	temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scale of this scheme would make a moderate contribution to securing a resilient water supply in the longer term to help meet the challenges of climate change impact on water supply reliability.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The pipeline would be in close proximity (<1km) to two scheduled monuments approximately 10 Listed Buildings and three conservation areas. None of these designations are anticipated to be directly affected by the construction, but they may experience impacts to their setting during the construction phase.	Small	Low	Medium-term	temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme construction will not be visible from any statutory designated landscape site (national park, AONB). A proportion of the site will be within the South and West Yorkshire Greenbelt, the openness of which will be impacted during construction. Construction will be relatively small scale and therefore only minor negative effects are anticipated. All new infrastructure will be buried, therefore there are no effects anticipated during operation.	Small	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R1a River Ouse water treatment works extension**
Scheme description	This scheme involves the construction of additional water treatment capacity at a WTW to enable Yorkshire Water to abstract water from the River Ouse up to the limit of the abstraction licence, by constructing a mirror image of the existing 35Ml/d works. It is estimated the combined output of the two works would be up to 70Ml/d. Despite the additional works being no bigger than the existing works, efficiencies due to interconnecting the two works is expected to provide an increased maximum output. The licence allows for abstraction of 96Ml/d average and 130Ml/d peak. This scheme enables an additional 22Ml/d yield (average) – with an additional 25Ml/d (average) abstracted and 3Ml/d returned as WTW wash water. The scheme includes a new intake and raw water pumping station would be constructed, as well as the main treatment plant, contact tanks and treated water storage capacity. The implementation period of the option is anticipated to be 3 years.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA screening was conducted to assess possible impacts of the scheme on a local SAC which is supported by 2 waterbodies. The site is not hydrologically linked to the proposed scheme. The designated site is situated in hydrological connectivity with the waterbodies, with the confluence of these watercourses and the River Ouse located downstream of the proposed abstraction intake. These watercourses are therefore unaffected by the proposed abstraction. The proposed pipeline and infrastructure required to support the scheme are sufficiently distanced from the SAC for direct and in-direct impacts to be negligible and therefore unlikely to affect qualifying features. The infrastructure will also be outside the Impact Risk Zone (IRZ) for the SAC. Effects on another SAC, SPA and Ramsar were also considered during HRA screening. Overall the HRA concluded that it was unlikely that there would be any likely significant effects, however there is uncertainty with regards to the existence or extent of risks of a likely significant effect on the sea lamprey feature. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. There are two LNRs in proximity to the scheme. Both of these are not dependent on flows in the River Ouse: therefore no adverse impacts are anticipated. There are two water-dependent SSSIs downstream of the abstraction point but these are unlikely to be adversely impacted as the sites are primarily reliant on flood flows which will not be impacted by the scheme. Effects will be mitigated as far as possible by best practice construction methods and undertaken at an appropriate time of year where necessary to protect habitats and ecology (e.g. avoidance of any piling activity at night time).	Medium	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing surface water flows. However, the abstraction will be within existing licence limits and no major water-dependent features are likely to be affected by the abstraction.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Invasive species (Japanese knotweed, giant hogweed & Himalayan balsam) are known to be present in the areas that would undergo construction. There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between sites or catchments.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 0.31 biodiversity units would be lost during construction of the increased capacity at the WTW; this will provide negligible beneficial opportunities for compensatory planting and habitat enhancement.	Small	Low	Long-term	Permanent	Low	Low	None	Negligible beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	All construction and works associated with the scheme would take place within the boundary of an existing WTW. The construction phase will likely lead to increased HGV movements on local roads. However, it is anticipated that impacts on human health from noise, dust and vibration during the construction phase will be minor, assuming best practice methods are used. The scheme would contribute to water supply reliability (deployable output of 22Ml/d), ensuring a resilient supply for customers and economic activity. An increase of 22Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Medium	Moderate	Long-term	Permanent	Low (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	There are angling activities present in the River Ouse, however, the minor flow reduction (within existing licence conditions) in the watercourse is not anticipated to have a significant impact on the quality of the angling. During operation the scheme will not affect access to greenspace and will have no bearing on recreation.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. However, the scheme will increase the proportion of recycled treated surface water returned as WTW wash water. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (including new WTW, river intake and pumping station). Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for treatment chemicals and power for pumping.	Medium	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Short-term construction impacts should be mitigated by best practice methods to prevent pollution of the River Ouse. The scheme is unlikely to affect water quality in the long term. The abstraction would be from the River Ouse. There is no risk of deterioration in WFD status associated with this scheme. Increased abstraction at low flows will be well within existing abstraction licence limits and will have a negligible adverse effect on dilution capacity for the two sewage treatment works downstream of the intake.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction will be within existing abstraction licence limits. Water availability is at least 50% in the zone of influence of the scheme. The hydrological impact on low flows downstream of the abstraction would be minor adverse.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The WTW site is within a Flood Zone 2, but it is protected by a site-specific flood defence. The additional construction required for this scheme may have a minor adverse effect on flood storage dependent on the final design of the new assets. Compensation may be required to negate the effects of construction on the flood plain dependent on the conclusions of any Flood Risk Assessment. The additional abstraction will have a negligible effect on flood flows.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme would not have direct effects on water efficiency, and is not likely to increase awareness of water sustainability, or reduce per capita consumption.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction groundworks will be constrained to a small footprint and are anticipated to have a negligible adverse impact on soil quality. No adverse effects are anticipated on geology or overall land-use management. The scheme is located within an existing brownfield site, and makes efficient use of existing land. Therefore there will not be any opportunities for the restoration of land-based habitats.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with the construction phase will give rise to emissions and dust over the short term. These will be minimised through construction best practice methods. Part of the construction work will be within proximity to an AQMA. However, the temporary level of increase in air emissions associated with the scheme is not considered likely to have greater than a minor impact on the AQMA. Operation of the new WTW and pumping station associated with the scheme will give rise to air emissions at a local scale.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Operation of the new WTW and pumping station associated with the scheme will require additional annual energy consumption associated with increased pumping and water treatment chemical use, with minor adverse impact on greenhouse gas emissions.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute 22Ml/d to a secure supply-demand balance over the next 25 years, improving resilience to the threats of climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are no known historical assets in proximity to the scheme (the site is located north of an Area of Archaeological Importance). Construction of the scheme will involve excavation which could affect unknown buried assets (although no impacts were recorded during extension works at the site previously). This would be further evaluated by desk studies and other investigations prior to construction. The site has been used for a water treatment works for over a century. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown assets if required. Operation of the scheme will not influence the hydrological setting of any water-dependent assets (assuming the pipeline construction does not intercept groundwater flows), nor will it permanently influence any other aspect of heritage assets or landscapes.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are no designated landscapes associated with the scheme. The site has been used as a WTW for over a century . During construction, the scheme will present a minor temporary impact on visual amenity in the locality.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R1c Grid network enhancement: New River Ouse WTW to York**
Scheme description	This scheme would involve a new abstraction of up to 60Ml/d from the River Ouse under the existing licence with transfer and treatment at a new WTW. The treated water would be available for onward transfer under additional schemes. The scheme is comprised of the following elements: • A new WTW (60Ml/d capacity) and two 90Ml storage lagoons. • A new pipeline to the new works. • A new pumping station (duty and stand by pumps) at the existing site.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA Screening was carried out for two SACs and a Ramsar . As the pipeline would cross the River Ouse, which is hydrologically connected to these sites, construction-phase impacts prior to mitigation cannot be ruled out. The SAC sites are also supported by off-site habitats. The land on which the new WTW is proposed could be considered functionally supportive habitat for these sites. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. HRA screening was conducted to assess possible impacts of the scheme on an SAC which is supported by two waterbodies. The site is not hydrologically linked to the proposed scheme. The designated site is situated in hydrological connectivity withtwo waterbodies, with the confluence of these watercourses and the River Ouse located downstream of the proposed abstraction intake. These watercourses are therefore unaffected by the proposed abstraction. The proposed pipeline and infrastructure required to support the scheme are sufficiently distanced from the SAC for direct and in-direct impacts to be negligible and therefore unlikely to affect qualifying features. The infrastructure will also be outside the Impact Risk Zone (IRZ) for the SAC. Effects on the Humber Estuary SAC (UK0030170), Humber Estuary SPA (UK9006111) and Humber Estuary Ramsar (UK11031) were also considered during HRA screening. Overall the HRA concluded that it was unlikely that there would be any likely significant effects as a result of the operation of the scheme, however there is uncertainty with regards to the existence or extent of risks of a likely significant effect on the Humber Estuary sea lamprey feature. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. Clifton Ings and Rawcliffe Meadows SSSI is within 50m of the proposed pipeline route and may experience adverse effects during the construction phase. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise these impacts. There are two water-dependent SSSIs downstream of the abstraction point (Fulford Ings and Naburn Marsh) but these are unlikely to be adversely impacted as the sites are primarily reliant on flood flows which will not be impacted by the scheme. Effects will be mitigated as far as possible by best practice construction methods and undertaken at an appropriate time of year where necessary to protect habitats and ecology (e.g. avoidance of any piling activity at night time). Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning.	Large	Low	Long-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing surface water flows. However, the abstraction will be within existing licence limits and no major water-dependent features are likely to be affected by the abstraction.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Invasive species (Japanese knotweed, giant hogweed & Himalayan balsam) are known to be present in the areas that would undergo construction. There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between sites or catchments.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 296 biodiversity units would be lost during construction of the intake, pumping station, pipeline and WTW; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Scheme construction may have moderate, short-term adverse impact on residents located in north York near to the pipeline route and WTW due to nuisance from noise, dust and vibration. These effects will be mitigated by best practice construction methods. An increase of up to 60 Ml/d in deployable output will help to maintain the supply-demand balance, reinforcing the supply system, and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable resulting in a moderate beneficial effect.	Medium (adverse) Small (beneficial)	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Moderate adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	During construction, access to areas used for recreation will not be reduced, but the quality of some of these assets may be temporarily lowered, two sites, which are both within 100m of the pipeline construction. In one area the pipeline construction will intersect a National Cycle Route. Suitable diversions will be put in place. Construction and operation of the scheme will not affect access to water-related recreation.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (new pipeline, pumping, storage and treatment infrastructure). As such, the magnitude of effect is medium. Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Short-term construction impacts should be mitigated by best practice methods to prevent pollution of the River Ouse. The scheme is unlikely to affect water quality in the long term. The abstraction would be from the Ouse. There is no risk of deterioration in WFD status associated with this scheme. Increased abstraction at low flows will be well within existing abstraction licence limits and will have a negligible adverse effect on dilution capacity for the two sewage treatment works downstream of the intake.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The WFD assessment identified that effects will be limited to ~10% change under low flow conditions (Q95 flows) and a smaller magnitude under medium and high flows. The hydrological impact on low flows downstream of the abstraction would be minor adverse.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The pipeline construction would be within Flood Zones 2 and 3 and therefore may require temporary mitigation measures. During operation it will be buried and therefore there will be no impact on flood risk. The proposed WTW infrastructure is not within Flood Zones 2 or 3	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The scheme would not affect any sites designated for geological interest. The potential effects on soil associated with the construction work (pipeline trenching/tunnelling) are considered medium scale, temporary and reversible. The scheme would predominantly lie on Agricultural Land Classification Grade 3 land. The WTW works only covers a small land area and the pipeline would be buried so would only have temporary effects. As such, the adverse effects on land-use would be minor.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over the medium term, but these will be minimised through best practice construction techniques. There is a nearby AQMA, and project traffic will be routed away from this area where possible. Operation of the scheme will result in local air emissions from the pumping station and from the new WTW.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in temporary GHG emissions due to activities such as vehicle movements and use of generators. Operation of the scheme will require some additional annual energy consumption associated with increased pumping and water treatment chemical use, with a minor adverse impact on greenhouse gas emissions.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a beneficial contribution (up to 60 Ml/d) to securing a supply-demand balance over the future, taking account of climate change risks and uncertainties. This will help to increase resilience to climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) High (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are a number of heritage assets within 1km. Most will not experience adverse impacts from construction or operation, however, the setting of a Scheduled Monument may be temporarily impacted during construction of the pipeline. Best practice construction methods will be employed to minimise impacts. Construction of the scheme will involve excavation which could affect unknown buried assets. This would be further evaluated by desk studies and other investigations prior to construction. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown assets if required. Operation of the scheme will not influence the hydrological setting of any water-dependent assets (assuming the pipeline construction does not intercept groundwater flows), nor will it permanently influence any other aspect of heritage assets or landscapes.	Small	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Moderate (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The proposed scheme would not be in proximity of any areas nationally designated for their landscape value. Construction of both the pipeline and the WTW would be within Greenbelt, resulting in both temporary and permanent losses of openness in this area.	Small	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	**R1d Grid network enhancement**
Scheme description	This scheme is to transfer treated water from a new WTW via a pipeline to supply reservoir and a pipeline extension to service reservoir (up to 15Ml/d total demand dependant). The new WTW works and related abstraction from the River Ouse would be constructed under another scheme. This scheme is comprised of the following elements: • A new pipeline from WTW to , with two pumping stations (duty and stand by pumps) required along the route. • A new pipeline service reservoir, with two pumping stations (duty and stand by pumps) required along the route.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA Screening was carried out to assess possible impacts of the scheme on three SACs, SPA (UK9006092) and Ramsar (UK11037), and two other SAC and SPA areas. The pipeline route crosses areas of known otter range, which is a qualifying feature of the SAC. The pipeline also crosses watercourses which are hydrologically linked to the designations and passes through known habitat of qualifying bird species. Construction of the pipeline would also be within 3.5km of the SPA and within habitat of the golden plover, meaning there are potential impacts on that qualifying feature. The HRA screening has concluded likely significant effects on these sites prior to mitigation. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. Due to the distance between the proposed scheme and the SAC and the SAC and SPA, no impact pathways from construction of the pipeline have been identified on these sites. Construction of the pipeline will be within 1km of an SSSI and the site may experience adverse effects during the construction phase. The pipeline route runs intersects an area of priority habitat traditional orchard. Consultation with Natural England regarding detailed design and mitigation would be required during project planning to ensure impacts on this habitat are avoided. Effects will be mitigated as far as possible by best practice construction methods and undertaken at an appropriate time of year where necessary to protect habitats and ecology. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning.	Large	Low	Long-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme as it involves transfer of treated water.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 596 biodiversity units would be lost during construction of the pumping stations and pipeline; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Large	High	Long-term	Permanent	Medium	High	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Scheme construction may have minor, short-term adverse impact on residents located in population centres near to the pipeline route due to nuisance from traffic, noise, dust and vibration. These effects will be mitigated by best practice construction methods. An increase of up to 15Ml/d in deployable output will help to maintain the supply-demand balance, reinforcing the supply system, and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable resulting in a moderate beneficial effect.	Medium (adverse) Small (beneficial)	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Moderate (beneficial)	Medium (adverse) High (beneficial)	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction activity will have a minor, temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities such as play spaces, public parks, sports facilities, public paths and rights of way (PRoW). Three National Cycle Routes all run within 1km, and some may require temporary diversion. This will impact upon their value as recreational assets. These effects will be mitigated as far as possible, such as by footpath and cycleway diversions and liaison between Yorkshire Water, local councils and the Highways Agency. Construction and operation of the scheme will not affect access to water-related recreation.	Small	High	Short-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (new pipelines and pumping infrastructure). As such, the magnitude of effect is medium. Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping. The scheme will make use of existing water infrastructure.	Small	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. During operation, this option is the transfer of treated water within a network, so there is no potential pathway for this option to impact any WFD status elements.	Medium	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option involves the transfer of treated water with no link to raw water source/abstraction. Therefore, there are no risks to WFD compliance associated with the operation of this option.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Water	4.3 To reduce and manage flood risk, taking climate change into account.	Approximately 10% of the proposed pipeline route is within Flood Zones 2 and 3, and as a result there is a small potential for adverse impacts upon flooding during construction. During operation the pipeline will be buried, so there will be only a negligible increase in flood risk arising from the presence of two pumping stations in flood zone 3	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pipeline will have a minor negative effect on the quality and quantity of the soils in the area. The construction of pumping stations will require permanent land take of a small scale of land in Agricultural Land Classification Grade 3 land. There are no sites in proximity that are designated for their geological value.	Medium	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over the medium term, but these will be minimised through best practice construction techniques. There are no AQMAs within 1km of the proposed route. Operation of the scheme will result in local air emissions from the pumping stations, although this is anticipated to be negligible.	Small	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in medium-term GHG emissions due to activities such as vehicle movements and use of generators. Operation of the scheme will require some additional annual energy consumption associated with increased pumping, with a minor adverse impact on greenhouse gas emissions.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a beneficial contribution (up to 15Ml/d) to securing a supply-demand balance over the future, taking account of climate change risks and uncertainties. This will help to increase resilience to climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) High (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are a number of sites designated for their heritage value within 1km of the scheme; including Grade 1 Listed Buildings and Scheduled Monuments There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Large	Moderate	Medium-term (adverse)	Temporary	Low (adverse) Low (beneficial)	Moderate (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	Construction of the pipeline and pumping stations would be within 5km of the following designations and therefore may temporarily impact upon their viability as landscape assets; the Yorkshire Dales National Park, the North York Moors National Park, Nidderdale AONB and Howardian Hills AONB. The southernmost 5.5km of the pipeline would be within Greenbelt and therefore construction would temporarily impact upon the openness of this area. However, the pipeline would not be visible once completed.	Large	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R1e Grid network enhancement: New River Ouse WTW to North Yorkshire 2**
Scheme description	This scheme is to transfer treated water from a new WTW via a pipeline a clean water tank (CWT) (up to 5Ml/d). The new WTW works and related abstraction from the River Ouse would be constructed. This scheme is comprised of the following elements: • A new 14.6km pipeline from the WTW to the CWT, with a pumping station (duty and stand by pumps) required along the route.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA Screening was carried out to assess possible impacts of the scheme on , 3 SACs, SPA and Ramsar. The pipeline route crosses areas of known otter range, which is a qualifying feature of the SAC. The pipeline also crosses watercourses which are hydrologically linked to the designations and passes through known habitat of qualifying bird species. The HRA screening has concluded likely significant effects on these sites prior to mitigation. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. Due to the distance between the proposed scheme and the SAC, no impact pathways from construction of the pipeline have been identified on this site. Effects will be mitigated as far as possible by best practice construction methods and undertaken at an appropriate time of year where necessary to protect habitats and ecology. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning.	Large	Low	Long-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme as it involves transfer of treated water.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 26 biodiversity units would be lost during construction of the pumping stations and pipeline; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Large	High	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Scheme construction may have minor, short-term adverse impact on residents located in population centres near to the pipeline route due to nuisance from traffic, noise, dust and vibration. These effects will be mitigated by best practice construction methods. An increase of up to 5Ml/d in deployable output will help to maintain the supply-demand balance, reinforcing the supply system, and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable resulting in a minor beneficial effect.	Medium (adverse) Small (beneficial)	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction activity will have a minor, temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities such as play spaces, public parks, sports facilities, public paths and rights of way (PRoW). The pipeline would intersect a river so would likely impact upon it as a recreational asset temporarily. The pipeline construction would not impact upon any designated recreational assets. These effects will be mitigated as far as possible, such as by footpath and cycleway diversions and liaison between Yorkshire Water, local councils and the Highways Agency.	Small	High	Short-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (new pipelines and pumping infrastructure). Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping. The scheme will make use of existing water infrastructure.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. During operation, this option is the transfer of treated water within a network, so there is no potential pathway for this option to impact any WFD status elements.	Medium	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option involves the transfer of treated water with no link to raw water source/abstraction. Therefore, there are no risks to WFD compliance associated with the operation of this option.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The proposed pipeline route intersect three areas of Flood Zones 2 and 3, and as a result there is a small potential for adverse impacts upon flooding during construction. During operation the pipeline will be buried, so there will be only a negligible increase in flood risk arising from the presence of two pumping stations in flood zone 3	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pipeline will have a minor negative effect on the quality and quantity of the soils in the area. The construction of pumping stations will require permanent land take of a small scale of land in Agricultural Land Classification Grade 3 land. There are no sites in proximity that are designated for their geological value.	Medium	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over the medium term, but these will be minimised through best practice construction techniques. There are no AQMAs within 1km of the proposed route. Operation of the scheme will result in local air emissions from the pumping stations, although this is anticipated to be negligible.	Small	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in medium-term GHG emissions due to activities such as vehicle movements and use of generators. Operation of the scheme will require some additional annual energy consumption associated with increased pumping, with a minor adverse impact on greenhouse gas emissions.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a beneficial contribution (up to 5Ml/d) to securing a supply-demand balance over the future, taking account of climate change risks and uncertainties. This will help to increase resilience to climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) High (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are a number of sites designated for their heritage value within 1km of the scheme. There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Large	Moderate	Medium-term (adverse)	Temporary	Low (adverse) Low (beneficial)	Moderate (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	Construction of the pipeline and pumping station would be within 5km of the an AONB. The southernmost 5.5km of the pipeline would be within the York Greenbelt and therefore construction would temporarily impact upon the openness of this area. However, the pipeline would not be visible once completed.	Large	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	R1f Grid network enhancement: New River Ouse WTW to North Yorkshire 3
Scheme description	This scheme is to transfer treated water from a new WTW via a pipeline to a clean water tank (CWT) (up to 10Ml/d). The new WTW works and related abstraction from the River Ouse would be constructed This scheme is comprised of the following elements: • A new pipeline, with two pumping stations (duty and stand by pumps) required along the route.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA Screening was carried out to assess possible impacts of the scheme on three SACs, SPA and Ramsar, and an SAC and SPA. The pipeline route crosses areas of known otter range, which is a qualifying feature of the SAC. The pipeline also crosses watercourses which are hydrologically linked to the Lower Derwent Valley designations and passes through known habitat of qualifying bird species. The HRA screening has concluded likely significant effects on these sites prior to mitigation. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. Due to the distance between the proposed scheme and the SAC and the SAC and SPA, no impact pathways from construction of the pipeline have been identified on these sites. The pipeline route runs intersects an area of priority habitat coastal floodplain grazing marsh. Consultation with Natural England regarding detailed design and mitigation would be required during project planning to ensure impacts on this habitat are avoided. The pipeline route currently also encroaches on 0.035ha of priority habitat lowland fens. It is assumed that scheme development at the detailed design stage will ensure rerouting to avoid loss of and impacts on this habitat. The pipeline would pass in close proximity to two SSSIs, and therefore construction activity has the potential to impact upon the qualifying features of these sites. Effects will be mitigated as far as possible by best practice construction methods and undertaken at an appropriate time of year where necessary to protect habitats and ecology. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning.	Large	Low	Long-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme as it involves transfer of treated water.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 268 biodiversity units would be lost during construction of the pumping stations and pipeline; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Large	High	Long-term	Permanent	Medium	High	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Scheme construction may have minor, short-term adverse impact on residents located in population centres near to the pipeline route due to nuisance from traffic, noise, dust and vibration. These effects will be mitigated by best practice construction methods. An increase of up to 10 Ml/d in deployable output will help to maintain the supply-demand balance, reinforcing the supply system, and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable resulting in a minor beneficial effect.	Medium (adverse) Small (beneficial)	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction activity will have a minor, temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities such as play spaces, public parks, sports facilities, public paths and rights of way (PRoW). The pipeline construction would also intersect National Cycle Routes, and some may require temporary diversion. This will impact upon their value as recreational assets. These effects will be mitigated as far as possible, such as by footpath and cycleway diversions and liaison between Yorkshire Water, local councils and the Highways Agency. Pipeline construction would intersect three rivers, amongst others. Access to these rivers as recreational assets are likely to be impacted in the short term.	Small	High	Short-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (new pipelines and pumping infrastructure). As such, the magnitude of effect is medium. Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping. The scheme will make use of existing water infrastructure.	Small	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. During operation, this option is the transfer of treated water within a network, so there is no potential pathway for this option to impact any WFD status elements.	Medium	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option involves the transfer of treated water with no link to raw water source/abstraction. Therefore, there are no risks to WFD compliance associated with the operation of this option.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Water	4.3 To reduce and manage flood risk, taking climate change into account.	Sections of the proposed pipeline route is within Flood Zones 2 and 3, and as a result there is a small potential for adverse impacts upon flooding during construction. During operation the pipeline will be buried, so there will be only a negligible increase in flood risk arising from the presence of two pumping stations in Flood zone 3	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pipeline will have a minor negative effect on the quality and quantity of the soils in the area. The construction of pumping stations will require permanent land take of a small scale of land in Agricultural Land Classification Grade 3 land. There are no sites in proximity that are designated for their geological value.	Medium	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over the medium term, but these will be minimised through best practice construction techniques. There are no AQMAs within 1km of the proposed route. Operation of the scheme will result in local air emissions from the pumping stations, although this is anticipated to be negligible.	Small	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in medium-term GHG emissions due to activities such as vehicle movements and use of generators. Operation of the scheme will require some additional annual energy consumption associated with increased pumping, with a minor adverse impact on greenhouse gas emissions.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a beneficial contribution (up to 10Ml/d) to securing a supply-demand balance over the future, taking account of climate change risks and uncertainties. This will help to increase resilience to climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Pipeline construction would directly intersect a Grade II Listed Structure; consideration during detailed design would be required to avoid significant impacts on this asset. Construction would also be in close proximity to numerous other designated sites. There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Medium	Low	Medium-term (adverse)	Temporary	Low (adverse) Low (beneficial)	Moderate (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	Construction of the pipeline and pumping stations would be within 5km of the two AONBs. The settings of these designations may be impacted temporarily. Construction of the pipeline will intersect Greenbelt, temporarily impacting upon the openness of these designations. No impacts are anticipated during operation. However, the pipeline would not be visible once completed.	Large	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R1g Grid network enhancement: New River Ouse WTW to York**
Scheme description	This scheme is to transfer treated water from a new WTW via a pipeline to a service reservoir (SRE) (up to 30Ml/d) for supply. The new WTW works and related abstraction from the River Ouse would be constructed. This scheme is comprised of the following elements: • A new pipeline from the WTW to SRE • New duty and standby pumps at the WTW.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA Screening was carried out to assess possible impacts of the scheme on three SACs, an SPA and Ramsar. The pipeline route does not impact on functionally linked habitat and due to the distance between the proposed scheme, no impact pathways from construction of the pipeline have been identified on these sites. There is one LNR within 1km. Effects will be mitigated as far as possible by best practice construction methods and undertaken at an appropriate time of year where necessary to protect habitats and ecology.	Large	Low	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in decreases in the natural capital assets and would be associated with potential short term impacts to biodiversity and climate regulation, but these effects would be temporary. Potential short term impacts to recreation and wellbeing if construction causes loss of access to recreation sites within the zone of influence.	Large	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities of the new pipeline through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. No operational risks of spread of aquatic INNS are associated with the scheme as it involves transfer of treated water.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 60 biodiversity units would be lost during construction of the pipeline; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Large	High	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Scheme construction may have minor, short-term adverse impact on residents located in population centres near to the pipeline route due to nuisance from traffic, noise, dust and vibration. These effects will be mitigated by best practice construction methods. An increase of up to 30Ml/d in deployable output will help to maintain the supply-demand balance, reinforcing the supply system, and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable resulting in a moderate beneficial effect.	Medium (adverse) Small (beneficial)	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Moderate (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction activity will have a minor, temporary adverse impact on informal recreation due to temporary disruption to a range of recreational facilities such as play spaces, public parks, sports facilities, public paths and rights of way (PRoW). The pipeline would intersect a National Cycle Route so would likely impact upon it as a recreational asset temporarily. These effects will be mitigated as far as possible, such as by footpath and cycleway diversions and liaison between Yorkshire Water, local councils and the Highways Agency.	Small	High	Short-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (new pipelines and pumping infrastructure). Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping. The scheme will make use of existing water infrastructure.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. During operation, this option is the transfer of treated water within a network, so there is no potential pathway for this option to impact any WFD status elements.	Medium	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This option involves the transfer of treated water with no link to raw water source/abstraction. Therefore, there are no risks to WFD compliance associated with the operation of this option.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The proposed pipeline route intersect two areas of Flood Zones 2 and 3, and as a result there is a small potential for adverse impacts upon flooding during construction. During operation the pipeline will be buried, so there will be only a negligible increase in flood risk arising from the presence of two pumping stations in flood zone 3	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pipeline will have a minor negative effect on the quality and quantity of the soils in the area. Construction of the pipeline would not intersect any historic or permitted landfill sites but would pass within 500m of several sites. The construction of pumping stations will require permanent land take of a small scale of land in Agricultural Land Classification Grade 3 land. There are no sites in proximity that are designated for their geological value.	Medium	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over the medium term, but these will be minimised through best practice construction techniques. An AQMA is within 1km and construction traffic will aim to avoid that designation. Operation of the scheme will result in local air emissions from the pumping stations, although this is anticipated to be negligible.	Small	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in medium-term GHG emissions due to activities such as vehicle movements and use of generators. Operation of the scheme will require some additional annual energy consumption associated with increased pumping, with a minor adverse impact on greenhouse gas emissions.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a beneficial contribution (up to 30Ml/d) to securing a supply-demand balance over the future, taking account of climate change risks and uncertainties. This will help to increase resilience to climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) High (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are a number of sites designated for their heritage value within 1km of the scheme; including a number of listed buildings (three Grade II*). There is potential for adverse construction effects on the setting of these designations as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Large	Moderate	Medium-term (adverse)	Temporary	Low (adverse) Low (beneficial)	Moderate (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	Construction of the pipeline will intersect Greenbelt, temporarily impacting upon the openness of this designation. However, the pipeline would not be visible once completed.	Large	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R2 Ouse Raw Water Transfer**
Scheme description	This scheme is for a new pipeline (4.8km) connecting an existing abstraction point to an existing pipeline. The scheme will utilise the existing raw water licence on the River Ouse by transferring it to a WTW, rather than treating at source. This WTW was rebuilt in AMP5 to abstract and treat up to 35Ml/d at the new works. This leaves up to 60Ml/d of the 96Ml/d annual average licence available to transfer to another WTW. The scheme proposes to build infrastructure to provide 60Ml/d maximum supply within the constraints of the existing annual average licence permissions. The scheme would provide a yield of 60Ml/d. The implementation period for this option is anticipated to be 3 years.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA screening has been undertaken to assess potential impacts that the scheme might have on an SAC, which is supported by two watercourses. No likely significant effects on the SAC are anticipated. The HRA also considered an SAC ,SPA and Ramsar. Overall the HRA concluded that it was unlikely that there would be any likely significant effects, however there is uncertainty with regards to the existence or extent of risks of a likely significant effect on the feature. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. There are two LNRs within proximity to the scheme. Both of these are over 2km from the scheme location and are not dependent on flows in the River Ouse, therefore no adverse impacts are anticipated. There are two water-dependent SSSIs downstream of the abstraction point but these are unlikely to be adversely impacted as the sites are primarily reliant on flood flows which will not be impacted by the scheme. The abstraction and new pipeline intersects the a SSSI IRZ. Consultation with Natural England will be required regarding mitigation for potential impacts on designated sites during project planning.	Small	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing surface water flows. However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction.	Small	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk or introducing INNS through construction activities. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS.	Small	Moderate	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 65 biodiversity units would be lost during construction of the pipeline to connect the WTW to the existing pipeline (under a worst case scenario). For areas of habitat affected by construction, for example, along the pipeline, this will provide minor beneficial opportunities for compensatory planting and habitat enhancement.	Medium	Low	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Construction works at the abstraction point would take place within the boundary of an existing WTW which is located adjacent to a railway line. It is therefore anticipated that there will be negligible impacts on human health from noise, dust and vibration during the construction phase assuming best practice methods are used. Short-term nuisance from noise, dust and vibration may be a small risk to recreational activity alongside the river Ouse, a Path and local footpaths near to where the new pipeline will be constructed, as well as from traffic congestion during construction of the pipe bridge over the River Ouse and the road crossing for short periods of time (<6 months). These risks will be mitigated as far as possible through best construction practices and are assessed as no greater than minor adverse. An increase of 60Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at a reasonable cost.	Small (adverse) Medium (beneficial)	Moderate (adverse) High (beneficial)	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) High (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Medium term nuisance from noise, dust and vibration may be a small risk to recreational activities along side the River Ouse, a Path and local footpaths near to where the new pipeline will be constructed, as well as from traffic congestion during the construction phase of the pipe bridge over the River Ouse and a road crossing for short time periods. These risks will be mitigated as far as possible through best construction practices and are assessed as no greater than minor adverse. The scheme will not improve access to recreation and the environment, and during scheme operation the scheme will not affect access to greenspace (ha) and will have no bearing on recreation.	Small	Moderate	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help to reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme. The scheme will make use of existing infrastructure where possible. Once operational, minimal material inputs will be required for the pipeline other than for general maintenance. Minor additional resources will be needed for treatment chemicals and power for pumping.	Small	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Construction impacts should be mitigated by best practice methods to prevent pollution of the River Ouse. The abstraction would be from the Ouse from River Nidd to Stillingfleet Beck a WFD groundwater body (GB104027069593). There is no risk of deterioration in WFD status associated with this scheme. The scheme is unlikely to affect water quality in the long term. Increased abstraction at low flows will be well within existing abstraction licence limits and will have a negligible adverse effect on dilution capacity for the two sewage treatment works downstream of the intake.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The increased abstraction of 60Ml/d will be within the existing abstraction licence limits. Water availability is at least 50% in the zone of influence of the scheme. The abstraction is assessed as a minor adverse impact on low flows during operation. There are no WFD compliance risks associated with the scheme.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, several of the scheme components will be located within or in proximity to Flood Risk Zones 2 or 3. As such, temporary mitigation measures may be required to alleviate flood risk. However, the vast majority of the assets in the Flood Risk Zones will be below ground (pipeline) with only a very small footprint above ground. The effects on flood storage are therefore assessed as negligible (subject to the findings of any Flood Risk Assessment and assuming the new pipe bridge is designed such it does not impact on flood flows). The additional abstraction will have negligible effect on flood flows.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme would not have any direct effects on water efficiency, and is not likely to increase awareness of water sustainability or reduce per capita consumption.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction groundworks will be constrained to a small footprint and are anticipated to have a negligible adverse impact in the soil quality. Therefore there will not be any opportunities for the restoration of land-based habitats (ha). No adverse effects are anticipated on geology or overall land-use management. The scheme (pipeline) would not affect any sites designated for geological interest. The potential effects on soil associated with the construction work are considered small scale, temporary and reversible.	Small	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase will give rise to emissions and dust over the short term. These will be minimised through construction best practice methods. Part of the construction work will be within proximity to an AQMA. However, the temporary level of increase in air emissions associated with the scheme is not considered likely to have greater than a minor impact on the AQMA. Operation of WTW and pumping station will give rise to air pollutant emissions at a local scale.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Currently unknown HGV movements will be required during construction of the pipeline and associated works at WTWs, which are likely to have an effect on GHG emissions. Additional annual energy consumption will be required during operation of the scheme associated with increased pumping and water treatment chemical use, with minor impacts on GHG emissions. The scheme is also anticipated to result in additional carbon emissions during construction.	Small	Moderate	Medium-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute to a secure supply-demand balance over the next 25 years, improving the resilience to the threats of climate change.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	A Scheduled Monument is within 1km of pipeline; and there are two Scheduled Ancient Monuments within 1km of the WTW. However, construction of the scheme is not expected to adversely affect these sites. There are no other known historical assets in proximity to the scheme intake and pumping station or the pipeline route. However, the construction of the scheme will involve excavation which could affect unknown buried assets in an area that has a high level of heritage/archaeological interest (although no impacts were recorded during extension works at the WTW site in 2011-12). The WTW site has been used for a water treatment works since 1846. A watching brief, surveys and investigation may be implemented during construction if required, particularly of the new pipeline, to reduce the risk of adverse impact to any unknown assets. Further studies will determine mitigation requirements closer to project implementation. Operation of the scheme will not influence the hydrological setting of any water-dependent assets (assuming the pipeline construction does not interrupt groundwater flows) nor will it permanently influence any other aspects of heritage assets or landscapes.	Small	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are no designated landscapes associated with the scheme footprint. During construction, the scheme will present small-scale temporary effects on visual amenity in the local area. These effects may be most apparent in the proximity to the River Ouse, the new pipe bridge, A road crossing, and Public Rights of Way that the pipeline construction will intersect. the scheme will have no effect on the landscape and visual amenity during operation as the pipeline will be buried and the assets will be within the existing WTW site.	Small	Small	Long-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial

Scheme name	**R3 Increased River Ouse pump storage capacity**									
Scheme description	This scheme is to increase the pumping capacity at an existing pumping station to 150Ml/d (within licence flow constraints) by installing new pumps and an additional pipeline. This scheme assumes the additional yield under normal operations will be constrained to 10Ml/d (134Ml/d total) with the ability to increase to provide the full 150Ml/d as a temporary measure if required in an emergency situation. This scheme includes a twin pipeline river crossing to reduce the risk of the scheme failing. The scheme would provide a yield of 10Ml/d. The anticipated implementation period is expected to be one year planning and one year construction with full yield available at end of year.									
SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA was conducted to assess the possible impacts that the scheme would have at two SACs. These sites are not hydrologically linked to the proposed scheme and are remote from the proposed pipeline route; therefore no likely significant effects on either site are expected. The HRA also considered an SAC SPA and Ramsar and identified potential for likely significant effects (with uncertainty) during the sea lamprey migratory period related to the potential effect of fully licenced abstraction (an up to 2% decrease in low (Q95) flows) on the dissolved oxygen concentrations in the area. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see HRA for full details. There are five SSSIs within proximity to the pipeline component of the scheme. All sites are within 1.5km of the pipeline route, with potential for some temporary adverse effects from construction activities. Construction would be passing approximately 500m from a SSSI. The potential construction impacts have been assessed as minor risk taking account of best practice construction methods and careful timing of work to avoid breeding/nesting seasons. Consultation with NE will be required regarding mitigation for potential impacts on these SSSIs during project planning. Uncertainty surrounds the potential impact from the pipeline construction on various NERC Section 41 and other species (birds, great crested newts, bats, otter, water vole, common reptiles, badgers), and potential risk of the spread of invasive species. However, careful mitigation during construction should ensure no greater than minor adverse impacts. Impacts from operation of the scheme on the aquatic habitats and ecology of the River Ouse downstream are assessed as negligible as the additional abstraction volume of 10 Ml/d can only be abstracted when river flows exceed 650 Ml/d (10 Ml/d represents 1.5% of 650 Ml/d) under the abstraction licence. Two sites of ancient woodland are intersected by the current proposed pipeline route; the effects of this would need to be mitigated by modifications to the route wherever possible to avoid short-term and long-term effects. The construction phase of the scheme assets may have a medium-term (< 2yrs) temporary effect on local, non-designated sites over a small area (~10 ha of the pipeline route). These effects will be mitigated by best practice construction methods and carrying out works at an appropriate time of year.	Large	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (adverse)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing surface water flows. However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Invasive species may be present at construction sites. There is a negligible risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it is increasing the capacity of an existing water transfer.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 307 biodiversity units would be lost during construction of the pipeline; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The site does not fall within a Natural Improvement Area.	Medium	Low	Long-term	Permanent	Medium	Medium	None	Moderate Beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Mitigation measures and construction best practice techniques will minimise possible nuisance from noise, dust and vibration on local residents. It is anticipated that effects will be minimal as the pipeline route mainly passes through rural areas with low population density. Localised, temporary traffic impacts associated with construction works will potentially cause minor adverse disruption to the road network in the local area. Mitigation measures such as considerate construction traffic timetables and traffic management will be used to minimise impact upon local communities. An increase of 10Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost. Operation of the scheme will not result in any improvements to human health or well-being.	Large (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Pipeline construction and improvement activity will potentially result in temporary disruption to some recreational activities over the short term. There are a number of public footpaths and roads within the vicinity of the pipeline that may be temporarily disrupted during the construction works. These adverse effects will be mitigated as far as possible by methods such as footpath diversion routes through liaison with local stakeholders. However, construction and operation of the scheme will not result in any effects on the water environment.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme. The scheme will make use of some existing pipeline infrastructure. Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for treatment chemicals and power for pumping.	Large	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The pipeline construction will cross or come in proximity of a significant number of watercourses. Medium-term construction impacts should be mitigated by best practice methods to prevent pollution of any watercourses. The WFD assessment concluded there is unlikely to be deterioration in water quality in the WFD water body. The scheme is unlikely to affect water quality in the long term. The increased abstraction will only be permitted under the abstraction licence conditions at flows greater than 650 Ml/d, leading to negligible adverse effects on dilution capacity for downstream effluent discharges.	Large	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from a WFD water body. The abstraction will be within existing abstraction licence limits. The WFD assessment identified a up to 2% reduction in very low flows and that impact of the additional abstraction is negligible, and can only occur at flows greater than 650 Ml/d.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the pipeline sections will be located within or in proximity to Flood Risk Zones 2 or 3. As such temporary mitigation measures may be required to alleviate flood risk. However, pipeline will be buried and therefore the permanent effects on flood storage are therefore assessed as negligible (subject to the findings of any Flood Risk Assessment), accounting for additional pressures due to climate change. The additional abstraction will have a negligible effect on flood flows.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability, and reduce per capita consumption.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the new pipeline and improvements to the existing pipeline will involve construction groundworks and potentially impact upon areas of greenbelt land, Agricultural Land Classification Grade 2 and 3 lands resulting in minor temporary and medium term disturbance to soils and land-use. As the pipeline will be buried and land reinstated, this will have no long-term adverse effects on soils. No long-term adverse effects are anticipated on geology or overall land-use management.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with the construction phase will give rise to air emissions and dust over the medium-term; these will be minimised through construction best practice methods. The scheme is not within proximity to AQMAs.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction work and vehicle movements associated with the construction phase will give rise to GHG emissions over the medium-term; these will be minimised through construction best practice methods. Operation of the scheme will require very modest additional annual energy consumption associated with increased river intake pumping and additional water treatment chemical use at an existing WTW, with a negligible adverse impact on greenhouse gas emissions. The scheme is also anticipated to result in additional carbon emissions during construction.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a contribution (10Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are four Grade II listed buildings within proximity to the pipeline. These are potentially at risk of suffering from adverse impacts from construction and may require modification of the route in dialogue with the property owners and English Heritage to avoid short-term and long-term effects. There are also two Scheduled Ancient Monuments within 1km of the proposed pipeline route and pumping station a Registered Park and Garden is located towards the end of the pipeline (and crosses over the proposed route), whilst another site is within 1km proximity to the Pumping Station. Finally, a section of the proposed pipeline route is adjacent to a historic battlefield . The construction of the scheme will involve excavation which could affect unknown buried assets. A watching brief, surveys and investigation may be implemented during construction if required to reduce the risk of adverse impact to any unknown heritage assets. Operation of the scheme is unlikely to have an adverse effect on any heritage asset or setting.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme is not located within any designated areas. There may be small scale, temporary adverse effects on visual amenity and non-designated sites during construction over the medium term. The scheme infrastructure will predominantly be buried after construction with no long-term impact during operation.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	**R3a Increase River Ouse pump storage capacity**
Scheme description	This scheme is to alter the licence arrangements on the River Ouse for a proportion of the WTW licence volumes to be transferred to another abstraction point to increase permitted abstraction rates at the WTW at low flows. The operation of the scheme would see up to 15Ml/d of the WTW license transferred to another WTW to allow additional abstraction at the WTW when flows are below the lowest Hands Off Flow (HoF) condition (400Ml/d) and when the flows are in the 400-650Ml/d flow band. The scheme would provide a benefit as an annual average of 0.3Ml/d as it would only be a benefit when flows are in the lower flow bands. Under the terms of the licence, water can be transferred to the other WTW using existing infrastructure. There are no construction activities associated with this option.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA was conducted to assess the possible impacts that the scheme would have upon three SACs, SPA and Ramsar. The Two SACs are not hydrologically linked to the proposed scheme; therefore no likely significant effects on either site are expected. The HRA alsoidentified potential for likely significant effects (with uncertainty) during the sea lamprey migratory period related to the potential effect of an up to 4% reduction in flows at the lowest HoF and uncertainties regarding dissolved oxygen sag. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see HRA for full details. Impacts from operation of the scheme on the aquatic habitats and ecology of the River Ouse downstream are assessed as negligible.	Large	Medium	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (adverse)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing surface water flows. However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Operation of the scheme is not expected to introduce or spread INNS, as it is a licence transfer at existing abstractions and therefore is not creating any hydrological connections. There are no construction works associated with this option.	Medium	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	An increase of up to 15Ml/d in deployable output (over short period, average annual increase in deployable output of 0.3Ml/d) will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost. Operation of the scheme will not result in any improvements to human health or well-being and there is no construction phase associated with this scheme.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Operation of the scheme will not result in any significant effects on the water environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system,	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy or reduce water lost via leakage. Scheme construction will not require use of new materials as there is no construction associated with the scheme. The scheme will make use of existing infrastructure.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The WFD assessment concluded there is unlikely to be deterioration in water quality in the concerned WFD water body. An additional flow reduction associated with this option would lead to a reduction in low flows of up to 4%, leading to negligible adverse effects on dilution capacity for downstream effluent discharges.	Large	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from the WFD water body. The WFD assessment identified that additional abstraction associated with this option would lead to a 4% reduction in flows at the lowest HoF value (400Ml/d) compared to baseline conditions and that impact of the additional abstraction is negligible.	Large	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The additional abstraction will have a negligible effect on flood flows.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	No impact upon local geology or land quality is anticipated from the operation of this option.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	No additional air emissions are associated with the operation of this option. The scheme is not within proximity to AQMAs.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Operation of the scheme will require very modest additional annual energy consumption associated with increased river intake pumping and additional water treatment chemical use at the WTW, with a negligible adverse impact on greenhouse gas emissions.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a small contribution (up to 15Ml/d over short periods, averaged over the year to 0.3Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and	There are no construction activities associated with this option. Operation of the scheme and associated impacts on river flow is unlikely to have an adverse effect on any heritage asset or setting.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the	The scheme will not require any new infrastructure therefore there will be no long-term impact during operation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Scheme name	**R5 Aquifer Storage and Recovery Scheme 1**
Scheme description	This scheme involves the storage of potable water in the Triassic Sherwood Sandstone aquifer near the WTW. An aquifer storage and recovery (ASR) system is already in place, consisting of a single borehole which provides storage for up to 5Ml/d. The existing ASR is currently not utilised. This scheme will include operational improvements to ensure the existing ASR is brought into supply before investment in additional storage. Following operational improvements, the scheme would involve the expansion of the existing ASR to increase the volume of water that can be injected and re-abstracted from the aquifer, which is controlled by the number and pumping rate. The aquifer has no connecting flow therefore is suitable for injecting water to be abstracted when needed. The proposed expansion would increase the injection capacity from 5Ml/d to 25Ml/d. The initial assumption is that injection of water into the aquifer would occur for 120 days of the year at a rate of 25Ml/d, followed by 90 days residence time when it is assumed up to 20% is lost. This provides a stored yield of up to 3,000Ml, which would be re-abstracted during the following 90 days. The stored yield would provide 33Ml/d over 90 days, but with 20% losses, it is reduced to 26.67Ml/d. This equates to 6.58Ml/d average yield. Phase 1 will include drilling and testing, procuring land and investigating the hydrogeology/operational implications of expanding the current ASR. It is estimated three to seven additional boreholes will be required to inject 25 Ml/d. The aquifer will need to be flushed several times to ensure all existing flow is removed. Phase 2 would involve finalising the headworks, installing chlorination units and pumps at each site and installing the connecting pipe work to transfer the yield to an existing WTW. The abstraction would remain within the existing permitted volumes licenced. The implementation period of this option is anticipated to be 5 years.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening assessed the potential effects of this scheme on the European designated sites and concluded no likely significant effects on these European sites are expected. The HRA also considered the potential impacts associated with increased abstraction. The scheme is unlikely to adversely affect flows in the River with abstractions taking place within existing licensed limits to augment aquifer storage during periods of moderate to high flows and result in an ~1-2% reduction in flows, however there remains uncertainty with regards to the extent of hydrological changes and the potential impact on sea lamprey migration, bullhead habitat and otter. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see HRA for full details. There are four SSSIs within proximity of the scheme and one LNR. These sites are all water sensitive. However, with abstraction only taking place at moderate to high flows and within existing abstraction licence limits, impacts will be limited. The rate of abstraction (maximum 25 Ml/d) will not impact on the episodic flood flows that are important to the hydrological requirements for protected sites. The scheme involves abstraction of 25 Ml/d at moderate to high flows rather than at low flows to recharge the aquifer and as such this will help to minimise the impact of abstraction on other non-designated habitats and species. Even if abstraction took place at lower flows, the abstraction of up to 25 Ml/d represents only 8% of the Q95 flow. Consultation with NE regarding mitigation for impacts on these SSSIs will be required during project planning. Dependent on more detailed design for this scheme, there may be temporary construction impacts on an SSSI from the ground water construction, although these would be mitigated as far as possibly by careful design and location of the assets to avoid impact on the site. Construction work would not impact upon the other designated sites provided best practice construction methods are employed to mitigate effects of dust, noise and vibration.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The abstraction is not likely to give rise to adverse effects on fresh water provisioning services, as it will only occur at high flows and will be a negligible proportion of the flow. No water-dependent features are likely to be affected by the abstraction. There may be minor adverse effects on recreation and aesthetics due to disturbance to three protected sites, public paths and rights of way.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Invasive species may be present at construction sites. There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme will involve transfer of water within the River Derwent catchment, however is not anticipated to increase the spread of invasive species.	Small	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 0.07 biodiversity units would be lost during expansion of the ASR; this will provide negligible beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Natural Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Negligible beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The construction may result in temporary minor nuisance from noise, dust and vibration. These effects will be most notable in population centres near to the construction activity. The overall impact is expected to be minor given the low population density for the local area. The construction work also has the potential to affect some local transport links, through increased traffic flows and potential construction of crossings. All of these effects will be mitigated as far as possible through best practice construction measures such as by footpath diversions and liaison with local authorities and stakeholders. An increase of 6.58Ml/d (averaged over a year) in deployable output (annual average) will help to maintain the supply-demand balance support human health and well-being.	Small (adverse) Small (beneficial)	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction of the connecting pipelines and abstraction equipment may result in temporary disruption to some recreational facilities such as public paths, rights of way and greenspace in the medium-term. However, construction and operation of the scheme is unlikely to affect access to the water environment.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (construction and connection of five boreholes to the Yorkshire Water Grid). The scheme will make use of some existing infrastructure. Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Long-term (adverse) Long-term (beneficial)	Permanent (adverse) Permanent (beneficial)	Medium (adverse) Medium (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Minor beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	New abstraction may pose some risk to the quality of groundwater sources through the introduction of contaminants from components and construction equipment. These and other pollution risks from construction should be mitigated by best practice methods. The scheme is unlikely to affect water quality downstream given that abstraction will occur at moderate to high flows, leading to negligible adverse effects on dilution capacity for any downstream effluent discharges (there are no sewage treatment works downstream to the river confluence). No risk of deterioration in chemical status at a groundwater body or local scale as only injected water will be re-abstracted.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	As this option is an ASR, the water is re-abstracted and will not exceed the amount injected, therefore surface waters should not be impacted by a reduction in flow. The aquifer is not thought to have any connecting flow there is suitable for injection. The volume of water will be increased within the aquifer, however testing will be undertaken to understand the storage capacity of the aquifer. Only water injected into the aquifer will be re-abstracted thus the water balance of the overall aquifer is unlikely to be impacted.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zone 3. As such temporary mitigation measures may be required to alleviate flood risk. However, the short pipeline will be buried and there will be little above ground land-take, therefore the permanent effects on flood storage are assessed as negligible (subject to the findings of any Flood Risk Assessment), accounting for additional pressures due to climate change. The additional abstraction will have a negligible effect on flood flows.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability, or reduce per capita consumption, except in the short-term during the construction phase.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The southernmost half of the proposed abstraction zone is made up entirely of Grade 1 Agricultural land. As such the small-scale drilling of boreholes and construction of the connecting pipeline will have a short term, temporary effect on the quality and quantity of the soils in the area. Drilling of boreholes may have a minor adverse impact on the geology of the area. No long-term adverse effects are anticipated on soils, geology or overall land-use management.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor Adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	There are no AQMAs within proximity of the scheme. Construction work and vehicle movements associated with the construction phase will give rise to emissions and dust over the medium-term; these will be minimised through construction best practice methods. Operation of the scheme will result in local air emissions from the pumping station.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in medium-term GHG emissions due to activities such as vehicle movements and use of generators. Operation of the scheme will require some additional annual energy consumption associated with increased river and groundwater pumping and minor additional water treatment chemical use at the WTW, with a minor adverse impact on greenhouse gas emissions.	Small	Medium	Medium-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a contribution (6.58Ml/d annual average) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There is only one listed asset within close proximity to the scheme. Dependent on the final location of the abstraction zones and pipework, there is the risk of adverse impacts associated with the construction phase of the scheme on a temporary basis. However, the scheme will be designed to avoidthe asset and Yorkshire Water will consult with the property owner and Historic England if required. Construction work also has the potential to disturb unknown buried assets, however this would be further evaluated by desk studies and other investigations prior to construction. A watching brief, surveys and investigation would be implemented if required during construction to reduce the risk of adverse impact to any unknown heritage assets. Operation of the scheme is unlikely to have an adverse effect on any heritage asset or setting.	Small	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme is not located within a designated area. However a National Improvement Area is within a 2.5km proximity to the scheme. As a result there may be some minor temporary adverse visual impact upon these designated landscapes during the construction phase. There may also be some minor impact on visual amenity to non-designated landscapes during the construction phase. These effects may be most apparent in proximity to the public rights of way that the scheme will intersect and population centres that it is in proximity to. The scheme will have no long term effects on landscape and visual amenity during operation as the pipework will be buried and the above-ground components of the boreholes will be very small in scale.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	R6 South Yorkshire Groundwater Option 1
Scheme description	This scheme relates to development of practical options to optimise the use of the South Yorkshire groundwater group abstraction licence by improving connectivity with the Yorkshire Water Grid system. This will enable the use of underutilised licensed boreholes more widely. This option plans to optimise the South Yorkshire group licences by improving connectivity with the grid, so that the currently underutilised licence quantity (estimated to be between 12 and 20Ml/d), can be exported to the grid system. The scheme would utilise spare capacity at one WTW, which already treats water from the abstraction, to support the grid. The treatment works maximum output capacity is 65Ml/d; whereas actual average output is generally below this (under 50Ml/d). Based on the information available, a solution would be to install booster pumps to pump back to the grid connection. A conservative yield benefit estimate of 12Ml/d has been assumed. Implementation of the scheme would involve the following: • A pumping station, to boost flows (12Ml/d) through the existing 450mm mains, including a connection from the pumping station into the mains. The existing 450mm diameter cast iron pipeline is in good condition. • Land purchase to accommodate the pumping station. • A revised connection arrangement. • Modifications to the network to alleviate undesirable high and low pressures created by the proposal. The scheme would provide a yield of 12Ml/d. The implementation period is anticipated to be 3-5 years.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA was conducted to assess the possible impacts that the scheme would have on designated sites. These sites are not located on the same aquifer to the proposed scheme and are remote from the proposed construction zone; therefore no likely significant effects on either site are expected. Abstraction would be within existing abstraction licence limits from the aquifer and this is unlikely to lead to any adverse effects on biodiversity, flora or fauna. The construction phase of the pumping station and pipeline may have temporary effect on local, non-designated sites over a small area, but these effects will be mitigated by best practice construction methods and carrying out works at an appropriate time of year.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme will have a negligible effects in respect to the improvement natural capital and ecosystem services	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between sites or catchments.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 0.08 biodiversity units would be lost during construction of the booster pumps and connection to the Grid; this will provide negligible beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Negligible beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The construction may result in temporary minor nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures. An increase of 12 Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Small (adverse) Medium (beneficial)	Moderate (adverse) Moderate (beneficial)	Long-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction of the new pumping station, and associated pipeline connections will result in temporary disruption to some recreational facilities such as public paths and rights of way in the short term. However, adverse effects on the water environment for other users are not expected. Operation of the scheme is not anticipated to have any impact upon access to recreation and the environment in the local area.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (materials for a new pumping station and pipeline). However the scheme will make use of a large part of the existing water main. Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Pollution risks from construction activity should be mitigated by best practice methods. The abstraction would be from a WFD groundwater body which is currently classified as of poor chemical status. The WFD assessment identified that linked effects with potential increased saline intrusion are unknown and that further investigation is required to provide further certainty regarding the WFD assessment conclusions. Operation of the scheme will be within existing abstraction limits, but the increase in actual abstraction will put some minor additional pressure on the groundwater quality in the aquifer. The WFD assessment also identified that potential flow reduction in a surface water body which could reduce resilience to dilution of water quality pressures and that further investigation is required.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Abstraction would be within existing abstraction licence conditions however additional abstraction of 12Ml/d will be 20% above the abstraction currently taking place. The WFD groundwater body is classified as being in a poor water balance status. The impacts of this additional abstraction are unknown. There is a potential risk of deterioration between classes for water balance, further investigation is required. There is also potential flow reduction impacts on dependent surface water body status and further investigation is required to understand the connectivity between the aquifer and the associated surface water bodies to confirm the extent of flow reduction.	Medium	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zone 1 - therefore no mitigation measures will be required. There will be little above ground land-take in Flood Risk Zone 1 once the scheme is operational, the permanent effects of the new pumping station (0.1ha) on flood storage are assessed as minor (subject to the findings of any Flood Risk Assessment), accounting for additional pressures due to climate change. The additional abstraction will have a negligible effect on flood flows.	Medium	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency or reduce per capita consumption, and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pumping station and pipeline will have a medium-term, temporary but negligible effect on the quality and quantity of the soils in the area. The construction of the new pumping station will require permanent land take of 0.1ha of land, with the majority of the surrounding area designated as green belt. Given the small-scale of the pumping station, no long-term adverse effects are anticipated on soils, geology or overall land-use management.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over medium-term, but these will be minimised through best construction practices. There are no AQMAs within proximity of the scheme. Operation of the scheme will require some additional annual energy consumption associated with increased groundwater pumping and minor additional water treatment chemical use, with a minor adverse impact on air emissions.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	The construction work and vehicle movements associated with the construction phase will give rise to temporary GHG emissions but these will be minimised through best construction practices. It is anticipated that the construction with result in emission of 465 tonnes of carbon. Operation of the scheme will require some additional annual energy consumption associated with increased groundwater pumping and minor additional water treatment chemical use, with a minor adverse impact on greenhouse gas emissions.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a contribution (12Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are no listed assets or designated features within proximity to the scheme. Construction work has the potential to disturb unknown buried assets. A watching brief, surveys and investigation may be implemented during construction if required to reduce the risk of adverse impact to any unknown heritage assets.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There may be small scale, temporary adverse effects locally on visual amenity due to construction activity within Green Belt. Given the small-scale of the pumping station, permanent visual impact is likely to be mitigated by screening measures. A minor adverse impact has been assessed as detailed external design features and landscaping are unknown.	Medium	Moderate	long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	R6b South Yorkshire Groundwater Option 2									
Scheme description	Transfer of 20 Ml/d to a WTW to the support the South Yorkshire area. This option would install a pipeline to connect the grid system to South Yorkshire. The connection on its own (i.e. no supporting new resource option) does not increase deployable output but it does provide a benefit to the area.									
SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA was conducted to assess the possible impacts that the scheme would have on sites which include water dependant features. The option does not involve additional abstraction from round or surface water. Construction works would be sufficiently far from the sites also, so no likely significant effects are anticipated. The proposed route of the pipeline intersects an SSSI & LNR and direct impacts during construction are likely, including on the deciduous woodland habitat. Additionally the route passes within 1km of four areas of ancient woodland. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning (e.g. use of trenchless technology/tunnelling). The pipeline route encroaches on 0.08ha of priority habitat lowland fens. It is assumed that scheme development at the detailed design stage will ensure rerouting to avoid loss of and impacts on this habitat.	Small	Moderate	Long-term	Temporary	Major (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Moderate adverse effects on the natural capital and ecosystem services could occur during project construction, particularly to high value cultural services such as recreation and tourism and aesthetic value.	Medium	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between sites or catchments.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 159 biodiversity units would be lost during construction of pipelines and other infrastructure; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Natural Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The construction may result in temporary minor nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures. An increase of 20Ml/d in supply to the Doncaster region a will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Small (adverse) Medium (beneficial)	Moderate (adverse) Moderate (beneficial)	Long-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction of the pipeline will result in temporary disruption to some recreational facilities such as public paths and rights of way in the short term. However, adverse effects on the water environment for other users are not expected. Operation of the scheme is not anticipated to have any impact upon access to recreation and the environment in the local area.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (materials for a new pumping stations and pipeline). Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed (power for pumping).	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Construction will cross a number of watercourses and as a result there is the potential for contamination leading from construction, however the likelihood of this will be minimised with good construction practice. This option is the transfer of treated water between water treatment works, as such there is no potential pathways for this option to impact any WFD status elements.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This scheme would not involve abstraction from a waterbody and is not anticipated to impact on groundwater or surface water levels and flow. There are no risks to WFD compliance associated with the operation of this option.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zone 2, some mitigation measures will be required. There will be little above ground land-take in Flood Risk Zone 1 once the scheme is operational, the permanent effects of the new pumping station (0.1ha) on flood storage are assessed as negligible (subject to the findings of any Flood Risk Assessment), accounting for additional pressures due to climate change.	Medium	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency or reduce per capita consumption, and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pipeline will have a medium-term, temporary effect on the quality and quantity of the soils in the area. Approximately 20% of the pipeline route is within Agricultural Land Classification Grade 2 land and construction will have a temporary effect. The construction of the new pumping station will require a small area of permanent land take of Grade 2 Agricultural Land. Given the relatively small-scale of the new assets, no long-term adverse effects are anticipated on soils, geology or overall land-use management.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over medium-term, but these will be minimised through best construction practices. Doncaster AQMA is within 1km of the route which could result in a decrease in air quality in this area.. Operation of the scheme will require some additional annual energy consumption, with a small adverse impact on air emissions.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Scheme construction would be associated with GHG emissions from HGV movements and construction activities. Construction work and vehicle movements associated with construction phase will give rise to temporary GHG emissions over the medium term, but these will be minimised through best construction practices. Operation of the scheme will not be associated with GHG emissions.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute towards securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The proposed route passes through a scheduled monument. Mitigation to reduce impacts will need to be agreed with Historic England at detailed design stage (e.g. use of directional drilling). The route also passes within very close proximity to three Grade II listed buildings, effects from construction are expected to be temporary on these designations and their settings. Construction work has the potential to disturb unknown buried assets. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets.	Medium	Moderate	Medium-term	Temporary	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There may be temporary adverse effects locally on visual amenity due to construction activity within Green Belt. Permanent visual impact is unlikely given the scale of the permeant above ground assets; permanent visual impact is likely to be mitigated by screening measures.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	R6c South Yorkshire Groundwater Option 3
Scheme description	Transfer between the Grid and a WTW to the support the South Yorkshire area. Option includes a opportunity for reverse transfer back to the Grid. This option would install a bi-directional pipeline to connect the grid system to the South Yorkshire. The grid-to-WTW direction would transfer water from another WTW and the connection on its own (i.e. no supporting new resource option) does not increase deployable output, but it does provide a benefit to the area.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA was conducted to assess the possible impacts that the scheme would have on SAC and SPA sites which include water dependant features. The option does not involve additional abstraction from round or surface water. Construction works would be sufficiently far from the sites also, so no likely significant effects are anticipated. The proposed route of the pipeline intersects an SSSI & LNR for approximately 1.2km and direct impacts during construction are likely, including on the deciduous woodland habitat. Additionally the route passes within 1km of four areas of ancient woodland. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning (e.g. use of trenchless technology/tunnelling). The pipeline route encroaches on 0.08ha of priority habitat lowland fens. It is assumed that scheme development at the detailed design stage will ensure rerouting to avoid loss of and impacts on this habitat.	Small	Moderate	Long-term	Temporary	Major (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Moderate adverse effects on the natural capital and ecosystem services could occur during project construction, particularly to high value cultural services such as recreation and tourism and aesthetic value.	Medium	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between sites or catchments.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 159 biodiversity units would be lost during construction of pipelines and other infrastructure; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Natural Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The construction may result in temporary minor nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures. An increase of 10Ml/d in supply to the Doncaster region and opportunity to transfer back to the Grid from WTW will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable	Small (adverse) Medium (beneficial)	Moderate (adverse) Moderate (beneficial)	Long-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction of the pipeline will result in temporary disruption to some recreational facilities such as public paths and rights of way in the short term. However, adverse effects on the water environment for other users are not expected. Operation of the scheme is not anticipated to have any impact upon access to recreation and the environment in the local area.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (materials for a new pumping stations and pipeline). Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed (power for pumping).	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Construction will cross a number of watercourses and as a result there is the potential for contamination leading from construction, however the likelihood of this will be minimised with good construction practice. This option is the transfer of treated water between water treatment works, as such there is no potential pathways for this option to impact any WFD status elements.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This scheme would not involve abstraction from a waterbody and is not anticipated to impact on groundwater or surface water levels and flow. There are no risks to WFD compliance associated with the operation of this option.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zone 2, some mitigation measures will be required. There will be little above ground land-take in Flood Risk Zone 1 once the scheme is operational, the permanent effects of the new pumping station (0.1ha) on flood storage are assessed as negligible (subject to the findings of any Flood Risk Assessment), accounting for additional pressures due to climate change.	Medium	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency or reduce per capita consumption, and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pipeline will have a medium-term, temporary effect on the quality and quantity of the soils in the area. Approximately 20% of the pipeline route is within Agricultural Land Classification Grade 2 land and construction will have a temporary effect. The construction of the new pumping station will require a small area of permanent land take of Grade 2 Agricultural Land. Given the relatively small-scale of the new assets, no long-term adverse effects are anticipated on soils, geology or overall	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over medium-term, but these will be minimised through best construction practices. An AQMA is within 1km of the route which could result in a decrease in air quality in this area.. Operation of the scheme will require some additional annual energy consumption, with a small adverse impact on air emissions.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Scheme construction would be associated with GHG emissions from HGV movements and construction activities. Construction work and vehicle movements associated with construction phase will give rise to temporary GHG emissions over the medium term, but these will be minimised through best construction practices. Operation of the scheme will not be associated with GHG emissions.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute towards securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The proposed route passes through a scheduled monument. Mitigation to reduce impacts will need to be agreed with Historic England at detailed design stage (e.g. use of directional drilling). The route also passes within very close proximity to three Grade II listed buildings, effects from construction are expected to be temporary on these designations and their settings. Construction work has the potential to disturb unknown buried assets. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets.	Medium	Moderate	Medium-term	Temporary	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There may be temporary adverse effects locally on visual amenity due to construction activity within Green Belt. Permanent visual impact is unlikely given the scale of the permanent above ground assets; permanent visual impact is likely to be mitigated by screening measures.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	R6d South Yorkshire Groundwater Option 4
Scheme description	Transfer between the Grid and a WTW to the support the South Yorkshire area. Option includes a opportunity for reverse transfer back to the Grid. This option would install a bi-directional pipeline to connect the grid system to the South Yorkshire. The grid-to-WTW direction would transfer water from another WTW and the connection on its own (i.e. no supporting new resource option) does not increase deployable output but it does provide a benefit to the area.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA was conducted to assess the possible impacts that the scheme would have on sites which include water dependant features. The option does not involve additional abstraction from round or surface water. Construction works would be sufficiently far from the sites also, so no likely significant effects are anticipated. The proposed route of the pipeline intersects an SSSI & LNR for approximately 1.2km and direct impacts during construction are likely, including on the deciduous woodland habitat. Additionally the route passes within 1km of four areas of ancient woodland. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning (e.g. use of trenchless technology/tunnelling). The pipeline route encroaches on 0.08ha of priority habitat lowland fens. It is assumed that scheme development at the detailed design stage will ensure rerouting to avoid loss of and impacts on this habitat.	Small	Moderate	Long-term	Temporary	Major (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Moderate adverse effects on the natural capital and ecosystem services could occur during project construction, particularly to high value cultural services such as recreation and tourism and aesthetic value.	Medium	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between sites or catchments.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 159 biodiversity units would be lost during construction of pipelines and other infrastructure; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Natural Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The construction may result in temporary minor nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures. An increase of 20Ml/d in supply to the Doncaster region and opportunity to transfer back to the Grid from Nutwell WTW will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Small (adverse) Medium (beneficial)	Moderate (adverse) Moderate (beneficial)	Long-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction of the pipeline will result in temporary disruption to some recreational facilities such as public paths and rights of way in the short term. However, adverse effects on the water environment for other users are not expected. Operation of the scheme is not anticipated to have any impact upon access to recreation and the environment in the local area.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (materials for a new pumping stations and pipeline). Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed (power for pumping).	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Construction will cross a number of watercourses and as a result there is the potential for contamination leading from construction, however the likelihood of this will be minimised with good construction practice. This option is the transfer of treated water between water treatment works, as such there is no potential pathways for this option to impact any WFD status elements.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This scheme would not involve abstraction from a waterbody and is not anticipated to impact on groundwater or surface water levels and flow. There are no risks to WFD compliance associated with the operation of this option.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zone 2, some mitigation measures will be required. There will be little above ground land-take in Flood Risk Zone 1 once the scheme is operational, the permanent effects of the new pumping station (0.1ha) on flood storage are assessed as negligible (subject to the findings of any Flood Risk Assessment), accounting for additional pressures due to climate change.	Medium	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency or reduce per capita consumption, and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pipeline will have a medium-term, temporary effect on the quality and quantity of the soils in the area. Approximately 20% of the pipeline route is within Agricultural Land Classification Grade 2 land and construction will have a temporary effect. The construction of the new pumping station will require a small area of permanent land take of Grade 2 Agricultural Land. Given the relatively small-scale of the new assets, no long-term adverse effects are anticipated on soils, geology or overall land-use management.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over medium-term, but these will be minimised through best construction practices. An AQMA is within 1km of the route which could result in a decrease in air quality in this area.. Operation of the scheme will require some additional annual energy consumption, with a small adverse impact on air emissions.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Scheme construction would be associated with GHG emissions from HGV movements and construction activities. Construction work and vehicle movements associated with construction phase will give rise to temporary GHG emissions over the medium term, but these will be minimised through best construction practices. Operation of the scheme will not be associated with GHG emissions.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute towards securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The proposed route passes through a scheduled monument. Mitigation to reduce impacts will need to be agreed with Historic England at detailed design stage (e.g. use of directional drilling). The route also passes within very close proximity to three Grade II listed buildings, effects from construction are expected to be temporary on these designations and their settings. Construction work has the potential to disturb unknown buried assets. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets.	Medium	Moderate	Medium-term	Temporary	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There may be temporary adverse effects locally on visual amenity due to construction activity within Green Belt. Permanent visual impact is unlikely given the scale of the permeant above ground assets; permanent visual impact is likely to be mitigated by screening measures.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R8b Sherwood Sandstone and Magnesian Limestone Boreholes Option 2**									
Scheme description	The option would consist of a new 5.0 Ml/d wellfield abstracting from the Magnesian Limestone, and construction of a new water treatment works and pipeline to connect to the existing SRE.									
SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA Screening considered potential impacts on the SAC, however it is therefore considered to be unlikely that the sites are hydrologically connected. No likely significant effects are anticipated. The pipeline between the new treatment plant and the SRE will be within 2km and the proposed abstractions within 7km of a SSSI (a water sensitive meadows site). The SSSI is underlain by glacial lacustrine deposits of variable permeability and supported by surface water streams. Impacts from groundwater abstraction on these streams are unlikely, they cannot be ruled out at this stage. Further investigation and pump testing would be required to confirm any impact. The construction requirement of the various scheme assets, may cause medium-term, temporary (~2 years) minor effects on non-designated habitats over a small area. These effects will be mitigated as far as possible and undertaken at an appropriate time of year.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (adverse)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing groundwater flows. Natural capital and ecosystem services are not anticipated to be affected. Construction of the new treatment plant and pipeline may disturb non-designated natural capital assets, but there are no areas of land recognised for their natural capital value. Construction could negatively affect some local areas of deciduous woodland.	Small	Moderate	Short-term	temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is the potential for INNS to be spread in the construction phase, however this can be minimised with good construction practice. Operation of the scheme does not connect any hydrological features that were previously not connected and therefore the effect of INNS is considered to be negligible.	Medium	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	An estimated 71 biodiversity units would be lost during construction of the wellfield; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Medium	Low	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme construction phase is likely to result in temporary minor nuisance from noise, dust and vibration, although the construction areas are predominantly in rural locations. The pipeline will end in a settlement, and there will also be construction close to neighbouring town. As a result, residents are likely to experience adverse impacts from construction. These will be mitigated as far as possible through best construction practices. An increase of 5Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost. During operation, the scheme will not result in any improvements or detriment to human health. Operation of the scheme will not affect access to open spaces.	Medium (adverse) Small (beneficial)	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction of the scheme is not within close proximity to any water environment, and therefore there would not be any adverse impacts anticipated on the viability of the water environment as a recreational asset. Construction would be in close proximity to the a local Strategic Route - and this recreational asset would experience negative effects on its setting during Construction. Minor impacts are predicted during construction or operation.	Small	Low	Medium-term	Temporary	Low	Medium	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy or reduce water lost via leakage. Once operational, minimal material inputs will be required for regular maintenance. A small amount of additional resources will be needed for treatment chemicals and power for pumping.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	During construction the scheme will not be in proximity of any WFD surface waterbodies and therefore there is no potential for reductions in water quality arising from construction of the scheme. There is no risk of deterioration in WFD chemical status associated with the operation of this scheme. Boreholes in this location were originally closed due to bacteria contamination and previously relied on chlorination, so the possibility of bacterial contamination of extracted water cannot be eliminated.	Large	Low	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	During Operation the scheme will move water from the groundwater body to the surface for abstraction. This will result in reduced groundwater levels to the extent of 5Ml/d. The WFD assessment has considered risk to WFD groundwater body. This option would abstract a relatively small amount of water from a groundwater management unit where there is water available. As such, there is not a risk to the water balance status of the water body. The WFD assessment has identified the possibility of connectivity between WFD water body and potential for a significant change in flows in this water body. Further investigation to understand the current flows in the WFD water body and the potential impact on these river flows associated with a new groundwater abstraction is required.	Large	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some construction works will be located within or in proximity to Flood Risk Zones 2 and 3 and as such temporary mitigation measures may be required to alleviate flood risk. Although the pipelines will be buried, a number of very small assets will be permanently located in FRZs 2 and 3 but with negligible impact on floodplain storage. The river flow augmentation will have no impact on flood flows as it will only be required during periods of low flow and the volumes discharged to the river are negligible in comparison to flood flows.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pipelines and boreholes will have a short term, temporary effect on the quality and quantity of the soils in the area. The construction of the new boreholes will require permanent land take of around 0.2ha (which includes Grade 2 and 3 Agricultural Land). Given the relatively small-scale of the new assets, no long-term adverse effects are anticipated on soils, geology or overall land-use management.	Small	High	Short-term	temporary	Low	Low	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary emissions and dust over the short term, but these will be minimised through best construction practices. There are no AQMAs within proximity of the scheme. Operation of the scheme will not be associated with any air emissions.	Small	high	Short-term	temporary	low	Low	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in small-scale greenhouse gas emissions, however, these are considered minor on a small scale. Operation will not result in any further greenhouse gas emissions.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a minor beneficial contribution (5 ML/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are a number of Grade II Listed Buildings within 2km of the proposed construction. All these assets are anticipated to experience reductions in the quality of their setting as a result of the construction, resulting in minor adverse effects and therefore mitigation may be necessary. Construction work has the potential to disturb unknown buried assets. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets. During operation there may be small changes to the setting of these assets from the new small permanent structures on the surface, but this impact is anticipated to be negligible. No beneficial effects are anticipated.	Small	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are no designated landscapes in the vicinity of the scheme. During construction the scheme will present minor temporary effects on visual amenity in the local area. These effects may be most apparent in proximity to the public rights of way that the construction work may impact upon, including some riverside footpaths, and where works are in close proximity to residential property. The scheme is unlikely to have more than a minor adverse effect on landscape and visual amenity during operation apart from the permanent construction of the water treatment works required as part of the scheme. Mitigation measures should minimise this effect, including sensitive design such that they do not detract from local distinctiveness (the majority of the scheme infrastructure will be buried after construction).	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	R8c Sherwood Sandstone and Magnesian Limestone Boreholes Option 3
Scheme description	The proposed option involves the installation of a new abstraction (5Ml/d). This will include a new treatment works, with a pipeline connecting to the SRE, abstracting from the an aquifer to meet the 5.0 Ml/d target for this option. The option requires a new 5.0Ml/d water treatment works. Treated water will be transferred to the SRE via a new 450mm diameter main.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA considered impacts on designated sites. However, these sites are not located on the same aquifer as the proposed abstraction and as a result, no hydrological connection has been identified. Construction works would be sufficiently far from the sites also, so no likely significant effects are anticipated. The proposed pipeline, abstraction and treatment plant are not within 2km of any sites nationally designated for the biodiversity value. Construction is within 500m of a large river, and construction of the pipeline will cross many other smaller watercourses. Construction of the pipeline may therefore result in slight reductions in the quality of the fluvial habitats in those watercourses, however this will be minimised with good construction practice and this does not hydrologically link the construction to any other designated sites. Construction of the proposed scheme is not anticipated to result in the harm or reduction of any priority habitat. There are not anticipated to be any adverse impacts resulting from operation of the scheme.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (adverse)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have effects on the hydrological cycle at a local scale, by increased levels of abstraction influencing groundwater flows. However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction. Natural capital and ecosystem services are therefore not anticipated to be affected. Construction of the new treatment plant and pipeline may disturb non-designated natural capital assets, but there are no areas of land recognised for their natural capital value.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is the potential for INNS to be spread in the construction phase, however this can be minimised with good construction practice. Operation of the scheme does not connect any hydrological features that previously not connected and therefore the effect of INNS is considered to be negligible.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	An estimated 73 biodiversity units would be lost during construction of the new wellfield, treatment works and pipeline; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Medium	Low	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme construction phase is likely to result in temporary nuisance from noise, dust and vibration. Construction of will be in close proximity to a number of villages. It is predicted that the pipeline construction would also result in travel disruption. An increase of 5Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost. During operation, the scheme will not result in any improvements or detriment to human health. Operation of the scheme will not affect access to open spaces.	Large (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Moderate adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The option will rely on the abstraction of groundwater in order to supplement demand, and construction and operation of the scheme is not in close proximity (<500m) to any significant fluvial environments. Construction of the pipeline will intersect two National Cycle Routes, which will likely need to be temporarily diverted. During operation, it is anticipated that there will be no impact on these recreational assets. as the infrastructure surrounding them will be buried.	Small	Medium	Medium-term	Temporary	Low (adverse)	Medium	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent	The scheme will not help reduce water demand, nor will it (directly) support the use of sustainable/renewable energy or reduce water lost via leakage. Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for treatment chemicals and power for pumping. Resources will be required to construct the infrastructure.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Construction will cross a number of watercourse and as a result there is the potential for contamination leading from construction, however the likelihood of this will be minimised with good construction practice. The abstraction would be from a WFD groundwater body, which is classified as good status for dependent surface water body status, GWDTE's test, water balance and saline intrusion but poor for chemical status. The WFD assessment identified potential for deterioration between classes in relation to chemical pressures and that further investigations are required. Abstractions in this location were originally closed due to bacteria contamination and previously relied on chlorination, so the possibility of bacterial contamination of extracted water should not be eliminated.	Medium	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from a WFD groundwater body. The WFD assessment did not identify any risk to the water balance in this water body. Further investigation would be required to establish the extent of connectivity with a WFD water body and any impact on river flows resulting from the new abstraction.	Large	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some works will be located within Flood Risk Zones 2 and 3 and as such temporary mitigation measures may be required to alleviate flood risk. Although the pipelines will be buried, a number of assets will be permanent, but not within a flood zone, and therefore with negligible impact on floodplain storage.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction will be within many areas of Agricultural Land Classification Grades 2 and 3 land, and the permanent surface infrastructure required for this scheme will be present on Agricultural Land Classification Grade 2 land in part. The scheme relies on extraction of groundwater but it is not anticipated that this will result in changes to geology. Abstracted groundwater is being introduced to the water supply via pipeline and SRE, and as a result geomorphology will not be impacted.	Small	High	Long-term	Permanent	Low	Medium	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary emissions and dust over the short term, but these will be minimised through best construction practices. There are no AQMAs within proximity of the scheme. Operation of the scheme will not be associated with any air emissions.	Small	High	Short-term	temporary	Low	Medium (adverse)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in small-scale greenhouse gas emissions, however, these are considered negligible on a small scale. Operation will not result in any further greenhouse gas emissions.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a minor beneficial contribution (5Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Construction of the scheme would result in adverse impacts to a number of designated heritage assets. There are 2 scheduled monuments within 100m of the construction which are likely to have their settings impacted. The pipeline will also pass through the historic area of a town, which will temporarily impact upon the setting of >20 listed buildings in the area. Construction work also has the potential to disturb unknown buried assets. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets. During operation there may be small changes in the setting of some heritage assets, but this effect is considered to be negligible.	Small	Low	Short-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme is within 5km of the National Park and construction and operation are anticipated to result in minor adverse impacts to the setting of the designated landscape. The scheme is unlikely to have more than a minor adverse effect on landscape and visual amenity during construction or operation. Mitigation measures should minimise this effect, including sensitive design such that they do not detract from local distinctiveness (the majority of the scheme infrastructure will be buried after construction).	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R8f Sherwood Sandstone and Magnesian Limestone Option 6**									
Scheme description	The proposed option involves a new 20Ml/d abstraction from the Sherwood Sandstone Group. This will comprise a new wellfield new 450mm diameter pipeline connections from each abstraction to a new works in the area. Treated water will be transferred to the service reservoir via a new 450mm diameter main.									
SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening assessed potential impacts on SACs and SPAs. No impact pathways during construction are anticipated due to the distance between the proposed works from the European sites. The European sites are located on a moderately productive aquifer with millstone grit group bedrock, whereas the proposed abstractions are located on a highly productive aquifer with intergranular flow on Triassic rocks. Therefore, no hydrological connectivity has been identified and no likely significant effects are anticipated. An SAC is located approximately 16.9 km south-east and no impact pathways during construction are anticipated due to the distance between the proposed works. No significant impacts are anticipated during operation due to the distance and the depth of groundwater at the site. The SSSI is located adjacent the pipeline route and 1.2km from the proposed new works and direct impacts during construction are likely. Additionally an SSSI, an LNR and an LNR are located within 1km of the scheme. The pipeline route encroaches on 0.5ha of priority habitat lowland fens. It is assumed that scheme development at the detailed design stage will ensure rerouting to avoid loss of and impacts on this habitat. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning (e.g. use of trenchless technology/tunnelling).	Small	Moderate	Short-term	Temporary	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing groundwater flows. Natural capital and ecosystem services are not anticipated to be affected. Construction of the new treatment plant and pipeline may disturb non-designated natural capital assets, but there are no areas of land recognised for their natural capital value. Construction could negatively affect some local areas of deciduous woodland.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is the potential for INNS to be spread in the construction phase, however this can be minimised with good construction practice. Operation of the scheme does not connect any hydrological features that were previously not connected and therefore the effect of INNS is considered to be negligible.	Small	Moderate	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 300.64 biodiversity units would be lost during construction of pipelines and other infrastructure; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Natural Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme construction phase is likely to result in temporary minor nuisance from noise, dust and vibration, although the construction areas are predominantly in rural locations the works will be in proximity to a number of small settlements. As a result, residents are likely to experience adverse impacts from construction. These will be mitigated as far as possible through best construction practices. An increase of 20Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost. During operation, the scheme will not result in any improvements or detriment to human health. Operation of the scheme will not affect access to open spaces.	Medium (adverse) Small (beneficial)	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction of the new pipeline would intersect a river, which is likely to result in a temporary impact on recreation and tourism activities. The new pipeline would also be constructed in close proximity to a number of waterbodies. Construction would be in close proximity to a Strategic Route - and this recreational asset would experience negative effects on its setting during construction. Minor impacts are predicted during construction.	Small	High	Short-term	Temporary	Moderate (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy or reduce water lost via leakage. Scheme construction will not require use of new materials as there is no construction associated with the scheme. The scheme will make use of a combination of existing and new infrastructure. Once operational, minimal material inputs will be required for regular maintenance. A small amount of additional resources will be needed for treatment chemicals and power for pumping.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Construction will cross a number of watercourses and as a result there is the potential for contamination leading from construction, however the likelihood of this will be minimised with good construction practice. The abstraction would be from a WFD groundwater body, which is classified as good status for dependent surface water body status, GWDTE's test, water balance and saline intrusion but poor for chemical status. The WFD assessment identified potential for deterioration between classes in relation to chemical pressures and that further investigations are required. The WFD assessment also identified potential pathways to impacting surface water bodies. The assessment concluded that the flow change as a result of additional abstraction from the groundwater body would be small in each of these water bodies and that there was no risk to deterioration in any of the WFD physico-chemical or chemical elements.	Medium	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from a WFD groundwater body. The WFD assessment did not identify any risk to the water balance in this water body. The WFD assessment also identified potential pathways to impacting surface water bodies. It was deemed that the flow change as a result of additional abstraction from the groundwater body would be small in each of these water bodies and that there would be no discernible impact on the flow regime and in-channel habitats.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some construction works will be located within or in proximity to Flood Risk Zones 2 and 3 and as such temporary mitigation measures may be required to alleviate flood risk. Although the pipelines will be buried, a number of very small assets (borehole infrastructure) will be permanently located in Flood Risk Zones 2 and 3 but with negligible impact on floodplain storage.	Small	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pipelines and boreholes will have a short term, temporary effect on the quality and quantity of the soils in the area. The construction will require permanent land take of small areas of Grade 3 Agricultural Land. Given the relatively small-scale of the new assets, no long-term adverse effects are anticipated on soils, geology or overall land-use management.	Medium	Moderate	Short-term	Temporary	Moderate (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary emissions and dust over the short term, but these will be minimised through best construction practices. There are no AQMAs within proximity of the scheme. Operation of the scheme will not be associated with any air emissions.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	The scheme requires construction of a new pumping station and new pipeline. Construction of both of these assets would result in greenhouse gas emissions. Operation of the scheme will require modest additional annual energy consumption associated with pumping and additional water treatment chemical use, with a negligible adverse impact on greenhouse gas emissions.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute towards securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The new pipeline is anticipated to run along, a Grade II Listed Structure, and therefore the value and integrity of this asset may be impacted during construction and operation. There are also further listed buildings within 1km, as well as one Scheduled Monument and one Registered Park / Garden. All these assets are anticipated to experience reductions in the quality of their setting as a result of the construction, resulting in minor adverse effects and therefore mitigation may be necessary. Construction work has the potential to disturb unknown buried assets. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets. During operation there may be small changes to the setting of these assets from the new small permanent structures on the surface, but this impact is anticipated to be negligible. No beneficial effects are anticipated.	Small	High	Long-term	Permanent	Moderate (adverse) Low (beneficial)	Moderate (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are no designated landscapes in the vicinity of the scheme. During construction the scheme will present minor temporary effects on visual amenity in the local area. These effects may be most apparent in proximity to the public rights of way that the construction work may impact upon, including some riverside footpaths, and where works are in close proximity to residential property. The scheme is unlikely to have more than a minor adverse effect on landscape and visual amenity during operation apart from the permanent construction of water treatment works required as part of the scheme. Mitigation measures should minimise this effect, including sensitive design such that they do not detract from local distinctiveness (the majority of the scheme infrastructure will be buried after construction).	Small	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R8g Sherwood Sandstone abstraction support to North Yorkshire**									
Scheme description	The option would comprise a 15 Ml/d abstraction from new boreholes in the Sherwood Sandstone Group. It would require six new boreholes, and associated pumps with pipework to connect to a new WTW, a new treatment works and pipelines to connect to the Bullamoor CRE (5.4 km pipeline) and the Piper Hill SRE (12.2 km pipeline) with a back-up supply to the CWT (16.7 km pipeline).									
SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening assessed potential impacts on designated sites. However, these sites are not located on the same aquifer as the proposed borehole, and as a result, no hydrological connection has been identified. Construction works would be sufficiently far from the sites also, so no likely significant effects are anticipated. An SSSI is located within 1km of the proposed pipeline route. Construction would generate dust emissions and noise disturbance with potential for minor impacts on the SSSIs. Consultation with Natural England regarding mitigation for impacts on the SSSI would be required during project planning. Additionally three areas of ancient woodland are located within 1km of the scheme. Consultation with Natural England regarding detailed design and mitigation for impacts on designated sites and priority habitats would be required during project planning.	Small	Moderate	Short-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing groundwater flows. Natural capital and ecosystem services are not anticipated to be affected. Construction of the new treatment plant and pipeline may disturb non-designated natural capital assets, but there are no areas of land recognised for their natural capital value. Construction could negatively affect some local areas of deciduous woodland.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is the potential for INNS to be spread in the construction phase, however this can be minimised with good construction practice. Operation of the scheme does not connect any hydrological features that were previously not connected and therefore the effect of INNS is considered to be negligible.	Small	Moderate	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 324 biodiversity units would be lost during construction of pipelines and other infrastructure; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Natural Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme construction phase is likely to result in temporary minor nuisance from noise, dust and vibration, although the construction areas are predominantly in rural locations. These will be mitigated as far as possible through best construction practices. An increase of 15 Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost. During operation, the scheme will not result in any improvements or detriment to human health. Operation of the scheme will not affect access to open spaces.	Small (adverse) Small (beneficial)	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Construction of the new pipeline would intersect two rivers, which is likely to result in a temporary impact on recreation and tourism activities. Minor impacts are predicted during construction.	Small	High	Short-term	Temporary	Moderate (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy or reduce water lost via leakage. Once operational, minimal material inputs will be required for regular maintenance. A small amount of additional resources will be needed for treatment chemicals and power for pumping.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Construction will cross a number of watercourse and as a result there is the potential for contamination leading from construction, however the likelihood of this will be minimised with good construction practice. The abstraction would be from a WFD groundwater body, which is classified as good status for dependent surface water body status, GWDTE's test, water balance and saline intrusion but poor for chemical status. The WFD assessment identified potential for deterioration between classes in relation to chemical pressures and that further investigations are required. Due to the high permeability of the Sherwood Sandstone aquifer and the overlaying glacial sands and gravel, there is potential for the ground/surface water interaction. The abstraction is ~0.3km these water bodies which could be impacted. Further investigation is required to understand these impacts.	Medium	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from the a WFD groundwater body. The WFD assessment did not identify any risk to the water balance in this water body. Further investigation would be required to establish the extent of connectivity with two rivers, and any impact on river flows resulting from the new abstraction.	Large	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some construction works will be located within Flood Risk Zones 2 and 3 and as such temporary mitigation measures may be required to alleviate flood risk. Although the pipelines will be buried, a number of assets (borehole infrastructure and a treatment plant) will be permanent, but not within a flood zone, and therefore with negligible impact on floodplain storage.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction will be within many areas of Agricultural Land Classification Grade 3 land, and the permanent surface infrastructure required for this scheme will be present on Agricultural Land Classification Grade 3 land in part. The scheme relies on extraction of groundwater but it is not anticipated that this will result in changes to geology. Abstracted groundwater is being introduced to the water supply via pipeline and a new WTW, and as a result geomorphology will not be impacted.	Small	High	Long-term	Permanent	Low	Medium	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary emissions and dust over the short term, but these will be minimised through best construction practices. There are no AQMAs within proximity of the scheme. Operation of the scheme will not be associated with any air emissions.	Small	High	Short-term	temporary	Low	Medium (adverse)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	The scheme requires construction of a new WTW, pumping stations and approximately 30km new pipeline. Construction of these assets would result in greenhouse gas emissions. Operation of the scheme will require modest additional annual energy consumption associated with pumping and additional water treatment chemical use, with a negligible adverse impact on greenhouse gas emissions.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute towards securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The pipeline route is within 1km of three Scheduled Monuments, as well as 120 listed buildings (three of which are Grade 1 listed;. All these assets are anticipated to experience reductions in the quality of their setting as a result of the construction, resulting in minor adverse effects and therefore mitigation may be necessary. Construction work has the potential to disturb unknown buried assets. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets. During operation there may be small changes to the setting of these assets from the new small permanent structures on the surface, but this impact is anticipated to be negligible. No beneficial effects are anticipated.	Small	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Moderate (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The option is within 5km of National Parks as well as an ANOB. Construction of the scheme will present minor temporary effects on visual amenity within these areas. Mitigation measures should minimise this effect, including sensitive design such that they do not detract from local distinctiveness (the majority of the scheme infrastructure will be buried after construction).	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R12 East Yorkshire Groundwater Option 1**
Scheme description	Development of a scheme to maximise the potential for export to the Yorkshire Water Grid system via a pumping station. This scheme involves abstraction from the underutilised abstraction. The licenced limit is currently underutilised by 20Ml/d, although it is assumed that the maximum yield is likely to be 8Ml/d. There is currently an embargo on future abstraction in this aquifer to prevent further saline intrusion. The scheme will involve installation of a pumping station to boost flows up to an existing pumping station from the ring main. This would reduce the overall pressure in the ring main, increasing the transfer capacity of the northern section of the ring main, by allowing more water (up to an additional 8 Ml/d) to be pumped from the WTW into the ring main. The scheme would provide a yield of 8Ml/d. Implementation time is anticipated to be between 3 and 5 years.

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Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA assessed the potential impacts of the scheme on the designated sites. The HRA found that most of the sites concerned were not hydrologically linked to the abstraction. One SAC may be hydrologically linked but as abstraction rates are low and the site is outside of the Source Protection Zone, no Likely Significant Effects are identified. The Selby pumping station scheme is near an SSSI IRZ. Consultation with Natural England will be required regarding mitigation for potential impacts on this SSSI during project planning. There are no other conservation designations within proximity of the proposed scheme. There may be some short term, temporary impacts on non-designated habitats arising from the construction of the new pumping station but these should be mitigated by best practice construction methods. Operation of the scheme is unlikely to have any adverse effects on biodiversity, flora or fauna.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing groundwater flows. However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between sites or catchments.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity	An estimated 0.52 biodiversity units would be lost during construction of the new required infrastructure; this will provide negligible beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Negligible beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The construction of the new pumping station may have a temporary, minor, short term (6 months) adverse impact upon residents located near to two villages, particularly residents in close proximity to the construction site, due to nuisance from noise, dust and vibration. An increase of 8 Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Small (adverse) Medium (beneficial)	Moderate (adverse) High (beneficial)	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction activity will also have a minor, temporary adverse impact on informal recreation due to temporary disruption to some recreational facilities such as public paths and rights of way in the short term. These effects will be mitigated as far as possible through best practice construction measures. Effects on access to or use of the water environment for recreation, tourism and navigation are expected to be negligible. Operation of the scheme is not anticipated to have any adverse impacts upon access to recreation and the water environment in the local area.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (new pumping station). However the scheme will make good use of a large part of existing infrastructure. Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping.	Small	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Pollution risks from construction activity should be mitigated by best practice methods. The abstraction would be from a WFD groundwater body, which is classified as good status for dependent surface water body status, GWDTE's test and water balance, but poor for saline intrusion and chemical status. The WFD assessment identified that linked effects with potential increased saline intrusion are unknown and that further investigation is required to provide further certainty regarding the WFD assessment conclusions. Operation of the scheme will be within existing abstraction limits, but the increase in actual abstraction will put some minor additional pressure on the groundwater quality in the aquifer.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be from a WFD groundwater body, which is classified as good status for water balance, impact on rivers and impact on wetlands. Operation of the scheme will be within existing abstraction limits, but the increase in actual abstraction will put some minor additional pressure on the groundwater levels within the aquifer as the abstraction would result in an 30% increase to the current rate. The impacts of additional abstraction are unknown and further investigation is required. There is potential for flow reduction, however the WFD assessment identifies a negligible impact on flows and no risk of deterioration.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Zone 1. Areas within Flood Zone 1 have a low probability of flooding, so mitigation is not likely to be required. There will be little above ground land-take in Flood Zone 1 once the scheme is operational (0.1ha), therefore the permanent effects of the new pumping station on flood storage are assessed as negligible, accounting for additional pressures due to climate change. The additional abstraction will have a negligible effect on flood flows.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability, and reduce per capita consumption, except in the short-term during the construction phase.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the pumping station will have a short term, temporary but negligible effect on the quality and quantity of the soils in the area. The construction of the new pumping station will require permanent land take of 0.1ha most likely from Grade 3 agricultural land. Given the small-scale of the pumping station, no long-term adverse effects are anticipated on soils, geology or overall land-use management.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air pollutant emissions and dust over the short term (6 months), but these will be minimised through best construction practices. There are no AQMAs within proximity of the scheme.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction work and vehicle movements associated with construction phase will give rise to temporary GHG emissions over the short term (6 months), but these will be minimised through best construction practices. Capital carbon emissions associated with the scheme are estimated to be 239 tCO2. Operation of the scheme will require some additional annual energy consumption associated with increased groundwater pumping and minor additional water treatment chemical use, with a minor adverse impact on greenhouse gas emissions.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a small contribution to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are no listed assets or designated features within proximity to the scheme. Construction work has the potential to disturb unknown buried assets, however this would be further evaluated by desk studies and other investigations prior to construction. A watching brief, surveys and investigation would be implemented if required during construction, to reduce the risk of adverse impact to any unknown heritage assets.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There may be small scale, temporary adverse effects locally on visual amenity due to construction activity near residential areas. Given the small-scale of the pumping station, permanent visual impact is likely to be mitigated by screening measures. A minor adverse impact has been assessed as detailed external design features and landscaping are unknown.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Moderate (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	R13 East Yorkshire Groundwater Option 2
Scheme description	Construction of a new abstraction from the underlying Sherwood Sandstone with a short piped connection to the nearby covered reservoirs. The scheme will require drilling construction, pump installation, a short pipeline connection to the adjacent treatment works and the associated mechanical and electrical equipment. A contact tank would also be required. Abstraction volumes of 6Ml/d average (9Ml/d maximum). Implementation time is anticipated to be 1 year.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening of this scheme assessed the potential impact on designated sites. Hydrological impacts of the proposed scheme are unlikely to influence these sites. Based on the locations of the Source Protection Zones, it is unlikely that drawdown at the site would impact upon habitat in the SAC. Also, due to the superficial material surrounding it is unlikely that the surface water and groundwater are sufficiently linked to cause impacts upon the SAC, SPA or Ramsar. The site is a sufficient distance from to constitute an impact. No likely significant effects are anticipated. The new abstraction would be located next to an existing reservoir, which is surrounded by, a lowland acid oak woodland with ornithological interest. There is existing access to the site. The construction of the new borehole would be likely to cause temporary impacts related to noise, vibration and dust; however, it is expected that these impacts on the neighbouring woodland would be mitigated through best practice construction and timing the construction to avoid adverse impacts on bird populations. The exact route of the pipework connecting the new borehole to the water treatment works and reservoir is unknown and there is a risk of adverse impact on the ancient woodland through disturbance to root structure during excavation activities. At this stage a moderate adverse effect has been assessed pending further design details and method statements to demonstrate whether mitigation measures can avoid impact on the ancient woodland. Once operational, the scale of abstraction is relatively small in comparison to overall abstraction from the aquifer, but the abstraction is from a WFD groundwater body which is classified as having a poor impact on surface waters. The additional actual abstraction is assessed as having the potential for no greater than minor adverse effects on aquatic flora and fauna.	Small	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing groundwater flows. However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction. It is unlikely to affect the water balance on a groundwater body scale, however further investigation is required.	Small	Low	Long-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between sites or catchments.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 0.4 biodiversity units would be lost during construction of the borehole and piped connection; this will provide negligible beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Negligible beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The construction of the pipeline may have a temporary, minor, adverse impact upon residents in close proximity to the construction site, due to nuisance from noise, dust and vibration. An increase of 6 Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Small (adverse) Medium (beneficial)	Moderate (adverse) High (beneficial)	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction work may temporarily impact those who use the woods for informal recreation and ornithology through disturbance from noise, dust and vibration. The construction activity may also have some temporary impact upon recreation due to potential disruption to public paths and rights of acces and to community facilities. These effects would be mitigated as far as possible through best practice construction measures. Once operational, there is unlikely to be any permanent effects on recreation, human health or access to the environment.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy, or encourage a reduction in per capita consumption. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (new pumping station and pipeline). However the scheme will make good use of a large part of existing infrastructure. Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Pollution risks from construction activity will be mitigated by best practice methods. Once operational, the abstraction is from a WFD groundwater body which is classified as having poor chemical status and poor status in relation to saline intrusion - the assessed impact on these two elements is uncertain. The scheme has been assessed as having an uncertain impact on fish (currently moderate), macro-invertebrates (currently good), macrophytes and Phytobenthos (not previously assessed). The scheme is unlikely to result in a deterioration in chemical status of this water body.	Medium	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction is from a WFD groundwater body, which is classified as having poor quantitative status due to depressed groundwater levels. Although abstraction would be within existing licence limits, the increase in actual abstraction could have a moderate adverse effect, although not sufficient to lead to deterioration in WFD status to "bad". The previous abstraction the site used the same quantities as this proposed scheme, therefore it is unlikely to affect the water balance on a groundwater body scale, however further investigation is required.	Medium	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zone 2. As such temporary mitigation measures may be required to alleviate flood risk. There will be little above ground land-take in Flood Risk Zone 2 once the scheme is operational (0.005ha), therefore the permanent effects of the new abstraction on flood storage are assessed as negligible. The additional abstraction will have a negligible effect on flood flows, taking into account additional pressures due to climate change.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the new site and pipeline will have a short term, temporary but negligible effect on the quality and quantity of the soils in the area. Given the small-scale, no long-term adverse effects are anticipated on soils, geology or overall land-use management.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air pollutant emissions and dust over the short term (6 months), but these will be minimised through best construction practices. There are no AQMAs within proximity of the scheme.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction work and vehicle movements associated with construction phase will give rise to temporary GHG emissions over the short term (6 months), but these will be minimised through best construction practices. Construction is anticipated to result in emission of 1,269t/CO2. Operation of the scheme will require some additional annual energy consumption associated with increased groundwater pumping with a minor adverse impact on greenhouse gas emissions.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a small (6M/l/d) contribution to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are no listed assets or designated features within proximity to the scheme. Construction work has the potential to disturb unknown buried assets, however this would be further evaluated by desk studies and other investigations prior to construction. A watching brief, surveys and investigation may be implemented during construction if required to reduce the risk of adverse impact to any unknown heritage assets.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There may be small scale, temporary adverse effects locally on visual amenity due to construction activity within a woodland setting. However given the small-scale of the borehole, permanent visual impact is unlikely and would be mitigated by screening and design measures.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	**R17 Reuse abandoned third party groundwater source Option 2**
Scheme description	This scheme is the second of the four third party borehole schemes. It requires acquisition, which abstracts from the Carboniferous Millstone Grit aquifer and is located approximately 4.9km from the WTW. Yorkshire Water have assumed the licenced quantity previously held by the existing owner would be available. In the absence of a detailed investigation it is also assumed that the site will require a full refurbishment. The current scheme includes rehabilitation; installing new pumping equipment and headworks; and installing new pipework between the abstraction and WTW. It is assumed that the following works will be required to re-commission the asset: • Initial asset inspection; down-hole CCTV survey/ geophysical survey; pumping test and water quality tests to ascertain the condition and performance of the borehole. • Based on results of the asset inspection, rehabilitate the borehole as required. • Install new infrastructure (submersible pumps, rising main, headworks, sample taps, flow meters, M&E, telemetry etc.). • Construct a new pipeline (approximately 6 km of pipework). The scheme will use the existing processes and infrastructure at the WTW for water treatment and distribution. The scheme would provide a yield of 2.5Ml/d

SEA topics and objectives			**Assessment of option**							
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Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA assessed the possible effects of the scheme upon the European designated sites. The site is located approximately 9.5 km from the SAC and SPA and the zone of influence is unlikely to result in any impacts on the designated habitats from groundwater abstraction. It has been assumed that the existing licence was included in the Review of Consents undertaken by the Environment Agency. The HRA concluded that there will be no likely significant effects on any of these sites. Pipeline construction would be within proximity to an the Leeds-Liverpool Canal SSSI, but it is sufficiently distanced from it the canal not to have any adverse impacts. However, the scheme is within the IRZ for this SSSI, and consultation with NE will be required regarding mitigation during project planning. An LNR is within 1km of the asset but is not affected by the pipeline route. Bringing the borehole abstraction back into use may have a minor adverse impact on the flow in the local river Meanwood Beck, which may in turn impact on the downstream edge of the LNR. However, it is unclear whether this stream is in hydrological connectivity to the Millstone Grit aquifer from which the water will be abstracted. Further investigation would be required. The pipeline also intersects two ancient woodlands (Swaine Wood and Hawksworth Wood) and it is possible that the ancient woodlands could be impacted upon permanently by the pipeline construction due to irreversible impacts on tree root structures. Pipeline route optimisation would be undertaken during detailed design should this scheme proceed, and ancient woodland would be avoided. The construction requirement of the various scheme assets, including pipeline, borehole rehabilitation and associated infrastructure development, may cause temporary (< 12 months), minor effects on non-designated habitats over a small area (<3 ha). These effects will be mitigated as far as possible and undertaken at an appropriate time of year to minimise possible disruption to flora and fauna.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing surface water flows. However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	An estimated 63 biodiversity units would be lost during construction of the new borehole infrastructure and pipeline; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Natural Improvement Area.	Small	Moderate	Long-term	Permanent	Low	Low	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Temporary minor nuisance from noise, dust and vibration is likely during construction as the pipeline route runs through mainly urban areas. Once the pipeline has been constructed, the scheme will have no long term impact upon population, recreation and human health. An increase of 2.5Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Medium (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Medium (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	There are public rights of way and a number of roads and footpaths which the pipeline route runs adjacent to and crosses, that could be temporarily affected during the construction phase. These effects will be mitigated as far as possible, such as by footpath diversions, appropriate timing of the works and liaison with relevant stakeholders. The construction work may also result in temporary disruption to other recreational activities including access to the water environment and usage of the number of open spaces and parks that the pipeline will pass through over the short term. Operation of the scheme is not anticipated to have any adverse impacts upon access to recreation and the water environment in the local area.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (5.85 km pipeline, pipeline crossings and borehole asset upgrade). The scheme will make use of some existing infrastructure. Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for treatment chemicals and power for pumping.	Medium	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The pipeline construction will cross and come into proximity of a local river the River Aire. Short-term construction impacts will be mitigated by best practice methods to prevent pollution of any watercourses. The additional groundwater abstraction is unlikely to have more than a negligible impact on water quality in the Meanwood Beck or downstream into the River Aire. The WFD assessment concluded the scheme is unlikely to result in a deterioration in the chemical status of the of the WFD groundwater body, although further investigation is required. No water quality risk to surface water bodies are identified.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Operation of the scheme would have a negligible impact on flows in the River Aire as the abstraction represents only 1% of Q99 flows at the nearby Armley flow gauge. Assuming there is hydrological connectivity to the Meanwood Beck, the impact of the small abstraction on baseflows is likely to be negligible. However, further investigation is required. No risk of deterioration of the WFD water body are identified.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zones 2 and 3. There will no above ground land-take in Flood Risk Zones 2 and 3 once the scheme is operational; therefore the impact on flooding is negligible. The additional abstraction will have a negligible effect on flood flows in Meanwood Beck or the River Aire taking into account additional pressures due to climate change.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme would not have direct effects on water efficiency. The scheme does not directly contribute towards improving the awareness of water sustainability and its true value.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The construction of the pipeline will involve temporary land take and disruption to soils and land-use along the pipeline route (which includes some Grade 1 Agricultural land and Green Belt) over a medium area (6km pipeline, 0.58 ha over 6-12 months). As the pipeline will be buried and land reinstated, this will have no long-term adverse effects on soils. No long-term adverse effects are anticipated on geology or overall land-use management.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with the construction phase will give rise to temporary air emissions and dust over the medium term, these will be minimised through construction best practices. The scheme is within proximity to 1 AQMA site (over 1km) therefore mitigation measures will need to be put in place to minimise air pollution during both construction and operation.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction work and vehicle movements associated with the construction phase will give rise to temporary GHG emissions over the medium term, these will be minimised through construction best practices. Operation of the scheme will require some very small additional annual energy consumption associated with increased groundwater pumping and minor additional water treatment chemical use, with negligible impact on greenhouse gas emissions. It is anticipated that construction will result in 987.46 tonnes of carbon.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a negligible beneficial contribution (2.5Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are 5 listed buildings within 100m of the proposed pipeline (5 Grade II and 1 Grade II*). There are also 3 Scheduled Ancient Monuments within 1km of the pipeline route. However, the scheme will avoid the listed and scheduled assets. The construction of the scheme will involve excavation which could affect unknown buried assets, however this would be further evaluated by desk studies and other investigations prior to construction. A watching brief, surveys and investigation may be implemented during construction if required, to reduce the risk of adverse impact to any unknown heritage assets.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	Elements of the pipeline will be constructed in areas of greenbelt land and adjacent to a local river the River Aire leading to temporary adverse impact upon the quality of the visual landscape during construction. However, as the pipeline will be buried, there will be no lasting adverse impact upon the landscape and visual amenity.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R18 Reuse abandoned third party groundwater source Option 3**
Scheme description	This scheme requires acquisition of a site, which abstracts from the Carboniferous Millstone Grit aquifer and is located approximately 4.15km from the WTW. It is assumed the licenced quantity previously held by the existing owner would be available, which is 1.272Ml/d. In the absence of a detailed investigation it is also assumed that the borehole will require a full refurbishment. The current scheme includes rehabilitation; installing new pumping equipment and headworks; and installing new pipework between the asset and the WTW. It is assumed that the following works will be required to re-commission the asset: • Initial asset inspection; CCTV survey/ geophysical survey; pumping test and water quality tests to ascertain the condition and performance. • Based on results of the asset inspection, rehabilitate as required. • Install new infrastructure (submersible pumps, rising main, headworks, sample taps, flow meters, M&E, telemetry etc.). • Construct a new pipeline to WTW (approximately 4.9km of pipework). The scheme will use the existing processes and infrastructure at the WTW for water treatment and distribution. The scheme would provide a yield of 1.27Ml/d

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA assessed the potential impacts of the scheme on the European designated sites. The hydrological impacts of concern for the SAC and SPA relate to surface erosion and gully formation. The proposed abstraction is unlikely to further contribute to these hydrological threats. The site is also located near a large town, and is approximately 8km from a European Site. The site is also sufficiently distanced from the required infrastructure for impacts on bird species to be unlikely. The proposed pipeline is located outside the IRZ for construction activities. It has been assumed that the existing licence (of a 1.272Ml/d abstraction) was included in the Review of Consents undertaken by the Environment Agency. Therefore the HRA concluded no likely significant effects. The pipeline is approximately 6km from an SSSI, but is outside the IRZ for this site. The pipeline route runs adjacent to an area of priority habitat lowland dry acid grassland. Consultation with Natural England regarding detailed design and mitigation would be required during project planning to ensure impacts on this habitat are avoided. There is one LNR/LWS within proximity (125m) to the scheme but this is not hydrologically connected to the borehole. Given that the pipeline route is located within 100m of the designated site, there is a risk of some temporary impacts caused by dust, noise and vibration; however these will be mitigated by standard best practice construction methods. Mitigation will also help to ensure no greater than negligible temporary adverse effects on non-designated habitats. Operation of the scheme is unlikely to have any effects on biodiversity or ecology.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing surface water flows. However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	An estimated 31 biodiversity units would be lost during construction of the borehole infrastructure and pipeline; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Medium	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	High (adverse) Medium (Beneficial)	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Temporary, minor nuisance from noise, dust and vibration are likely to affect residents along the pipeline route during construction. An increase of 1.27 Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction work may result in temporary disruption to informal recreational activities and access along the pipeline route. There are a number of roads, railways, footpaths and public accesses that may be disrupted due to the pipeline construction works, and access to the water environment could be affected. These effects will be mitigated as far as possible through liaison between Yorkshire Water, the Highways Agency, Network Rail and local authorities. Once the pipeline has been constructed, the scheme will have no long term impact upon population, recreation and human health.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (4.9 km pipeline and a borehole upgrade). The scheme will make use of some existing infrastructure. Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for treatment chemicals and power for pumping.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The pipeline construction will cross and come into proximity of a local river and other minor watercourses. Short-term construction impacts should be mitigated by best practice methods to prevent pollution of any watercourses. The additional groundwater abstraction is unlikely to have more than a negligible impact on water quality. The WFD assessment concluded no risk of deterioration in chemical status at a groundwater body scale, although local impacts may be expected.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The WFD assessment concluded there are potential minor flow reduction impacts - the effect on fish and macro-invertebrates is uncertain and further investigation is required. The previous abstraction at this location abstracted the same quantities as this proposed scheme therefore it is unlikely to affect the water balance on a groundwater body scale however, further investigation is required.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zones 2 and 3. As such temporary mitigation measures may be required to alleviate flood risk. There will no above ground land-take in Flood Risk Zones 2 and 3 once the scheme is operational; therefore the impact on flooding is negligible. The additional abstraction will have a negligible effect on flood flows taking into account additional pressures due to climate change.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme would not have direct effects on water efficiency. The scheme does not directly contribute towards improving the awareness of water sustainability and its true value.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The construction of the pipeline will involve temporary land take and disruption to soils and land-use along the pipeline route over a small area (0.48 ha for 6-10 months). As the pipeline will be buried and land reinstated, this will have no long-term adverse effects on soils. No long-term adverse effects are anticipated on geology or overall land-use management.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with the construction phase will give rise to temporary air emissions and dust over the medium term, these will be minimised through construction best practices.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction work and vehicle movements associated with the construction phase will give rise to temporary GHG emissions over the medium-term, these will be minimised through construction best practices. Operation of the scheme will require some very small additional annual energy consumption associated with increased groundwater pumping and minor additional water treatment chemical use, with negligible impact on greenhouse gas emissions. It is anticipated that construction will result in emission of 239 tonnes of carbon.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a small beneficial contribution (1.27Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are a significant number of listed buildings within proximity to the scheme pipeline (majority of them are listed residences some of which are on the streets along which the pipeline route will run adjacent to). Excavation and construction required by the scheme has the potential to adversely impact these assets, although further assessment will be carried out prior to construction and mitigation measures such as sensitive routing of the pipeline should be sufficient to ensure that no long term impacts occur. A Registered Park and Garden is within 1km proximity of the borehole and pipeline. It is also possible that the excavation for the pipeline could affect unknown buried heritage assets. If required, a watching brief, surveys and investigation may be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets.	Small	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are no designated landscapes within proximity to the scheme. Construction of the pipeline may have negligible, medium term, temporary impacts upon local non-designated landscapes. As the pipeline will be buried, there will be no lasting adverse impact upon the landscape and visual amenity.	Small	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	R19 Reuse abandoned third party groundwater source Option 4
Scheme description	This scheme requires acquisition of an asset , which abstracts from the Carboniferous Millstone Grit aquifer and is located approximately 3.7km from the WTW. It is assumed the licenced quantity previously held by the existing owner would be available, which is 1.296Ml/d. In the absence of a detailed investigation it is also assumed that the site will require a full refurbishment. The current scheme option has been costed to include rehabilitating; installing new pumping equipment and headworks; and installing new pipework to WTW. It has been assumed that the following works will be required to re-commission the asset: • Initial asset inspection; CCTV survey/ geophysical survey; pumping test and water quality tests to ascertain the condition and performance. • Based on results of the asset inspection, rehabilitate as required. • Install new infrastructure (submersible pumps, rising main, headworks, sample taps, flow meters, M&E, telemetry etc.). • Construct a new pipeline between the site and WTW (approximately 3km of 250mm PE pipework). The scheme will use the existing processes and infrastructure at the WTW for water treatment and distribution. The scheme would provide a yield of 1.29Ml/d.

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA assessed the potential impacts of the scheme on the European designated sites. The hydrological impacts of concern for the SAC and SPA relate to surface erosion and gully formation and not abstraction. The proposed abstraction is unlikely to further contribute to hydrological threats associated with the sites. The low volumes of abstraction are unlikely to result in sufficient drawdown to result in any impact on the sites. The site is also sufficiently distanced from the required infrastructure for impacts on bird species to be unlikely. The proposed pipeline is located outside the IRZ for construction activities. It has been assumed that the existing licence (of a 1.296Ml/d abstraction) was included in the Review of Consents undertaken by the Environment Agency. The HRA concluded no likely significant effects on this site. There is one LNR/LWS within proximity to the scheme, but as the scheme pipeline route is almost 1.5km from the designated site, it is not anticipated that there will be any adverse impacts upon it. The LNR is not hydrologically connected to the boreholes. There is a risk of some minor temporary impacts caused by dust, noise and vibration; however these will be mitigated by standard best practice construction methods. Mitigation will also help to ensure no greater than negligible temporary adverse effects on non-designated habitats. Operation of the scheme is unlikely to have any effects on biodiversity or ecology.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing surface water flows. However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS.	Small	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	An estimated 13 biodiversity units would be lost during construction of the borehole infrastructure and pipework; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Medium	Low	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Temporary, minor nuisance from noise, dust and vibration is also likely to affect residents along the pipeline route during construction. An increase of 1.29 Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Small (adverse) Medium (beneficial)	Moderate (adverse) Moderate (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction work may result in temporary disruption to informal recreational activities and access along the pipeline route. There are a number of roads, railways, footpaths and public accesses that may be disrupted due to the pipeline construction works with some traffic congestion likely. These effects will be mitigated as far as possible through liaison between Yorkshire Water, the Highways Agency, Network Rail and local authorities. However, the construction and operation of the scheme is not expected to have an impact on access to water-related recreation and environment.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (~3km pipeline and a borehole upgrade). The scheme will make use of some of the existing infrastructure. Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for treatment chemicals and power for pumping.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The pipeline construction will cross and come into proximity of a local river, and other minor watercourses. Short-term construction impacts should be mitigated by best practice methods to prevent pollution of any watercourses. The additional groundwater abstraction is unlikely to have more than a negligible impact on water quality. The WFD assessment concluded no risk of deterioration in chemical status at a groundwater body scale, although local impacts may occur.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The WFD assessment concluded the previous abstraction at this location abstracted the same quantities as this proposed scheme therefore it is unlikely to affect the water balance on a groundwater body scale, however further investigation is required. There is potential for minor flow reduction impacts for a dependent water body.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zones 2 and 3. As such temporary mitigation measures may be required to alleviate flood risk. There will no above ground land-take in Flood Risk Zones 2 and 3 once the scheme is operational; therefore the impact on flooding is negligible. The additional abstraction will have a negligible effect on flood flows taking into account additional pressures due to climate change.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme would not have direct effects on water efficiency. The scheme does not directly contribute towards improving the awareness of water sustainability and its true value.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The construction of the pipeline will involve temporary land take and disruption to soils and land-use along the pipeline route over a small area (0.3 ha for 3-6 months). As the pipeline will be buried and land reinstated, this will have no long-term adverse effects on soils. No long-term adverse effects are anticipated on geology or overall land-use management.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with the construction phase will give rise to temporary air emissions and dust over the short term, these will be minimised through construction best practices.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction work and vehicle movements associated with the construction phase will give rise to temporary GHG emissions over the short term, these will be minimised through construction best practices. Operation of the scheme will require some very small additional annual energy consumption associated with increased groundwater pumping and minor additional water treatment chemical use, with negligible impact on greenhouse gas emissions. It is anticipated that construction would result in emission of 440 tonnes of carbon.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a small beneficial contribution (1.29Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are more than 30 listed assets, all Grade II, within proximity to the scheme pipeline route. Excavation and construction required by the scheme has the potential to adversely impact these assets, although further assessment will be carried out prior to construction and mitigation measures such as sensitive routing of the pipeline should be sufficient to ensure that no long term impacts occur. It is also possible that the excavation for the pipeline could affect unknown buried heritage assets. If required, a watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets.	Small	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are no designated landscapes within proximity to the scheme. Construction of the pipeline may have short term, temporary impacts upon local non-designated landscapes. As the pipeline will be buried, there will be no lasting adverse impact upon the landscape and visual amenity.	Small	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	**R29 Reservoir De-silting**
Scheme description	This option explores the potential of de-silting reservoirs in order to restore lost storage capacity. A survey of Yorkshire Water upland reservoirs in the early 1990s indicated that siltation was quite serious in the Pennine reservoirs (Mott MacDonald, 1994) and the yield of some reservoirs was revised downwards due to siltation problems. In 1995, a study of 25 reservoirs was carried out in the Yorkshire area to estimate the benefits of implementing a reservoir desilting scheme. A cost was then estimated based on these figures. As the waste would go to landfill, a cost of 60% of the unit cost per cubic metre of silt removed was added at that time to cater for the landfill tax. For WRMP 2019 Yorkshire Water reviewed the reservoirs that should be desilted and recalculated the yield benefit. The review concluded there is still potential benefit from draining and removing sediment from 25 reservoirs, listed below. Data suggests that the total capacity of reservoir yield can be increased by 11Ml/d through desilting 25 reservoirs: The scheme would provide a yield of 11Ml/d. The implementation time is anticipated to be 7 years.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA for this scheme took into account potential impacts of different reservoirs within this option upon a range of European sites depending on the reservoir location: The HRA found that there is uncertainty as to the exact method to be deployed for desilting (reservoir drawdown or dredging) operation. If extensive drawdown is required, the scheme has the potential to impact upon sites. Potential impacts relate to temporary loss of surface water area for waterfowl, adverse impact on reservoir water quality and possible draining effects on any marginal designated habitat. Temporary disturbance to these European sites during the desilting works should be mitigated through standard mitigation measures and timing of the activities to avoid bird breeding seasons. There are six SSSIs within proximity to one or more of the scheme reservoirs as well as a Nature Improvement Area - these sites may similarly be temporarily impacted from extensive reservoir drawdown. Desilting works have the potential to temporarily adversely affect water quality both within the reservoir and in the downstream watercourses from elevated turbidity in the compensation flow release water. This will be mitigated by best practice methods (e.g. settling pools and use of straw bales to filter out sediments), but there may be a minor impact on ecology as a result of minor adverse impact on water quality.	Medium	Low	Long-term	Temporary	Moderate (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme will have a negligible effects in respect to the improvement natural capital and ecosystem services	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during the desilting process - mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of the works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between sites or catchments.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	This option would not require the construction of any new water resources infrastructure and therefore would not result in habitat loss. There are therefore no anticipated opportunities for habitat creation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The works may also result in temporary minor nuisance from noise and vibration. These effects will be mitigated as far as possible through best practice measures. An increase of 11 Ml/d in deployable output will help to maintain the supply-demand balance although there will be a high cost relative to benefit provided which needs to be recognised when considering overall affordability of water bills.	Medium (adverse) Medium (beneficial)	Moderate (adverse) Moderate (beneficial)	Long-term (adverse) Long term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Almost all the reservoirs have some form of pathways, cycleway, public rights of way or country parks bordering them or within very close proximity to them making it highly likely that they will be disrupted in some way during the operation of the scheme. These impacts will be mitigated as far as possible through pathway diversions and other similar actions, but impact on water-based recreation is likely to be curtailed temporarily and visitors are likely to be discouraged from informal recreation during the works. Operation of the scheme will not have any adverse impacts on water-related recreation or environment.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand. Scheme construction will require safe disposal of sediment extracted from the reservoirs, but wherever possible this will be recycled/re-used for other beneficial purposes (e.g. compost or mixed in digesters for energy generation) rather than taken to landfill. Once operational, minimal material inputs will be required, except for some minor additional water treatment chemicals. The scheme will make use of existing infrastructure.	Medium (adverse) Medium (beneficial)	Moderate (adverse) Moderate (beneficial)	Long-term (adverse) Long term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	This scheme includes the de-silting of a range of different reservoirs using various de-silting methods. The risks associated with this scheme therefore would be specific to the reservoir and method chosen. Any option to de-silt would be subject to careful planning and further investigation therefore the reservoirs selected in this option may reduce if environmental impacts are identified. As the method statements for the de-silting are not available, the types of impacts cannot be assessed and WFD compliance cannot be confirmed. Further details and investigational work are required.	Medium	Low	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This scheme includes the de-silting of a range of different reservoirs using various de-silting methods. The risks associated with this scheme therefore would be specific to the reservoir and method chosen. Any option to de-silt would be subject to careful planning and further investigation therefore the reservoirs selected in this option may reduce if environmental impacts are identified. As the method statements for the de-silting are not available, the types of impacts cannot be assessed and WFD compliance cannot be confirmed. Further details and investigational work are required.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The removal of silt will increase reservoir storage capacity across many Pennine river catchments - however, it is unlikely to result in increased flood storage and flow attenuation.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency or encourage a reduction in per capita consumption, and presents no real opportunity to increase awareness of water sustainability except in the short-term during the construction phase.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	There is no land take, permanent or temporary associated with this scheme. The scheme will not have any adverse effects on land-use management, soils or geology.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	The desilting works will give rise to some minor dust and emissions over the medium-term, but these will be minimised through best practice methods to reduce air pollutants, particularly on the Sheffield Citywide AQMA.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	The desilting works will give rise to some minor GHG emissions over the medium term, but these will be minimised through best practice methods to reduce emissions. Operation of the scheme will require some additional annual energy consumption associated with minor additional water treatment chemical use, with a minor adverse impact on greenhouse gas emissions.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a contribution (11Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There may be listed buildings within proximity to one or more of the scheme reservoirs, but adverse effects should be avoided by best practice mitigation methods. There is minor risk to disturbance or damage to both known and unknown submerged heritage assets as many of the reservoirs are located in valleys that were once occupied by small hamlets and agricultural assets. A watching brief, surveys and investigations will be necessary to help mitigate these impacts.	Medium	Low	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	If desilting requires extensive drawdown of the reservoirs, there is likely to be temporary moderate adverse effects on landscape and visual amenity given the setting of these reservoirs, some of which are located within or in visual proximity to National Parks, as well as AONB. There will be no permanent effects on landscape and visual amenity.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	**R34 River Calder Abstraction Option 1**
Scheme description	The option involves a new abstraction. Water will be abstracted and transferred via a 3km pipeline to the WTW. The WTW currently treats approximately 45Ml/d on average, increasing to about 48Ml/d peak. The capacity of the works is 55Ml/d, which leaves insufficient capacity to treat the entire yield from this scheme. However, existing raw water sources supplying the WTW could be re-routed to allow the abstraction to be treated at the WTW or the river abstraction could be used to conserve reservoir supplies. An alternative option would be to expand the WTW. Space for further development is extremely limited and acquisition of land could be difficult. The Environment Agency has confirmed that current available resource is 10Ml/d with a local hands-off flow condition of 68Ml/d. The scheme would provide a yield of 9.29Ml/d average (10Ml/d most days).

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA assessed the potential impact of this scheme. The HRA screening concluded that there would be no likely significant effects on these sites. There are five LNRs and seven LWSs within 3km of the scheme, however as the closest of those is over 1.5km from the pipeline route it is not anticipated that any adverse impacts upon these will arise from construction activities assuming best practice construction methods are employed to minimise noise and dust generation. Minor adverse effects might result from the construction requirement of the various scheme assets, including the pipeline and river intake and outfall. This may cause temporary effects on non-designated habitats over a small area (<2 ha). These effects will be mitigated as far as possible and works will be scheduled for an appropriate time of year. It is assumed the abstraction licence would include hands off flow conditions to prevent abstraction at river flows that would be detrimental to the aquatic environment and only minor impacts to fish, macro-invertebrate, macrophytes and phytobenthos are anticipated.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor Adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have adverse effects on fresh water provision services through a new abstraction, by influencing surface water flows.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor Adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Invasive species may be present at construction sites. There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between catchments.	Small	Low	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	An estimated 0.21 biodiversity units would be lost during construction of the new abstraction and pipeline; this will provide negligible beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Small	Low	Long-term	Permanent	Low	Low	None	Negligible beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme construction phase is likely to result in temporary nuisance from noise, dust and vibration. These effects will be most notable where the pipeline route comes into close proximity to population centres. These will be mitigated as far as possible through best construction practices. A large proportion of the pipeline route will pass through heavily built areas (for ~1km) with moderate population density therefore it is expected that there will be some moderate-scale impacts on well-being and health will occur. An increase of 10Ml/d in deployable output will help to maintain the supply-demand balance although there will be a high cost relative to benefit provided which needs to be recognised when considering overall affordability of water bills.	Medium (adverse) Small (beneficial)	High (adverse) High (beneficial)	Long-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Moderate adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	There are no national trails or AONB within proximity to the scheme. Minor adverse effects might occur during the pipeline construction phase of the scheme due to the location of several recreational facilities, public rights of way and access roads which may be disrupted. However, construction and operation of the scheme is unlikely to affect access to water-related recreation and environment.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme. Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for treatment chemicals and power for pumping.	Medium	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	WFD screening assessed impacts on two surface water bodies. Construction of the intake will be managed by good practice construction methods and any risk to the water body during construction is assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Pollution risks from construction activity will be mitigated by best practice methods. The reduced flow in the River is not considered likely to result in a deterioration in chemical status.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	WFD screening identified the greatest proportional change in the river flow regime would be reductions in the moderate flow to low flow conditions from the abstraction with very low flows protected by a hands-off flow condition. Indicative flows derived from gauged data indicate ~5% reduction in year round low flows (Q90) and 2% reduction in moderate flows (Q50) which is considered a minor flow reduction. The abstraction would take place from a water resource management unit which has sufficient water available to support this proposed rate of abstraction (with potential hands-off flow conditions to protect the environment). Impacts on sustainable abstraction and water resources are therefore assessed as minor adverse. This is subject to further discussion with the Environment Agency.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zone 3. As such temporary mitigation measures may be required to alleviate flood risk. However, there will be very little above ground land-take in Flood Risk Zones 3 as the pipeline will be buried and the above ground assets are small in scale and within an existing site, with negligible impact on flood storage. Taking into account additional pressures due to climate change, the additional abstraction will not have any effects on flood flows in the River.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor Adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The pipeline will involve temporary land take and disruption to soils along the pipeline route (which includes a mixture of Grade 4 Agricultural land, brownfield and urban land classifications) during construction only. As the pipeline will be buried and land reinstated, this will have no long-term adverse effects on soils. Land-take from other new assets will be small-scale, with negligible permanent impacts on soils, geology or land-use. No long-term adverse effects are anticipated on geology, soils or overall land-use management.	Medium	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary emissions and dust over the medium-term, but these will be minimised through best construction practices. There are 3 AQMAs in proximity to the scheme, and project traffic will be routed away from these areas where possible.	Medium	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor Adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction work and vehicle movements associated with construction phase will give rise to temporary GHG emissions over the medium-term, but these will be minimised through best construction practices. Construction of the scheme will result in emission of 1,533 t of carbon. Operation of the scheme will require some additional annual energy consumption associated with increased pumping and water treatment chemical use, with a minor adverse impact on greenhouse gas emissions.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor Adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a contribution (10Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Long-term	Permanent	Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are 56 listed assets within 1km of the proposed scheme route, of which two are Grade I while the others are Grade II. Some of the assets are almost directly in line with the proposed pipeline route. The scheme design will need to take into account the modification of the route to avoid impact to these heritage assets, both temporary and permanent. Construction work has the potential to disturb unknown buried assets, however this would be further evaluated by desk studies and other investigations prior to construction. A watching brief, surveys and investigation would be implemented if required during construction, to reduce the risk of adverse impact to any unknown heritage assets.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are no designated landscapes associated with the scheme. There are four ancient woodlands and four LNRs in a 3km radius of the scheme. During construction the scheme will present minor and temporary effects on visual amenity in the local (non-designated) area. As the pipeline will be buried and the other assets have a very small footprint, the scheme is unlikely to have an effect on landscape and visual amenity during operation.	Small	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R35 River Aire Abstraction Option 1**
Scheme description	Following improvements in the quality of water in the River Aire, abstractions from the river are now considered viable. This abstraction would have a capacity of 10Ml/d. The scheme requires a 15km pipeline from the intake to WTW1 via WTW2 in order to utilise the raw water storage at WTW2. The Environment Agency has confirmed the availability of resource with a local hands-off flow condition of 55.9Ml/d. The scheme would provide a yield of 9.29Ml/d average (10Ml/d most days). The implementation period is anticipated to be 3 years.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA considered the potential impact of the scheme. The assessment concluded that there would be no likely significant effects on SAC or SPA. Likely significant effects could not be ruled out on SAC, SPA and SSSI as construction would be within 300m of the designations, meaning noise and visual pollution, as well as air and dust pollution could impact upon qualifying bird species, especially if construction takes place during the wintering season. An SSSI is in close proximity to the scheme pipeline route but as concluded for the SAC, construction impacts would be mitigated by best practice construction methods such that no significant effects are likely. An SSSI (a water sensitive site) is 7km south of the abstraction point but is unlikely to be adversely affected due to the small additional abstraction relative to total river flow. The proposed scheme also sits within IRZs of three SSSIs. Consultation with Natural England regarding mitigation for effects on these SSSIs will be required prior to commencement of works. The pipeline route runs through a Nature Reserve and will discharge into Graincliffe & Compensation a Reservoir. It also passes in close proximity to a LWS. The construction of the 15km pipeline, intake, pumping station and river crossing associated with the scheme also have the potential to have a minor temporary impact on non-designated habitats over a medium area (~4 ha). These effects would be mitigated as far as possible by sensitive routing of the pipeline and location of other assets, and the timing of such works. It is assumed the abstraction licence would include hands off flow conditions to prevent abstraction at river flows that would be detrimental to the aquatic environment and only minor impacts to fish, macro-invertebrate, macrophytes and phytobenthos are anticipated.	Medium	Medium	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have adverse effects on fresh water provision services through a new abstraction, by influencing surface water flows. However, the abstraction will be within licence limits. Further investigation is required to determine the risk of increased abstraction to the River Aire. Temporary effects on recreation and aesthetics are likely to occur due to disturbance.	Medium	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Invasive species may be present at construction sites. There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme will involve transfer of water within the River Aire catchment, however is not anticipated to increase the spread of invasive species.	Medium	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 308 biodiversity units would be lost during construction of the 15km pipeline; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Medium	Low	Long-term	Permanent	Medium	Medium	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Scheme construction may have minor, short-term adverse impact on residents located in population centres near to the pipeline route due to nuisance from noise, dust and vibration. There are no AQMAs within proximity of the scheme. These effects will be mitigated by best practice construction methods. An increase of 10 Ml/d in deployable output will help to maintain the supply-demand balance, reinforcing the supply system, and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable resulting in a moderate beneficial effect.	Large	Moderate (adverse) Moderate (beneficial)	Long-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme is within the Local Authority Greenbelt and in close proximity to five Registered Parks and Gardens. Additionally, there are a number of roads and public accesses (PRoWs) that may also be temporarily disrupted due to construction and increased traffic congestion. These effects will be mitigated by best practice construction methods and through liaison between Yorkshire Water, the Highways Agency and local councils. The pipeline passes close to a World Heritage Site and there may be temporary disruption associated with the construction although pipeline routing at the detailed design stage would minimise this as much as possible. Construction and operation of the scheme will not affect access to water-related recreation.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help to reduce water demand, nor will it support the use of sustainable / renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme (15km pipeline, pumping station, one river crossing and a new intake). The scheme will make use of some existing infrastructure. Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping.	Large	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Construction of the intake will be managed by good practice construction methods and any risk to the water body during construction is assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Pollution risks from construction activity will be mitigated by best practice methods. The WFD screening assessment identified that the greatest proportional change in the river flow regime would be reductions in the moderate flow to low flow conditions from the abstraction, with very low flow protected by a hands off flow condition. Abstraction will reduce dilution of local consented point discharges however the protection of low flow should not lead to deterioration in sanitary quality, although local effects on nutrient quality may occur.	Medium	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Flow in the River Aire will be reduced as a result of increased abstraction. WFD screening identified the greatest proportional change in the river flow regime would be reductions in the moderate flow to low flow conditions from the abstraction with very low flow protected by a hands off flow condition. Local to the abstraction, indicative flows derived from gauged data indicate ~10% reduction in year round low flows, with a 3% reduction predicted further downstream. The abstraction would take place from a CAMS water resource management unit which has sufficient water available to support this proposed rate of abstraction (with potential hands-off flow conditions to protect the environment). Impacts on sustainable abstraction and water resources are therefore assessed as negligible. This is subject to further discussion with the Environment Agency.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zones 2 and 3. As such temporary mitigation measures may be required to alleviate flood risk. However, there will be very little above ground land-take in Flood Risk Zones 2 and 3 as the pipeline will be buried. Taking into account additional pressures due to climate change, the additional abstraction will not have any effects on flood flows in the River Aire.	Medium	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency, or encourage a reduction in per capita consumption, and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the 15km pipeline will have a medium term, temporary but negligible effect on the quality and quantity of the soils in the area. The construction of other assets will require permanent land take of a small scale of land (1ha), most likely from Grade 3 or Grade 4 agricultural land. Given the small-scale of the above-ground assets required, no long-term adverse effects are anticipated on soils, geology or overall land-use management.	Medium	Medium	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	There are no AQMAs within proximity of the scheme. Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over the medium term, but these will be minimised through best practice construction techniques. Operation of the scheme will result in local air emissions from the pumping station.	Large	Medium	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in medium-term GHG emissions due to activities such as vehicle movements and use of generators. Operation of the scheme will require some additional annual energy consumption associated with increased pumping and water treatment chemical use, with a minor adverse impact on greenhouse gas emissions.	Large	Medium	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a contribution to securing a supply-demand balance over the next 25 years by supplying 10Ml/d, taking account of climate change risks and uncertainties.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are over 400 Listed Buildings of which two are Grade I and the rest Grade II within 1km of the scheme. There are five Grade II Registered Parks and Gardens as well as 30 Scheduled Monuments in a 1km radius of the scheme. The pipeline route also potentially passes close to the World Heritage Site. Impacts will be mitigated by adoption of best practice construction methods and careful detailed routing of the pipeline. Residual adverse effects are assessed as moderate. Construction work has the potential to disturb unknown buried assets, however this would be further evaluated by desk studies and other investigations prior to construction. A watching brief, surveys and investigation would be implemented if required during construction to reduce the risk of adverse impact to any unknown heritage assets.	Large	High	Long-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	One Registered Park and Garden is approximately 400m from the pipeline route. The pipeline will pass through six ancient woodlands.. However, assuming best-practice construction techniques, construction of the scheme will present minor and temporary effects on visual amenity in the local (non-designated) area. As the pipeline will be buried and the other assets have a very small footprint, the scheme is unlikely to have an effect on landscape and visual amenity during operation.	Large	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R37b(ii) River Aire Abstraction Option 4**
Scheme description	This scheme would involve a new river abstraction from the River Aire, requiring a new intake and raw water pump station and a new 2.8km pipeline to connect with an existing WTW. The abstraction would have a capacity of 50Ml/d, with rates limited to 10Ml/d at moderate to low flows (below Q50). The Environment Agency has confirmed the availability of resource with a local hands-off flow condition of 55.9Ml/d.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA considered the potential impact of the scheme. The assessment concluded that there would be no likely significant effects on these sites. The HRA also considered the potential impacts due to reduced flows on migration of qualifying fish species however concluded no likely significant effects The construction of the scheme has the potential to have a minor temporary impacts on species and on non-designated habitats. These effects would be mitigated as far as possible by sensitive routing of the pipeline and location of other assets, and the timing of such works. The proposed pipeline passes within 4.5km of an SSSI. Potential impacts could arise during the construction phase as a result of noise and dust generation, but best practice design and construction methods should mitigate this risk. One water-dependent SSSI is downstream of the proposed abstraction and may be influenced by reduction in flows during operation of the scheme, further investigation would be needed and these are assumed to be moderate adverse on a precautionary basis pending further information. Another water-dependent SSSI is located within 1km of the proposed abstraction.	Large	Medium	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have effects on the hydrological cycle at a regional scale, by influencing surface water flows. There are no areas of land recognised for their natural capital value but construction of the pipeline and pumping station could impact natural capital assets at a local scale. Construction could negatively affect some local areas of deciduous woodland and other habitat and also the natural capital of the River Aire, which, in this location, forms a relatively natural channel within a predominantly urban area, adding substantial value to the locality.	Small	Low	Short-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is the potential for INNS to be spread in the construction phase. Potential impacts of the introduction of INNS could create substantial adverse impacts as the scheme would be hydrologically connected to the River Aire. However this can be minimised with good construction practice. Operation of the scheme does not connect any hydrological features that were previously not connected and therefore the effect of INNS is considered to be negligible.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	An estimated 38 biodiversity units would be lost during construction of the intake, pumping station and pipeline; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Medium	Low	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Scheme construction may have minor, short-term adverse impact on residents located in population centres near to the pipeline route due to nuisance from noise, dust and vibration. There are no AQMAs within proximity of the scheme. These effects will be mitigated by best practice construction methods. An increase of 10-50 Ml/d in deployable output will help to maintain the supply-demand balance, reinforcing the supply system, and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable resulting in a moderate beneficial effect.	small (adverse) large (beneficial)	Moderate (adverse) High (beneficial)	short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) High (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	During construction, access to areas used for recreation may be reduced, however if best practice is followed, suitable diversions will be put in place. A National Cycle Route, runs nearby, as does a number of strategic walking routes, however none of these should require diverting. Construction and operation of the scheme will not affect access to water-related recreation.	Small	Moderate	Short-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	Resources for construction of additional components to the scheme will be sourced locally where possible. The scheme construction will require some use of materials at a scale consistent with the size of the new abstraction and some of the infrastructure is already in place. Once operational, there will be some additional energy and chemical use to pump and treat the water. There is no aspect of the scheme which will result in reductions in leakage	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Construction of the intake will be managed by good practice construction methods and any risk to the water body during construction is assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Pollution risks from construction activity will be mitigated by best practice methods. The WFD screening assessment identified minor impacts on the river flow regime, with very low flow protected by a hands off flow condition. Abstraction will reduce dilution of local consented point discharges however the protection of low flow should not lead to deterioration in sanitary quality, although local effects on nutrient quality may occur.	Large	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Flow in the River Aire will be reduced as a result of increased abstraction. The WFD screening assessment identified minor impacts on the river flow regime, with very low flow protected by a hands off flow condition. Local to the abstraction, indicative flows derived from gauged data indicate a less than 10% reduction flows across all flow bands. The abstraction would take place from a water resource management unit which has sufficient water available to support this proposed rate of abstraction (with potential hands-off flow conditions to protect the environment). Impacts on sustainable abstraction and water resources are therefore assessed as negligible. This is subject to further discussion with the Environment Agency.	Large	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	Aspects of the development will be constructed within Flood Zones 2 and 3 and construction may result in a slight increase in flood risk. The pumping station will be permanently located on a Flood Zone. During operation, the pipeline will be buried and therefore will not present any increase in flood risk.	Medium	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency, or encourage a reduction in per capita consumption, and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the 2.8km pipeline will have a negligible effect on the quality and quantity of the soils in the area. The construction of other assets will require permanent land take of a small scale of land in a predominantly urban area.	Small	n/a	Short-term	temporary	Low	Low	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over the medium term, but these will be minimised through best practice construction techniques. Operation of the scheme will result in local air emissions from the pumping station. There are no AQMA sites nearby.	Small	High	Medium-term	temporary	low	low (adverse)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in medium-term GHG emissions due to activities such as vehicle movements and use of generators. Operation of the scheme will require some additional annual energy consumption associated with increased pumping and water treatment chemical use, with a minor adverse impact on greenhouse gas emissions.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a beneficial contribution (10-50Ml/d) to securing a supply-demand balance over the future, taking account of climate change risks and uncertainties. This will help to increase resilience to climate change.	Medium	High	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The pumping station and pipeline construction impacts would be contained to a small area. Best practice design and construction methods should be used to mitigate impacts to the settings of four Grade 2 listed buildings. The asset is not designated, but is a structure with value, and construction may impact upon its setting and value. No operational impacts due to lower river flows are anticipated. Construction work has the potential to disturb unknown buried assets, however this would be further evaluated by desk studies and other investigations prior to construction. A watching brief, surveys and investigation would be implemented if required during construction to reduce the risk of adverse impact to any unknown heritage assets.	Small	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are some limited construction impacts on visual amenity anticipated in rural areas during river intake and pipeline construction, but this would be short-term. During operation there would be little above ground assets once construction completed. There are no AONB nearby. Construction, and some new permanent structures, will be within Greenbelt and will have small-scale impacts on the openness of this land.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R51 Supply Dales from the Tees - treated**
Scheme description	Treated water import 15Ml/d from Northumbrian Water to local supply in the Dales area by utilising spare treatment capacity at Northumbrian Water's WTW. The scheme is comprised of the following components: - Installation of duty and standby pumps in a new housing onsite. This pump would deliver treated water from the works into a new pipeline that would run across the river Tees and then cross country to connect into the clean water tank (CWT) at a YW WTW. - A new 27.9km (375mm) pipeline to a new buffer storage tank at an existing WTW via the clean water tank at YWs WTW; booster station (duty and standby pumps) required enroute. - A new buffer storage tank would be built at this WTW, with the capacity to provide one days storage. - A new 14.8km (375mm) pipeline from the WTW to, a service reservoir; duty and standby pumps at new WTW storage tank; booster station (duty and standby pumps) required enroute.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening assessed potential impacts. It concluded that there are no impact pathways during scheme operation and the proposed WTW pipeline and infrastructure is sufficiently distanced (~5.8km) from the designated site for direct and in-direct impacts to be unlikely to affect qualifying features. The 2nd pipeline is located 5.2km from the SAC & SPA. Due to the distance between the proposed scheme and the European site, no impact pathways from construction or operation have been identified. The proposed pipeline falls within the IRZ of an SSSI and is in close proximity (500m) to another two, . Construction would generate dust emissions and noise disturbance with potential for minor impacts on the SSSIs. Consultation with Natural England regarding mitigation for impacts on the SSSI would be required during project planning. The construction of the pipeline may also have minor adverse effects on a Coastal and Floodplain Grazing Marsh NERC habitat that is within 300m. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise these impacts. Construction of the various scheme assets, including the pipeline and works at the water treatment works will have temporary (1-2 years) but negligible effects on non-designated habitats, taking account of best practice mitigation measures and undertaking works at an appropriate time of year to minimise impact.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	No opportunities for the protection/improvement of natural capital or ecosystem services were identified for this scheme.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of spreading terrestrial INNS through construction activities. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. There is no risk of spreading aquatic INNS through the transfer of treated water.	Medium	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 327 biodiversity units would be lost during construction of the new pump, pipeline and storage tank; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Medium	Moderate	Long-term	Permanent	Medium	Medium	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	For the majority of its length, the proposed pipeline route runs through agricultural land or adjacent to main roads. However there are areas where the pipeline construction work would come in proximity to residential areas with the potential for some adverse effects from construction, such as nuisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. The scheme would deliver 15 Ml/d helping to maintain essential public water supplies and therefore help maintain public health and well-being. However, there will be a high cost relative to benefit provided which needs to be recognised when considering overall affordability of water bills.	Medium (adverse) Medium (beneficial)	Moderate (adverse) High (beneficial)	Long-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction activity will have a minor, temporary adverse impact on informal recreation due to temporary disruption to some recreational facilities such as public paths and rights of way (PRoW). Construction of the new pipelines will also intersect National Cycle Routes. These will require temporary diversion, which will impact upon their value as recreational assets. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. However, construction and operation of the scheme is not anticipated to have any significant adverse impacts the water environment for other users.	Medium	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (new pipeline and pumping stations). Once operational, minimal material inputs will be required, other than for regular maintenance and additional power for pumping.	Medium	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The scheme was screened out of WFD assessment. The construction of the pipeline has potential to have adverse effects on water quality in the River Tees and a number of streams and brooks that the pipeline would cross. Best practice construction techniques and appropriate mitigation measures such as controlling surface water run off and dust emissions from construction sites would render the adverse effects no more than minor.	Large	Low	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The abstraction would be within existing abstraction licence and operating agreement conditions with no likely adverse effects on the aquatic environment.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The pipeline would be located within approximately 6km of Flood Risk Zone 2 and 3. Temporary mitigation measures may be required to alleviate flood risk. However, the pipeline would be below ground and the pumping station would only have a small footprint above ground. Taking into account additional pressures due to climate change, the effects on flood storage are therefore assessed as minor (subject to the findings of any Flood Risk Assessment). The WTW that would undergo upgrade works is not within or in close proximity to any Flood Risk Zones.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water, or encourage a reduction in per capita consumption.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The scheme would not affect any sites designated for geological interest. The potential effects on soil associated with the construction work (pipeline trenching/tunnelling of 29.5 km) are considered temporary and reversible. The scheme would predominantly lie on Agricultural Land Classification 3 which is medium value. The pipeline would be buried so would only have temporary effects. As such, the adverse effects on land-use would be minor.	Medium	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust in the short term. These will be minimised through best practice construction techniques. There are no AQMAs surrounding the scheme and the increase in vehicle movements associated with the increased operations at Ainderby WTW would be minor.	Medium	High	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Scheme construction would be associated with carbon emissions from HGV movements and construction activities. During operation there would also be a minor increase in energy use associated with the pumping of additional water.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would negate the need for YW Reservoir water to be treated and would provide resilience to the Dales area as well as allowing 15 Ml/d of supply to be used elsewhere in the Grid SWZ.	Medium	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There is a registered park and garden and numerous listed buildings within 1 km of the scheme construction. There is potential for adverse construction effects on the setting of these designations, however, impacts would be temporary and minimised through best practice construction techniques. The pipeline route passes in very close proximity to a number of scheduled ancient monuments. The pipeline route could be diverted to avoid the monuments, in the case that this is not feasible then a watching brief may be put in place to safe guard any archaeological remains if required. Once operational, no adverse effects are anticipated.	Small	High	Long-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The western edge of the pipeline is within 5km of a National Park and an AONB and therefore construction could temporarily impact on the setting of these landscape designations. Construction of the pipeline may have long-term, temporary impacts upon local non-designated landscapes. The works would be within the existing WTW site and the pipeline would not be visible once completed.	Large	High	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R58 Transfer from UU Option 3**
Scheme description	This option is the first of two transfer schemes to import water from United Utilities' Strategic Resource Zone to Yorkshire Water's Grid SWZ. The scheme would utilise an existing connection to a 13'' United Utilities pipe on the boundary of United Utilities and Yorkshire Water's supply areas. The pipeline would be used to import 1 Ml/d to the Grid SWZ. The existing bulk supply point would require upgrading, which would include the installation of a replacement connection valve and a 500m length of 160mm OD PE pipeline. The scheme would provide a yield of 1Ml/d. WTW.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA screening assessed potential impacts . It concluded that there would be no adverse effects on the designated sites because the construction activities related to the 500m length of pipeline and the new valve will be undertaken within the existing road reserve and will not result in any physical loss or damage of designated habitats. The sensitivity of these sites is low to the nuisance effects that would be associated with the scheme's construction. The scheme is 500m from an SSSI and within the IRZ for the SSSI. Impacts associated with the works are expected to be negligible, however consultation with NE during project planning is required. The scheme is 140m from two LWS. However, the limited scale of works means that impacts on these sites would be negligible.	Small	Moderate	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	No adverse impacts on natural capital or ecosystem services are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a very low risk or introducing or spreading terrestrial INNS through construction activities as the construction activities would be constrained to the existing road reserve. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated in advance of construction works. The transfer of the water poses no risk to the introduction or spreading on aquatic INNS as the water would be treated and transferred directly into the grid.	Small	High	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Potential adverse effects through noise/vibration, dust emissions, HGV movement impacts generated during construction. Works would be short-term and only have minor adverse effects. The scheme would deliver 1 Ml/d helping to maintain essential public water supplies and therefore help maintain public health and well-being.	Small (adverse) Small (beneficial)	High (adverse) High (beneficial)	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction activity may cause temporary disruption to some recreational facilities such as public paths and rights of way. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. However, construction and operation of the scheme is not anticipated to have any significant adverse impacts the water environment for other users.	Small	High	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. It will make use of existing pipelines and only requires the installation of a valve and upgrade to a short length of pipeline (500 m). Utilising existing infrastructure delivers a beneficial effect due to the resources conserved that would have otherwise been used to construct new infrastructure.	Small	High	Short-term	Temporary	Low	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The construction of the 500m pipeline has the potential to have adverse effects on water quality in the in streams and brooks adjacent#, however effects are expected to ne negligible assuming best practice construction techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. No adverse effects on surface or ground water quality are anticipated during operation, as the scheme would utilise water already within United Utilities' Strategic Resource Zone. This option involves the transfer of treated water with no link to raw water source/abstraction. Therefore, there are no risks to WFD compliance associated with the operation of this option.	Small	High	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	No adverse effects on surface or ground water levels and flows are anticipated during construction or operation. The scheme would utilise water already within United Utilities' Strategic Resource Zone. It has been assumed that no additional abstraction will be required by United Utilities to support this scheme.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The pipeline would be located within or in proximity to Flood Risk Zones 2 or 3. Temporary mitigation measures may be required to alleviate flood risk. However, the pipeline would be within the existing road reserve so the effects on flood storage are therefore assessed as negligible. Operation of the scheme is not likely to affect flood risk.	Small	High	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The pipeline would be within the existing road reserve so would not have any adverse effects on geological features, soils or land use.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.1 To maintain and improve air quality.	There are no AQMAs surrounding the scheme. Construction and vehicle movements associated with the construction phase would generate emissions and dust in the short term. These will be minimised through best practice construction techniques.	Small	High	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Scheme construction would be associated with a negligible increase in GHG emissions from HGV movements and construction activities. There would be a negligible increase in GHG emissions associated with the energy required to pump the additional 1 Ml/d of supply.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scale of this scheme would make a minor beneficial contribution to securing a resilient water supply in the longer term to help meet the challenges of potential climate change impact on water supply reliability.	Small	High	Long-term	Permanent	Low	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are numerous listed buildings within 1km of the scheme construction. There is potential for adverse construction effects on the setting of these designations, however, impacts would be temporary and minimised through best practice construction techniques.	Small	High	Short-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The construction of the pipeline would have temporary effects on the landscape setting, however, they would be short-term and temporary.	Small	High	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial

Scheme name	**R59 Transfer from UU Option 4**									
Scheme description	This option is the second of two transfer schemes to import water from United Utilities Strategic Resource Zone. It would provide a treated import of 1Ml/d. The point of connection is a bulk supply point on United Utilities' asset. Infrastructure required includes new transfer pumping station, hypochlorite dosing, orthophosphate dosing and a new 6 km length, 250mm diameter pipeline. The import could be used to supply demand with surplus going elsewhere, allowing the existing supply to these villages to be used elsewhere in the Grid SWZ.									
SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening assessed potential impacts. It concluded that there would be no adverse effects on these sites because there would be no hydrological connectivity between the scheme and the designated sites and the proposed pipeline and pumping station are sufficiently distanced from the sites for direct and in-direct impacts to be unlikely to affect qualifying features. The scheme construction is in close proximity (20 m) to an SSSI. Construction would generate dust emissions and noise disturbance with potential for minor impacts on the SSSI. Although the SSSI is a high value site, its sensitivity to dust emissions and noise disturbance is medium. Consultation with NE regarding mitigation for impacts on the SSSI would be required during project planning. The scheme construction is within the IRZ of an SSSI. This site is sufficiently distanced from the construction for direct and in-direct impacts to be unlikely to affect qualifying features. Construction of the scheme assets, including the pipeline new pumping station, will have temporary (1-2 years) effects on non-designated habitats and waterways, taking account of best practice mitigation measures and undertaking works at an appropriate time of year to minimise impact.	Small	Moderate	Medium-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The potentially impacted waterways would be of medium sensitivity to the temporary, short-term construction work associated with construction of the pipeline. Scheme may have minor, temporary adverse effects on fresh water provisioning services within watercourses during pipeline construction.	Small	Moderate	Medium-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. There is no risk of spreading aquatic INNS through the raw water transfer as the water is treated.	Medium	High	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 59 biodiversity units would be lost during construction of pipelines and other infrastructure; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Natural Improvement Area.	Small	Low	Long-term	Permanent	Medium	Medium	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Potential adverse effects on nearby residential areas through noise/vibration, dust emissions, HGV movement impacts generated during construction. Works would be medium-term and only have minor adverse effects. The scheme would deliver 1 Ml/d helping to maintain essential public water supplies and therefore help maintain public health and well-being.	Medium (adverse) Medium (beneficial)	High (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low	Medium	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme would only cause temporary disruption to public right of ways, footpaths and access routes nearby the construction. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. However, construction and operation of the scheme is not anticipated to have any significant adverse impacts the water environment for other users.	Medium	High	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (new pipeline and other pumping and treatment assets). As such, the magnitude of effect is medium. Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for treatment chemicals and power for pumping. The scheme will make use of existing water infrastructure.	Medium	High	Medium-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Minor beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The construction of the pipeline has potential to have adverse effects on water quality in a number of streams and brooks that the pipeline would cross, however effects are expected to ne negligible assuming best practice construction techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. No adverse effects on surface or ground water quality associated with operation of the scheme are anticipated. It has been assumed that no additional abstraction will be required by United Utilities to support this scheme, and that water quality at source will be unaffected. This option involves the transfer of treated water with no link to raw water source/abstraction. Therefore, there are no risks to WFD compliance associated with the operation of this option.	Small	High	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The construction of the pipeline has potential to have adverse effects on water flows and levels in a number of streams and brooks as a result of changes to drainage. However, the effects are likely to be negligible. No adverse effects on surface or ground water flows associated with operation of the scheme are anticipated. It has been assumed that no additional abstraction will be required by United Utilities to support this scheme.	Small	High	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The pipeline would be located within or in proximity to Flood Risk Zones 2 or 3 in places. Temporary mitigation measures may be required to alleviate flood risk. However, the pipeline would be below ground with only a very small footprint above ground. The effects on flood storage are therefore assessed as minor. Operation of the scheme is not likely to affect flood risk.	Medium	High	Medium-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	There are no opportunities for raising awareness of water sustainability and the efficient use of water.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The scheme would not affect any sites designated for geological interest. The potential effects on soil associated with the construction work (pipeline trenching/tunnelling of 6 km) are considered medium scale, temporary and reversible. The scheme would predominantly lie on Agricultural Land Classification 3 and 4 which is medium value. The WTW works only covers a small land area and the pipeline would be buried so would only have temporary effects. As such, the adverse effects on land-use would be minor.	Medium	High	Medium-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust in the medium-term. These will be minimised through best practice construction techniques. There are no AQMAs surrounding the scheme and the increase in vehicle movements associated with the new pumping station would be minor.	Medium	High	Medium-term	Permanent	Low	Medium (adverse) Low (beneficial))	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Scheme construction would be associated with a minor increase in GHG emissions from HGV movements and construction activities. During operation there would also be a minor increase in GHG emissions associated with the energy required to pump the additional 1 Ml/d of supply.	Medium	High	Medium-term	Permanent	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scale of this scheme would make a minor beneficial contribution to securing a resilient water supply in the longer term to help meet the challenges of potential climate change impact on water supply reliability.	Medium	High	Long-term	Permanent	Low	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are numerous listed buildings within 1km of the scheme construction. There is potential for adverse construction effects on the setting of these designations, however, impacts would be temporary and minimised through best practice construction techniques.	Small	High	Medium-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The construction of the pipeline would have temporary effects on the landscape setting of an AONB, however, they would be medium-term and temporary.	Medium	High	Medium-term	Temporary	Low	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	**R61 East Yorkshire coast desalination**
Scheme description	Scheme involves the construction and operation of a desalination plant utilising brackish water from beach wells. Water would be desalinated using reverse osmosis. The scheme would require an ocean outfall including on-shore and off-shore pipelines to transport the water to the discharge point. The intake would be next to the proposed desalination plant. The scheme also requires construction of a 9 km pipeline to connect to the WTW. The pipeline route is based on a desalination plant location and the discharge at the WTW. The scheme would provide a yield of 20Ml/d. This proposal will require a new river/sea intake, desalination plant and raw water pumping station. Recovery rates for reverse osmosis is no more than 50%, therefore for a deployable output of 20Ml/d, an intake of 36Ml/d would be required.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening assessed potential impacts. It concluded that there would be no adverse effects on the SPA because it is not hydrologically linked to and is sufficiently distanced for adverse effects on the site related to construction to be negligible. With respect to the SAC, SPA and Ramsar, although the abstraction of seawater is unlikely to have a significant impact on water quantity in the estuary, the abstraction process has the potential to alter hydrological process through which intertidal and sub-tidal habitats are supported. The abstraction may also influence the distribution of bird species in the estuary and has the potential to influence fish populations through entrainment. Construction and operation of the proposed scheme also has potential to significantly influence qualifying features of the designated site, notably habitats and fish and bird species, through noise and vibration generation, pollution and habitat loss. Whilst most of these effects are likely to be reduced through mitigation, further information and justification is required to rule out impacts. The HRA screening has concluded likely significant effects on these sites prior to mitigation. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. The construction of the 9km connection pipeline is also within 10km of several SSSIs. Consultation with Natural England would be required during project planning. There are no NNR, or LNR designated sites within 1km of the route.	Large	Low	Long-term	Permanent	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the	Moderate adverse effects on the natural capital and ecosystem services could occur during project construction, particularly to high value cultural services such as recreation and tourism and aesthetic value. Such effects are also possible, although less likely, during operation.	Medium	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of spreading terrestrial INNS through construction activities. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. There would be no risk of introducing or spreading aquatic INNS during the operation of the plant as the reverse osmosis process would remove any species drawn up through the intake.	Large	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	An estimated 54 biodiversity units would be lost during construction of the desalination plant and pipeline; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Medium	Low	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The construction phase of the scheme may result in noise, dust and vibration impacts. These effects will be most notable in population centres within proximity to the pipeline route. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. After mitigation, residual construction effects will be of medium magnitude. The scheme would deliver 20 Ml/d helping to maintain essential public water supplies and therefore help maintain public health and well-being. However, there will be a high cost relative to benefit provided which needs to be recognised when considering overall affordability of water bills. Construction may result in an increase in local employment levels, aiding the local economy.	Medium	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium	Medium	Moderate adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme would cause temporary disruption to some strategic routes nearby the construction. Access to the water environment may be restricted in places during the construction period. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. Operation of the scheme is not anticipated to have any adverse impacts upon access to recreation and the environment in the local area.	Small	Moderate	Medium-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	Resources for construction of additional components to the scheme will be sourced locally where possible. Scheme construction will require the use of significant quantities of materials (reverse osmosis desalination plant, intake, pumping station, access roads, treated water main). Once operational, the scheme will involve the use of a significant amount of non-renewable materials such as chemicals associated with the treatment process (e.g. chemical dosing). The energy requirements for desalination are very high. There is no potential within this scheme for reduction in leakage.	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The construction of the desalination plant and associated infrastructure has potential to have adverse effects on water quality. Best practice construction techniques and appropriate mitigation measures such as controlling surface water run off and dust emissions from construction sites would render the adverse effects no more than minor. Discharge of brine during operation has the potential to have adverse effects on water quality. WFD screening assessed effects on the transitional water body. No significant changes in water quality are expected. No impact on chemical quality within the tidal Humber is expected if the water is discharged in zone of good mixing. The WFD screening concluded there would be no deterioration between status classes, no compromises to water body objectives and no impact on other water bodies.	Large	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme presents the opportunity to abstract water from a substantial supply of estuarine water, and therefore, when operating, would minimise the risks associated with unsustainable abstraction of groundwater and surface water. The scheme is abstracting indirectly, the effect on residence time of freshwater is considered imperceptible. Effects are therefore assessed as negligible.	Large	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Zone 3. As such temporary mitigation measures may be required to alleviate flood risk. However, once constructed there will be very little above ground land-take in Flood Zone 3 as the pipeline will be buried and the desalination plant is not in Flood Zone 3.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme would not have direct effects on water efficiency. The scheme does not directly contribute towards improving the awareness of water sustainability and its true value.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	An SSSI is within 1km, designated for its geological interest and may be impacted by construction of the pipeline. The potential effects on soil associated with the construction work (pipeline trenching/tunnelling of 9km) are considered temporary and reversible. Over 70% of the pipeline is within Agricultural Land Classification grade 2 Land. The desalination works only covers a small land area and the pipeline would be buried so would only have temporary effects. As such, the adverse effects on land-use would be minor. No long-term adverse effects are anticipated on geology, soils or overall land-use management.	Large	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate temporary air emissions and dust. These will be minimised through best practice construction techniques, however impacts are assessed as moderate due to the scale of the scheme. There are no AQMAs in close proximity to the scheme. The reverse osmosis plant will emit air pollutants during operation. Emissions will be minimised through best available techniques.	Large	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Scheme construction would be associated with GHG emissions from HGV movements and construction activities. Whilst the scheme will operate by reverse osmosis desalination technology, which requires half the energy of an alternative thermal process, it will still require a significant amount of energy with consequent carbon cost; chemical dosing requirements will also be significant. In view of the high carbon footprint of this scheme, impacts are assessed as major adverse.	Large	High	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scale of this scheme would make a moderate beneficial contribution to securing a resilient water supply in the longer term to help meet the challenges of potential climate change impact on water supply reliability	Large	High	Long-term	Permanent	Low (adverse) Medium(beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are numerous listed buildings (including 2 Grade II*) within 1 km of the scheme construction. There is potential for adverse construction effects on the setting of these designations. Impacts would be temporary and minimised through best practice construction techniques. Mitigation would be dependent on further study at the time. If required, a watching brief would be in place where construction is in close proximity to safe guard any undesignated, or previously undiscovered archaeological remains.	Small	Low	Short-term	Temporary	Low	**Low**	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are no landscape designations (statutory or non-statutory) in proximity to the scheme, however, construction of the pipeline may have temporary impacts upon local non-designated landscapes. The new treatment works could have a minor impact at most on visual landscape, assuming appropriate screening where necessary.	Large	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R78 Tidal Abstraction Reservoir**
Scheme description	The proposed option involves a new 30 Ml/d tidal abstraction and transfer by a new 12km pipeline to a new 86Ml storage reservoir (two equal compartments with storage 43Ml each), supporting abstraction of 20Ml/d for treatment. The abstraction would be limited to 16 hours per day on the ebb tide for water quality purposes (equivalent to two tidal cycles). The scheme would require expansion of the WTW to provide increased treatment capacity. The scheme includes a discharge outfall back utilising the same pipeline as the initial transfer to allow for emptying the lagoons for operational purposes.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening assessed potential impacts, although the abstraction of seawater is unlikely to have a significant impact on water quantity in the estuary, the abstraction process has the potential to alter hydrological process through which intertidal and sub-tidal habitats are supported. The abstraction may also influence the distribution of bird species in the estuary and has the potential to influence fish populations through entrainment. The construction of infrastructure required to support the scheme has potential to impact upon the qualifying features of the European sites. Impact pathways include exposure to pollution incidents, increased sedimentation, potential smothering, and loss of functionally linked habitats. Habitats identified within the footprint of the proposed infrastructure include coastal saltmarsh, mudflats and reedbeds, all of which are priority habitats. The pipeline overlaps with several watercourses which could impact on functionally linked spawning habitat upstream. Whilst most of these effects are likely to be reduced through mitigation, further information and justification is required to rule out impacts. The HRA screening has concluded likely significant effects on these sites prior to mitigation. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. The construction of the 12km connection pipeline is also within 10km of several SSSIs (Brantingham Dale, Drewton Lane Pits, Wyedale, Burton Bushes). Consultation with Natural England would be required during project planning. There are no NNR, or LNR designated sites within 1km of the route.	Medium	Low	Long-term	Permanent	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Moderate adverse effects on the natural capital and ecosystem services could occur during project construction, particularly to high value cultural services such as recreation and tourism and aesthetic value. Such effects are also possible, although less likely, during operation.	Medium	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of spreading terrestrial INNS through construction activities. During construction mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste. There would be small risk of introducing or spreading aquatic INNS during the operation of the plant should the tidal lagoons require emptying in exceptional circumstances via the bidirectional pipeline, with discharge to the estuary. The treatment process would remove any species drawn up through the intake and transferred to the tidal lagoon.	Large	Low	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 73 biodiversity units would be lost during construction of the tidal lagoons and pipeline; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Natural Improvement Area.	Medium	Low	Long-term	Permanent	Low	Medium	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	There is substantial construction required for this scheme and this may impact upon the communities it is close to. Construction of the new tidal abstraction reservoir will be within 100m of a major health facility. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. After mitigation, residual construction effects will be of medium magnitude. The scheme would deliver 20 Ml/d helping to maintain essential public water supplies and therefore help maintain public health and well-being. However, there will be a high cost relative to benefit provided which needs to be recognised when considering overall affordability of water bills. Construction may result in an increase in local employment levels, aiding the local economy.	Medium	Moderate (adverse) High (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium	Medium	Moderate adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The scheme would cause temporary disruption to some strategic routes nearby the construction. Access to the water environment may be restricted in places during the construction period. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between Yorkshire Water, local councils and the Highways Agency. Operation of the scheme is not anticipated to have any adverse impacts upon access to recreation and the environment in the local area.	Small	Moderate	Medium-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	Resources for construction of the scheme will be sourced locally where possible. Scheme construction will require the use of significant quantities of materials (tidal reservoirs, intake, pumping station, access roads, bi-directional pipeline). Once operational, further material inputs will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping. The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy or reduce water lost via leakage.	Large	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	The construction of an intake and associated infrastructure has potential to have adverse effects on water quality and any water courses that the pipelines cross. Best practice construction techniques and appropriate mitigation measures such as controlling surface water run off and dust emissions from construction sites would render the adverse effects no more than minor. The WFD assessment on the water body has identified that there is no risk of deterioration in any of the physico-chemical or chemical elements as a result of the operation of the scheme.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme presents the opportunity to abstract water from a substantial supply of estuarine water, and therefore, when operating, would have a beneficial effect on unsustainable abstraction of groundwater and surface water. The scheme is abstracting indirectly, however, the effect on residence time of freshwater is considered imperceptible. Effects are therefore assessed as negligible.	Large	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The infrastructure required (works, lagoons), will partly be within Flood Zones 2 and 3 and may result in increases in hardstanding in this area and therefore and increase in flood risk. The conveyance route will be partly through Flood Zones 2 and 3 and therefore may result in a small increase in flood risk during the construction phase.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	An SSSI, designated for its geological interest, is directly adjacent the pipeline route and may be impacted by construction of the pipeline. Consultation with Natural England would be required during project planning. The potential effects on soil associated with the construction work (pipeline trenching/tunnelling of 12km) are considered temporary and reversible. The proposed lagoons and 77% of the pipeline is within Agricultural Land Classification grade 2 land. The pipeline would be buried so would only have temporary effects, however the tidal lagoons would result in permanent loss and as such, the adverse effects on land-use would be moderate.	Medium	Low	Long-term	Permanent	Moderate (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction of the scheme would result in emissions to air, resulting in temporary, localised degradations in air quality. The scheme is not in proximity to any AQMAs.	Small	Moderate	Short-term	Temporary	Low	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Operation of the scheme will require additional energy consumption associated with increased pumping.	Small	Moderate	Long-term	Permanent	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a contribution (20Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Medium	Moderate	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are a number of listed buildings within 1km of the proposed infrastructure, including many Grade II* listed structures, whose settings may be impacted during construction. Impacts would be temporary and minimised through best practice construction techniques. A Scheduled Monument is just over 1km from the new tidal intake, it is unlikely that this designation would be impacted during construction or operation.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will require new infrastructure on the banks of the River Humber, and adjacent to the existing WTW near. These areas are not designated for their landscape value, but the additional infrastructure will nonetheless cause minor impacts to the local landscape and openness.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R85 Recommission Kirklees WTW**									
Scheme description	The scheme would involve building a new WTW plant (17Mld) at existing previously decommissioned WTW. The WTW would be supplied by raw water abstraction from existing sources based on recommissioning of existing transfers to the plant on the site of the previous WTW. The scheme would provide a resilience benefit, utilising existing resources and not require any increased abstraction or new transfer pipelines. All construction works would be within the existing WTW site boundary.									
SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening assessed potential impacts. This option does not require any abstraction or new water transfer. No suitable functionally linked habitat has been identified within the footprint of the proposed scheme. Construction works would be sufficiently far from the sites also, so no likely significant effects are anticipated. There are also SSSIs within 10km and two areas of ancient woodland within 1km; construction would generate dust emissions and noise disturbance with potential for impacts on the habitat. Consultation with Natural England regarding mitigation for impacts would be required during project planning, however given the scale of the construction works and with best practice mitigation impacts (e.g. noise abatement and dust suppression) are assessed as negligible.	Small	Moderate	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in only small decreases in the natural capital assets.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme construction phase is likely to result in temporary minor nuisance from noise, dust and vibration, although the construction areas are predominantly in rural locations there are small settlements nearby. These impacts will be mitigated as far as possible through best construction practices. During operation, the scheme will not result in any improvements or detriment to human health. Operation of the scheme will not affect access to open spaces. An increase of up to 17Ml/d in available supply output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Medium	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction or operational phases for this scheme would not result in any adverse, or beneficial impacts, to the water environment as a recreational, tourism or navigational asset.	Small	Moderate	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme (new WTW). Once operational, further material inputs will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. The scheme would not lead to any additional abstraction from any water courses, as such, the WFD assessment has identified that there are no pathways to impact any water bodies as a result of the operation of this scheme, There would be no discernible impacts on any water quality elements.	Small	Low	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	This scheme would not involve abstraction from a waterbody and is not anticipated to impact on groundwater or surface water levels and flow. There are no risks to WFD compliance associated with the operation of this option.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The construction of a new WTW on the existing site will have no effect on flood risk.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction will be within the existing WTW site boundary. No adverse effects are anticipated on soils, geology or overall land-use management.	Medium	N/A	N/A	N/A	N/A	N/A	N/A	None
Air and climate	6.1 To maintain and improve air quality.	There are no AQMAs within proximity of the scheme and while the location is predominantly rural there are a number of properties within 1km of the site. Construction work and vehicle movements associated with construction phase will give rise to temporary emissions and dust over the short term, but these will be minimised through best construction practices.	Small	Moderate	Medium-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Air and climate	6.2 To minimise greenhouse gas emissions.	Given the scale of scheme construction activities (new WTW), a small quantity of carbon emissions are anticipated from HGV movements and construction activities. During operation there would also be a minor increase in energy use associated with further material inputs which will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute towards securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The WTW site is within 1km of two Grade II listed buildings. These assets may experience some small reduction in the quality of their setting as a result of the construction. With best practice construction methods no significant adverse effects are anticipated. Construction work has the potential to disturb unknown buried assets although the construction would be restricted to an existing WTW site. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets. No impacts are expected during the operational phase.	Small	Low	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The WTW site is within Greenbelt. Mitigation measures should minimise this effect, including sensitive design such that they do not detract from local distinctiveness.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R86 Aire and Calder new WTW**
Scheme description	This scheme would involve construction of a new WTW (70 Ml/d capacity) and two 380ML storage lagoons to be located to the west of the existing WTW. The works would be supplied by two new river abstractions, one from the River Aire and one from the River Calder. The water treated at the new works would then be transferred to the WTW for entry into the treated water network. Both abstractions would require new intakes and raw water pumping stations (duty and standby pumps), and new transfer pipelines to the new works (700mm main (2.9km) from the River Aire and 800mm main (11.8 km) from the River Calder). A 0.73km 1000mm transfer pipeline would connect the new works with the WTW. The abstractions would require licensing by the Environment Agency and are assumed to have the following capacities: River Aire: 50Ml/d above Q50, 20Ml/d Q90-Q50, 10Ml/d below Q90 to Hands off Flow (HoF) River Calder: 60Ml/d above Q30, 40Ml/d to Q95 (~HoF).

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	HRA screening was conducted to assess possible impacts of the scheme on South Pennine Moors SAC (UK0030280) and South Pennine Moors Phase 2 SPA (UK9007022). The watercourses associated with the South Pennine Moors SAC are unlikely to be affected by the proposed abstractions on the River Calder or Aire due to not sourcing their flows from either of the rivers, therefore, no likely significant effects are anticipated on this site. Due to the potential loss of supporting habitat for golden plover, and the potential disturbance of supporting habitat for merlin and breeding birds, likely significant effects on the South Pennine Moors Phase 2 SPA cannot be ruled out. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. An SSSI is downstream of the proposed abstraction and may be influenced by reduction in flows during operation of the scheme, further investigation would be needed and these are assumed to be moderate adverse on a precautionary basis pending further information. An SSSI is also located within 1km of the proposed abstraction. The proposed pipeline route from the River Calder to the new WTW is adjacent to an LNR, and within 1km of another, LNR. There is one area of ancient woodland intersected by the proposed route, with an additional six additional areas within 1km. It is assumed the abstraction licence would include hands off flow conditions to prevent abstraction at river flows that would be detrimental to the aquatic environment and only minor impacts to fish, macro-invertebrate, macrophytes and phytobenthos are anticipated.	Large	Medium	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have adverse effects on fresh water provision services through a new abstraction, by influencing surface water flows.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor Adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Invasive species may be present at construction sites. There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS, as it would not involve movement of people or resources (e.g. water) between catchments.	Small	Low	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	An estimated 265 biodiversity units would be lost during construction of the intake, pumping station and pipeline; this will provide moderate beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Nature Improvement Area.	Medium	Low	Long-term	Permanent	Medium	Medium	None	Moderate beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Scheme construction may have minor, short-term adverse impact on residents located in population centres near to the pipeline route due to nuisance from noise, dust and vibration. An AQMA is within 1km of the proposed route from the River Calder to the new works which could result in a decrease in air quality in this area. These effects will be mitigated by best practice construction methods. An increase of up to 70 Ml/d in deployable output will help to maintain the supply-demand balance, reinforcing the supply system, and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable resulting in a moderate beneficial effect.	Small (adverse) Large (beneficial)	Moderate (adverse) High (beneficial)	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	During construction, access to areas used for recreation may be reduced, however if best practice is followed, suitable diversions will be put in place. A National Cycle Route runs nearby, as does a number of strategic walking routes, however none of these should require diverting. Construction and operation of the scheme will not affect access to water-related recreation.	Small	Moderate	Short-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	Resources for construction of additional components to the scheme will be sourced locally where possible. The scheme construction will require some use of materials at a scale consistent with the size of the two new abstractions and new WTW; some of the infrastructure is already in place. Once operational, there will be some additional energy and chemical use to pump and treat the water. There is no aspect of the scheme which will result in reductions in leakage	Small	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Construction will be managed by good practice construction methods and any risk to WFD water bodies during construction is assessed as low. Temporary effects due to construction will not cause deterioration of any water bodies. Pollution risks from construction activity will be mitigated by best practice methods. The WFD screening assessment identified minor impacts on the river flow regime within the Aire and Aire to River Calder water bodies, with very low flow protected by a hands off flow condition. Abstraction will reduce dilution of local consented point discharges however the protection of low flow should not lead to deterioration in sanitary quality, although local effects on nutrient quality may occur. WFD screening assessed also impacts on the Calder and Calder to River Colnes water bodies. The assessment concluded that the reduced flow in the River Calder is not considered likely to result in any deterioration in status as it assumed that for an abstraction license to be granted for the new abstraction from the River Calder that a suitable hands off flow condition will have to be adopted in order to ensure that there is no deterioration in any of the ecological status elements, particularly associated with the identified water quality pressures in this water body.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	Flow in the River Aire and River Calder will be reduced as a result of increased abstraction. The WFD screening assessment identified minor impacts on the river flow regime, with very low flow protected by a hands off flow condition. Local to each abstraction, indicative flows derived from gauged data indicate a less than 10% reduction flows across all flow bands.	Large	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	During construction, some of the works will be located within or in proximity to Flood Risk Zone 3. As such temporary mitigation measures may be required to alleviate flood risk. However, there will be very little above ground land-take in Flood Risk Zones 3 as the pipelines will be buried and the new WTW above ground assets are not within a flood risk zone, with negligible impact on flood storage. Taking into account additional pressures due to climate change, the additional abstraction will not have any effects on flood flows in the River Calder or River Aire.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor Adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency, or encourage a reduction in per capita consumption, and presents no real opportunity to increase awareness of water sustainability.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction of the ~ 15km of pipeline will have a negligible effect on the quality and quantity of the soils in the area. The construction of other assets, including the new WTW, will require permanent land take of a small scale of land in a predominantly urban area. There are no areas of Agricultural Land Classification Grades 1-3 along the proposed pipeline routes.	Small	n/a	Short-term	temporary	Low	Low	Negligible adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with construction phase will give rise to temporary air emissions and dust over the medium term, but these will be minimised through best practice construction techniques. The AQMA is within 1km of the proposed route from the River Calder to the new works, and project traffic will be routed away from this area where possible. Operation of the scheme will result in local air emissions from the pumping station.	Small	High	Medium-term	temporary	low	low (adverse)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction of the scheme will result in medium-term GHG emissions due to activities such as vehicle movements and use of generators. Operation of the scheme will require some additional annual energy consumption associated with increased pumping and water treatment chemical use, with a minor adverse impact on greenhouse gas emissions.	Medium	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a beneficial contribution (up to 70 Ml/d) to securing a supply-demand balance over the future, taking account of climate change risks and uncertainties. This will help to increase resilience to climate change.	Medium	High	Long-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The pumping station and pipeline construction impacts would be contained. Best practice design and construction methods should be used to mitigate impacts to the settings of Grade I listed and six Grade 2* listed buildings that are all within 1km of the route. No operational impacts due to lower river flows are anticipated. Construction work has the potential to disturb unknown buried assets, however this would be further evaluated by desk studies and other investigations prior to construction. A watching brief, surveys and investigation would be implemented if required during construction to reduce the risk of adverse impact to any unknown heritage assets.	Small	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are some limited construction impacts on visual amenity anticipated in rural areas during river intake and pipeline construction, but this would be short-term. During operation there would be little above ground assets once construction completed. There are no AONB nearby. Construction, and some new permanent structures, will be within the Bradford district of the Liverpool, Manchester and West Yorkshire Greenbelt and will have small-scale impacts on the openness of this land.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R87 Rebuild Northallerton WTW**
Scheme description	Build a new WTW on the existing site that was previously decommissioned. Supply would be provided based on recommissioning of an existing transfer pipeline, which would need a new abstraction permission of up to approximately 4 Ml/d. All construction work would be completed within the existing site boundary.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening assessed potential impacts. No suitable functionally linked habitat has been identified within the footprint of the proposed scheme. Due to the distance between the proposed construction scheme (assuming no new pipelines are required) and the European sites , no impact pathways from construction have been identified. The sites are both hydrologically connected via a local river which flows south from the SAC/SPA to the reservoir. The abstraction from the reservoir is downstream of the beck and therefore, qualifying habitats are is unlikely to be affected by the proposal. Therefore, no likely significant effects are anticipated. There is one area of ancient woodland within 1km; construction would generate dust emissions and noise disturbance with potential for impacts on the habitat. Consultation with Natural England regarding mitigation for impacts would be required during project planning, however given the scale of the construction works and with best practice mitigation impacts (e.g. noise abatement and dust suppression) are assessed as negligible.	Small	Moderate	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in only small decreases in the natural capital assets.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme construction phase is likely to result in temporary minor nuisance from noise, dust and vibration. These impacts will be mitigated as far as possible through best construction practices. During operation, the scheme will not result in any improvements or detriment to human health. Operation of the scheme will not affect access to open spaces. An increase of up to 4 Ml/d in available supply output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Medium	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction or operational phases for this scheme would not result in any adverse, or beneficial impacts, to the water environment as a recreational, tourism or navigational asset.	Small	Moderate	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme (new WTW). Once operational, further material inputs will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. The WFD assessment identified potential pathways and to impacting the Cod Beck Reservoir (GB30429296) and Cod Beck from Source to Broard Beck (GB104027069010) surface water bodies and that further investigations are required to understand the likely impacts given the abstraction from the reservoir was last made in 2006.	Medium	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The WFD assessment concluded that on the basis of the currently available information it is unclear what the magnitude of flow change and what the frequency of this change would be as a result of this option. The increased abstraction would change the spill regime from the reservoir, which contributes a significant portion of the flow. Further investigation is required into the change in spill regime and the sensitivity of the ecological receptors in the Reservoir and surface water bodies to these changes.	Medium	Low	Long-term	Permanent	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The construction of a new WTW on the existing site will have no effect on flood risk.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction will be within the existing WTW site boundary. No adverse effects are anticipated on soils, geology or overall land-use management.	Medium	N/A	N/A	N/A	N/A	N/A	N/A	None
Air and climate	6.1 To maintain and improve air quality.	There are no AQMAs within proximity of the scheme however there are a number of residential properties within 1km of the site. Construction work and vehicle movements associated with construction phase will give rise to temporary emissions and dust over the short term, but these will be minimised through best construction practices.	Small	Moderate	Medium-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Given the scale of scheme construction activities (new WTW), a small quantity of carbon emissions are anticipated from HGV movements and construction activities. During operation there would also be a minor increase in energy use associated with further material inputs which will be required, such as regular maintenance, additional resources for treatment and additional electricity for pumping.	Medium	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would contribute towards securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	The WTW site is within 1km of 106 Grade II listed buildings. These assets may experience some small reduction in the quality of their setting as a result of the construction. With best practice construction methods no significant adverse effects are anticipated. Construction work has the potential to disturb unknown buried assets although the construction would be restricted to an existing WTW site. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets. No impacts are expected during the operational phase.	Medium	Moderate	Medium-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are some limited construction impacts on visual amenity anticipated; the WTW site is within the National Park. Mitigation measures should minimise this effect, including sensitive design such that they do not detract from local distinctiveness.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R88 Increase storage at an existing WTW in North Yorkshire**									
Scheme description	This scheme would involve construction of two raw water storage lagoons at the existing WTW. The lagoons would provide a total of 48Ml of storage (up to 3 days of storage) to support supply during peak demands and outages.									
SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	There is one designated site within 10km of the scheme an SSSI. Impacts to this site are not anticipated given the distance from the option construction area. There are several areas of priority habitat traditional orchard in proximity to the proposed lagoon location, the closest site is 400m. Best practice construction techniques and appropriate mitigation measures such as noise abatement barriers and dust dampening would minimise any impacts. Consultation with Natural England regarding detailed design and mitigation for impacts on priority habitat areas would be required during project planning.	Small	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in only small decreases in the natural capital assets.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a risk of spreading terrestrial INNS through construction activities through the transportation of soil and construction waste. During construction, mitigation measures will be in place to avoid spread of INNS. Invasive species on site are to be identified and removed or treated prior to disposal of construction waste.	Small	High	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha)	An estimated 28 biodiversity units would be lost through construction of the bankside lagoons; this will provide minor beneficial opportunities for compensatory planting and habitat enhancement. The scheme does not fall within a Natural Improvement Area.	Medium	High	Long-term	Permanent	Low	Low	None	Minor beneficial
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Scheme construction has the potential for some temporary adverse effects, such as nuisance from noise, dust and vibration, towards residents in the nearby area. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through local parish, town and district councils. The option will provide additional storage at the WTW which will help maintain essential public water supply.	Small (adverse) Small (beneficial)	Moderate (adverse) High (beneficial)	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction or operation phases for this scheme would not result in any adverse, or beneficial impacts, to the water environment as a recreational, tourism or navigational asset.	Small	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require use of materials at a scale consistent with the size of the scheme. Once operational, further material inputs will be required, such as regular maintenance, and additional electricity for pumping.	Small	Moderate	Short-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. The scheme would not lead to any additional abstraction from any water courses, as such, the WFD assessment has identified that there are no pathways to impact any water bodies as a result of the operation of this scheme, There would be no discernible impacts on any water quality elements.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The scheme would not lead to any additional abstraction from any water courses, as such, the WFD assessment has identified that there are no pathways to impact any water bodies as a result of the operation of this scheme. There would be no adverse impacts on surface water flows.	Small	Low	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The two new lagoons will not be constructed within in Flood Risk Zones 2 and 3 and the construction phase is not anticipated to result in any additional flood risk. Taking into account additional pressures due to climate change, the effects on flood storage are assessed as negligible (subject to the findings of any Flood Risk Assessment).	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	The option is located on Grade 3 agricultural land. The scheme would result in the loss of approximately 3.3ha of land. Local geology or geomorphology would not be impacted.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	Construction and vehicle movements associated with the construction phase would generate emissions and dust for a limited duration. These will be minimised through best practice construction techniques. There are no AQMAs within 1km of the scheme.	Small	High	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	It is not anticipated that the operational phase of the proposed scheme will result in any additional greenhouse gas emissions above the baseline. Construction would result in a minor increase in greenhouse gas emissions	Small	High	Long-term	Permanent	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The proposed scheme would result in an additional 48Ml of water storage. This will improve resilience to the threats of climate change.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Minor beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There is only one listed building (Grade II) within 1km of the option. There is potential for indirect adverse construction effects on the setting of this designation as a result of noise, dust and vibrations, however, impacts would be temporary and minimised through best practice construction techniques. Construction of the scheme will involve excavation which could also affect unknown buried assets. A watching brief would be put in place to safe guard any archaeological remains. Once operational, no adverse effects are anticipated.	Small	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Moderate (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	An AONB is within 5km of the option. The new infrastructure would be within a site adjacent to an existing WTW and as a result would not impact upon openness. Negligible impacts are anticipated.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	**R89 Convert Wensleydale springs to boreholes**
Scheme description	Yorkshire Water currently permitted to use water from springs in the Wensleydale area for supply. An increased benefit could be gained by installing two boreholes at each of the existing WTWs. The assumed yield from the proposed boreholes is 0.9 Ml/d and from the other, is 0.7 Ml/d. There are no associated off-site pipeline and construction requirements for the boreholes and associated assets are contained within treatment works site boundaries.

SEA topics and objectives			**Assessment of option**							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA assessed the potential impacts of the scheme on the European designated sites. These sites, as well as the underlying SSSI, are located approximately 0.09 km north-east of the proposed borehole. Several qualifying features present within the sites are water dependent, and due to the distance between the borehole and the sites, impacts to groundwater supply effecting qualifying and supporting habitats within the SAC and SPA are possible. Therefore, likely significant effects on the SAC and SPA cannot be ruled out. As such, should this option be selected in the preferred plan, further assessment and investigation and Stage 2 Appropriate Assessment would be required. Please see the HRA for further details. The HRA also assessed the potential impacts of the scheme and concluded no likely significant effects given the distance from the scheme and the nature of the qualifying features. There are also two areas of ancient woodland within 1km of the borehole and one area within 1km of the 2nd borehole. There is a risk of some minor temporary impacts during the construction phase caused by dust, noise and vibration; however these will be mitigated by standard best practice construction methods.	Large	Medium	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	Construction of the option would result in only small decreases in the natural capital assets.	Small	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated in advance of construction works. Operation of the scheme is not expected to introduce or spread INNS.	Small	Moderate	Medium-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Given the rural locations and the small scale of the works, no nuisance from noise, dust and vibration is anticipated during construction. An increase of 1.6 Ml/d in deployable output will help to maintain the supply-demand balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.	Small (adverse) Medium (beneficial)	Moderate (adverse) Moderate (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	The construction or operational phases for this scheme would not result in any adverse, or beneficial impacts, to the water environment as a recreational, tourism or navigational asset.	Small	Moderate	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme. The scheme will make use of some of the WTW infrastructure. Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for power for pumping.	Small	Moderate	Long-term	Permanent	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	Any construction activities associated with this option will be undertaken using best practice techniques. As a result, there will not be a risk to WFD compliance associated with the construction of this option. The WFD assessment identified that there are a number of chemical pressures in the groundwater body that my be increased as a result of additional abstraction and that further investigation is required.	Medium	Low	Long-term	Permanent	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	The WFD assessment concluded the drawdown of groundwater levels and increased recovery time could impact the timing of the reinstatement of flows from the springs which contribute a significant amount of flow to the surface water body. This reduction in flow has the potential to cause deterioration in the biological status elements with significant in-channel habitat changes.	Medium	Low	Long-term	Permanent	High (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial

SEA topics and objectives			Assessment of option							
Topic	**Objective**	**Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)**	**Scale of effect: geography and/or population affected** (small / medium / large)	**Certainty of effect** (low / moderate / high)	**Duration of effect** (short-term / medium-term / long-term)	**Permanence of effect** (permanent / temporary)	**Magnitude of effect** (low / medium / high)	**Value / sensitivity of receptor** (low / medium / high)	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The construction of a new boreholes on the existing WTW sites will have no effect on flood risk.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Construction will be within the existing WTW site boundaries. No adverse effects are anticipated on soils, geology or overall land-use management.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	Construction work and vehicle movements associated with the construction phase will give rise to temporary air emissions and dust over the short term, these will be small scale and will be minimised through construction best practices.	Small	Moderate	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Construction work and vehicle movements associated with the construction phase will give rise to temporary GHG emissions over the short term, these will be minimised through construction best practices. Operation of the scheme will require some very small additional annual energy consumption associated with increased groundwater pumping and minor additional water treatment chemical use, with negligible impact on greenhouse gas emissions.	Small	Moderate	Short-term	Temporary	Low	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a small beneficial contribution (1.6 Ml/d) to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	Moderate	Long-term	Permanent	Low	Low (adverse) Medium (beneficial)	Negligible adverse	Negligible beneficial
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are eight listed assets, all Grade II listed buildings, within 1km of the proposed boreholes. These assets may experience some small reduction in the quality of their setting as a result of the construction. With best practice construction methods no significant adverse effects are anticipated. Construction work has the potential to disturb unknown buried assets although the construction would be restricted to two existing WTW sites and will be small scale. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets. No impacts are expected during the operational phase.	Small	Low	Short-term	Temporary	Low	Low	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	There are some limited construction impacts on visual amenity anticipated; the WTW site is within the National Park. Mitigation measures should minimise this effect, including sensitive design such that they do not detract from local distinctiveness.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name	**R90 North Yorkshire annual licence increase**
Scheme description	This option is a licence change to increase the annual abstraction from a YW Reservoir to, another YW Reservoir, which would require permission from the Environment Agency. The option would not involve any increase in abstraction overall (i.e. combined licence total would remain the same). It would allow a reduction in pumping by reducing the take from the rivers and increase the use of the direct gravity transfer from Reservoir to Reservoir.

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Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA assessed the potential impact of this scheme on the SAC and SPA which are located 20m north of the reservoir. The reservoir is hydrologically connected to the SAC and SPA via several watercourses which drain off the moors and into the reservoir. Due to the watercourses being upstream, no impact pathways via increased abstraction at the reservoir have been identified on the SAC/SPA. The HRA also assessed the potential impacts, however no impacts pathways were identified. The HRA screening concluded that there would be no likely significant effects on these sites. The scheme will have a negligible impact on flows in the River downstream of the Reservoir and is therefore assessed as having a negligible impact on aquatic ecology. There is no construction phase associated with this scheme.	Small	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing surface water flows. However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction.	Small	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Operation of the scheme is not expected to introduce or spread INNS, as it is a licence transfer at existing abstractions and therefore is not creating any hydrological connections. There are no construction works associated with this option.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.4 To provide opportunities for habitat creation or restoration and a net benefit/gain for biodiversity (ha).	The scheme will not provide opportunities for habitat creation, restoration or a net benefit/gain for biodiversity.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio-economic development through provision of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	The scheme will not result in a increase of in deployable output however it will increase the resilience of the overall supply system. Operation of the scheme will not result in any improvements to human health or well-being and there is no construction phase associated with this scheme.	Small	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Population and human health	2.2 To protect and enhance the water environment for other users, including recreation, tourism and navigation.	Operation of the scheme will not result in any significant effects on the water environment.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste including leakage from the water supply system, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy or reduce water lost via leakage. Scheme construction will not require use of new materials as there is no construction associated with the scheme. The scheme will make use of existing infrastructure.	Small	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies	WFD screening assessed impacts on the Reservoir, another Reservoir and the Catchment (trib of Wharfe) surface water bodies. The change in abstraction arrangements is not considered likely to result in a deterioration in chemical status.	Medium	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.2 To avoid adverse impact on surface and groundwater levels and flows, and ensure sustainable management of abstractions.	WFD screening assessed impacts on the Reservoir, another Reservoir and the Catchment (trib of Wharfe) surface water bodies. The change in abstraction arrangements is not considered likely to result in a change in the overall water volume in the reservoirs and the flow change will be within normal flow envelopes. There would be no adverse impacts on surface water flows.	Medium	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk, taking climate change into account.	The additional abstraction will have a negligible effect on flood flows.	Medium	Moderate	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Water	4.4 To increase awareness of water sustainability and efficient use of water.	The scheme will not increase water efficiency and presents no real opportunity to increase awareness of water sustainability.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	No impact upon local geology or land quality is anticipated from the operation of this option.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.1 To maintain and improve air quality.	No additional air emissions are associated with the operation of this option.	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.2 To minimise greenhouse gas emissions.	Operation of the scheme will associate with reduced pumping at the abstraction on the River Wharfe which will result in a net decrease in energy consumption as the option would increase the use of existing gravity transfer from Reservoir to Reservoir, with a minor beneficial impact on greenhouse gas emissions.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	The scheme would make a contribution to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial

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Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	There are no construction activities associated with this option. Operation of the scheme and associated impacts on river flow is unlikely to have an adverse effect on any heritage asset or setting.	Small	High	Long-term	Permanent	Low	Low	Negligible adverse	Negligible beneficial
Landscape and visual amenity	8.1 To protect and enhance designated and undesignated landscapes, townscapes and the countryside.	The scheme will not require any new infrastructure therefore there will be no long-term impact during operation.	N/A	N/A	N/A	N/A	N/A	N/A	None	None

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