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Environmental Report – Appendices

Yorkshire Water Services Limited Water Resource Management Plan 2019 Strategic Environmental Assessment

Report for Yorkshire Water Services, in association with Ove Arup and Partners

ED 12712 | Issue Number 2 | 05/02/2020

Appendices

- Appendix A Statutory consultee responses to the SEA Scoping Report
- Appendix B Quality assurance checklist
- Appendix C Review of policies, plans and programmes
- Appendix D Environmental baseline review
- Appendix E Option assessment matrices

Appendix A Statutory consultee responses to the SEA Scoping Report

The SEA Scoping Report was issued to statutory consultees on 31 May 2017. Comments received from the Environment Agency, Natural England and Historic England have been compiled in Tables A1, A2 and A3 below, including responses from Yorkshire Water.

Envir	onment Agency comments	Yorkshire Water response
C1	The methodology for the assessment is clearly set out. It would've been useful to reference the previous 2013 report methodology where appropriate. Matrices are well used and explanations given to how effects are to be assessed. In considering significance of impacts, there is no mention of the duration of impacts or whether they are temporary or permanent. This should tie in with the timescales in the temporal scope (section 2.2.2.).	A reference to the 2013 report methodology will be made within the Environmental Report. In considering the temporal scope, there are two aspects to consider. The temporal scope of the plan, which is discussed in Section 2.2.2. The temporal scope of the impact, however, is covered in Section 5.2, and specifically, the duration and permanence of the impacts are clearly discussed within the assessment framework table, an example of which shown in Table 5.2. Duration and permanence are considered when assessing the magnitude of impacts for each objective.
C2	The baseline information is sufficient to provide an understanding of the existing environment and its likely evolution within the study area (under separate future baseline headings). It provides a generic picture across the area but does not reference the 2013 SEA report or changes since then. It would've been useful for this section to be more focused on those locations where impacts are likely to occur had an outline of the reasonable alternatives been included in the report. As the study area is so large it might be useful to focus the scope on where the impacts are likely to occur.	Baseline information comes out of national, regional and local information available information at the time, and has been updated since the 2013 SEA. The Environmental Report will refer to the 2013 SEA, and include a more detailed assessment of each feasible option. Site-specific baseline information will be included in the WFD, HRA and overarching SEA assessments presented in the Environmental Report.
СЗ	It is not very clear which alternatives are being assessed, and therefore the likely spatial distribution of environmental effects (in addition to performance against objectives). Consider whether the assessment methodology could be modified to provide greater clarity on the spatial distribution of the environmental effects of the plan rather than just the performance against objectives.	The list of feasible options that will be assessed was not finalised at the time of the SEA Scoping Report. The alternatives assessed will be detailed within the HRA and WFD screening reports, and the Environmental Report. A completed appraisal framework table for each option, alternative programmes and the overall WRMP will be presented in full in an appendix to the Environmental Report.

Table A1 Environment Agency comments on SEA Scoping Report

Yorkshire Water WRMP2019

Envir	onment Agency comments	Yorkshire Water response
C4	Given there are previous plans and previous strategic environmental assessments for the WRMP, it would have been helpful to have included a summary of the environmental effects of previous plans. This may have helped to further focus the scope of the assessment on the likely significant effects born from experience. Consider whether scope of the assessment can be further refined.	Previous plans and assessments for the WRMP will be referenced within the Environmental Report where relevant. No options presented in the 2014 WRMP have been implemented and thus the effects cannot be included at this time. However, a small amount of active leakage control (0- 10MI/d) will be implemented in Year 4 and 5 of this AMP.

Table A2 Natural England comments on SEA Scoping Report

Natural England comments		Yorkshire Water response
C5	The WRMPs temporal scope discussed in the SEA scoping report recognises it to be a minimum timeframe of 25 years and explains that WRMP cycles will review options and effects every 5 years (section 2.2.2). What isn't clearly explained is the actual temporal scope the SEA will assess effects of options for their sustainability (ie. 5/25/25+years), even though future WRMP cycles may also assess options planned beyond 2024.	The SEA assesses the long term sustainability of the WRMP, i.e. 25 years, but as stated will be updated every 5 years. This will be clarified in the text. Future WRMP cycles will revisit options beyond 2024 and the SEA will be updated at that time. The current SEA covers the full duration of the current WRMP, i.e. 2019-2044.
C6	The description of uncertainty about future baseline and the methodology used to assess effects of options on this future baseline (section 2.2.2) was initially confusing to us, initially thinking it related to the UKCP09 predicted emissions scenarios based on the 2007 baseline. The general concept of this section of assessment explained in the meeting (05/06/17) and subsequent email (12/06/17) clarified this misunderstanding. However further to this, it's still unclear to us what the methodology of the assessment is around adopting the scenario, identifying a central estimate and the degree of uncertainty from the central estimate of a future environmental and social baseline and if this will be recorded in the assessment. The area of forecasting how the natural environment will change / look like in 2100 attracts a degree of uncertainty and reliance on datasets from others to inform SEA can be old. We appreciate this leaves a degree of residual uncertainty when assessing effects of proposed options, together with any specific concerns about local data. We recommend significant residual uncertainty is captured in the Certainty option of the appraisal framework. Also we're not sure how the proposed 'central estimate' fits with the following two points to assess how proposed WRMP options may affect this future baseline 'medium scenario' from the CCRA (2012) of identified risks and more detailed review of threats and opportunities to the natural environment (section 4.7.2): and the EA Water	Significant residual uncertainty for any options/topics will be captured in the certainty column of the appraisal framework. In line with the current WRMP, and following guidance from the Environment Agency, the climate change scenarios presented in the Impact of Climate Change on Demand (UKWIR, 2012) will be used to determine the potential impact of climate change on customer demand. The demand forecast for WRMP2019 includes an uplift due to climate change. The strategic nature of the SEA precludes assessment of other climate change scenarios (e.g. CCRA (2012) and EA Water Resources Strategy (2009)) at the option level, however we will review these documents and evaluate whether any amendments should be made to the future baseline.

Natur	al England comments	Yorkshire Water response
	Resources Strategy (2009) of scenarios of potential demand, changes in rainfall recharge to groundwater and runoff rates and potential of summer river flows to be reduced by 80%.	
C7	The SEA could assess the influence of the dWRMP options influence to habitat vulnerability and biodiversity's ability to adapt to increased water resource pressures and explore environmental opportunities to adapt this environmental pressure that affects water supply sources (e.g. long-term resilience for water supply in Esk catchment, East SWZ). This would help the SEAs role to assist with wider cumulative effects between options and promote consideration of range of benefits and impacts. To understand the vulnerabilities of priority habitats to climate change and additional effects of dWRMP options, the SEA may wish to consider the National biodiversity climate change vulnerability model NERR054 to support decision making. This vulnerability mapping is an easy to use assessment of the relative vulnerability of priority habitats to climate change, including sensitivity, adaptive capacity, asset value and overall vulnerability to help guide interventions which can increase their resilience.	The vulnerability tool was assessed for the Yorkshire area. However, the model is too detailed for the high- level assessment required for an SEA, with a range of vulnerabilities surrounding the options. Therefore, an overall vulnerability could not be ascertained at a strategic level.
C8	Some more detail is needed to better understand and justify the basis of the 10km study area in the Tyne and Tees catchments and how hydrological connectivity is accounted for in the screening criteria. As highlighted in the recent meeting (05/06/17) the SSSI Impact Risk Zone (IRZ) datasets are available from data.gov.uk and can be viewed on magic. These help developers and applicants make rapid initial assessment of potential risks from their project/plan proposals and guide their consultation with Natural England. We regularly review IRZs to ensure they reflect our current understanding of specific site sensitivities and potential risks posed to SSSIs. Where the notified features of a European site and SSSI are different, the SSSI IRZs have been set so that they reflect both. The SSSI IRZs can be used as part of a Habitats Regulations Assessment (HRA) to help determine whether there are likely to be significant effects from a particular development on the interest features of the European site	Evaluation of impacts on SSSIs will include consideration of Impact Risk Zones (IRZ). The 10km buffer is sufficient for impacts associated with pipeline options in the Tyne and Tees catchments. We will ensure that the assessments include impacts beyond this buffer for river transfer options where hydrological connectivity with other water resources is a potential issue.
C9	Generally, Table 3.1 and Table A1 seems a thorough review of plans and policies relevant to this SEA. References to Site Improvement Plans (SIPs), SSSI conservation objectives and condition, green infrastructure, Local wildlife site information, and Natural England's standing advice would be beneficial.	Table 3.1 and Table A1 will be updated as suggested. However, information on Local Wildlife Sites will be limited to spatial location only, subject to availability. Acquisition of detailed information on Local Wildlife Sites would occur during project-level EIA preparation.

Natur	al England comments	Yorkshire Water response
C10	 4.1 The reference to Pevensey Levels WLMP in Table A1 should be removed. Additional sources of information to help to understand current baseline conditions we recommend you consider: Site improvement plans for SAC and SPAs available from our website APIS (Air Pollution Information System) http://www.apis.ac.uk/ Any relevant water cycle studies Countryside stewardship Outputs from research studies and innovative solutions which may help assess future baseline The national conservation-21 conservation strategy The 5 point plan to salmon conservation in the UK Please also note information and links provided elsewhere in this response. 	The reference to Pevensey Levels WLMP in Table A1 will be removed Site improvement plans for SAC and SPAs (i.e. Natura 2000 sites) are already referred to in Table A1. The Air Pollution Information System provides detailed data on the sensitivity of habitats and species to air quality issues (e.g. nitrogen deposition) within SACs and SPAs. This information is too detailed for the SEA, but would be useful for option EIAs. Impacts on SACs and SPAs have been assessed through HRA screening and will be used to inform the SEA. We are not aware of any relevant water cycle studies for the SEA study area. Relevant countryside stewardship information will be incorporated into the baseline The national conservation-21 conservation strategy will be incorporated into the baseline. The 5 point plan to salmon conservation in the UK will be incorporated into the baseline.
C11	There is an inconsistency in detail of information between sections used in the environmental baseline, which will affect the assessment framework use of comparable baseline information to measure potential significant effects of WRMP options. The Biodiversity, Flora and Fauna section (4.2) identifies quantity of designated sites and location whereas in Water surface water (section 4.5) it identifies quantity and quality i.e. it goes further to identify the status of a surface water resource availability and catchment classification statistics (GES/GEP) for each catchment. We recommend that the SEA environmental baseline uses overarching condition of SSSIs in the supply area (percentage in favourable condition percent of area in condition) as a better baseline comparator rather than overall number of designated sites. We recommend that the assessment methodology includes screening by designation and sensitive features SSSI conservation objectives and condition assessments to assess potential impacts; these can be viewed online one the Designated Sites view database or NE can provide if	The assessment will consider SSSI conservation objectives and condition assessments. Please provide this information in a GIS compatible format.

Natur	al England comments	Yorkshire Water response
	requested. This comment may also be relevant to Question 6.	
C12	Further information is available for relevant designated sites including local SSSI restoration plans for other SSSIs that could be identified in Table A1 (e.g. River Hull headwaters River restoration plan, Hornsea mere WLMP in process) to inform the assessment framework methodology. If required, please contact me.	Restoration plans for SSSIs would be considered during EIA preparation for individual options.
C13	Designated MCZs, confirmed in Tranche 2 along the Yorkshire coast are Holderness Inshore MCZ and Runswick Bay MCZ, should be considered by the WRMP SEA if there is potential capability of affecting protected features of those MCZs. Conservation advice on marine protected areas and guidance on how to use this advice can be found on gov.uk website, please note advice for all sites is not yet available. EA are undertaking a national data gathering and scoping exercise of existing regulated Water Company assets and identifying initial risks.	The MCZ has been considered as part of the HRA screening which is used to inform the SEA. The Runswick Bay MCZ will not be impacted by any of the feasible options. Only the Tees-Swale transfer will be associated with this MCZ but the site is located 50km from the abstraction point. The Holderness Inshore MCZ is located near the Humber Estuary. The site is designated for the various marine habitats and is not likely to be impacted by any abstractions on the River Ouse.
C14	We previously queried the scope of the SEA to include and assess Local Wildlife Sites (LWS) in a recent meeting (05/06/17). Natural England do not endorse the exclusion of the assessment of environmental features that we may not have responsibility for (e.g. LWS). The SEA regulations, set out in an annex, state what the criteria for determining a likely significant effect will be. This criterion isn't based on a 'national hierarchy' of the importance of the sites, but instead focuses on the nature of the development (a series of individual options) and the probability and nature of the effects on identified environmental features. To meet the requirements of the Directive for assessing Likely significant effects on flora and fauna we suggest the SEA cannot exclude an assessment of LWSs and ask YW to reconsider how LWS are incorporated into the assessment, we note Appendix B identifies the location of LWS/LNRs. If the proposal site is on or adjacent to a local site, e.g. Local Wildlife Site, Regionally Important Geological/Geomorphological Site (RIGS) or Local Nature Reserve (LNR) the authority should ensure it has sufficient information to fully understand the impact of the proposal on the local site.	Appendix B identifies the location of LNRs, not LWSs. We will identify LWS in proximity to the options subject to availability of suitable data-sets. However, gathering of detailed information regarding LWSs would be conducted during preparation of project-level EIAs.
C15	Natural England welcome site proposals which seeks to maximise and enhance the creation of suitable priority habitat in accordance with local priorities.	Opportunities for habitat enhancement will be noted in the SEA commentary for individual

Natur	al England comments	Yorkshire Water response
	Along with other designated sites, LWS' and Priority habitats offer potential opportunity to link ecological assets thereby deliver Lawton Principles as indicated in the Future baseline of Biodiversity, Flora and Fauna (section 4.2.2); not considering local wildlife sites in the SEA may also limit an understanding of the extent of (positive/negative) effects WRMP options could potentially have to the future baseline.	options where relevant. However, detailed restoration/enhancement plans would be developed when project-level EIAs are prepared.
C17	We welcome the reference made to National Character Areas (NCAs) throughout the SEA scoping document (Table 4.3 and 4.4 and section 4.9). We recommend further information is used to inform key messages for relevant NCAs, help establish a landscape baseline and guide local assessment of potential effects of WRMP options to a landscapes sensitivity and its capacity to accommodate proposals. This includes include Countryside Quality Counts (CQC) Countryside Quality Counts (CQC), National Character Area Statements of environmental opportunity, relevant local authority landscape character assessment where available and policies protecting landscape character in local plan or development framework. This comment may also be relevant to Question 6.	A strategic and high-level approach will be taken to the landscape and visual amenity assessment, considering designations such as AONBs and National Character Areas as appropriate. It is not considered that a detailed assessment (as undertaken as part of an Environmental Impact Assessment) is required for this SEA. We note that the Countryside Quality Counts project has not been updated since 2003, any may not reflect current changes within the countryside.
C18	The current agri-environment scheme for landowners is Countryside stewardship. It encourages land managers to manage their land in an environmentally sensitive way to support objectives to improve water, historic environment and biodiversity. In terms of ESA this ended in 2004 along with the original Countryside Stewardship so the last of them would've expired in 2014.	The reference to ESA will be removed, and information regarding the countryside stewardship scheme inserted.
C19	The reference to Priority habitats (4.2.1) doesn't explain the objectives of these designations for inclusion to the detailed assessment methodology. The biodiversity objective for Priority habitat for rivers, for example, is to restore and maintain the whole river network to a more natural ecosystem function.	The objectives of priority habitat designations identified in Section 4.2.1 will be added to the baseline.
C20	Natural England does not hold comprehensive information regarding location of protected species. Protected species records should be sought from appropriate local biological records centre, nature conservation organisations, individuals or groups and consideration given to the wider context of the site in terms of habitat linkages and protected species populations in the wider area to assist in the impact assessment. We recognise the scoping report list of priority habitats and species is not exhaustive (section 4.2.1) but additional caveats should be added and the assessment of options must consider impacts on all priority habitats and species potentially impacted upon not just this illustrative list. Additional	Gathering of detailed information regarding the location of protected species would be conducted during preparation of project-level EIAs. It is not the purpose of the SEA to document this level of detail.

Natur	al England comments	Yorkshire Water response
	species that reflect the species and habitat most relevant to the supply area including Freshwater pearl mussel, Sea lamprey, Great Crested Newt and Twite should be included. The Twite is also Red listed because of a long-term decline in its breeding population. More recently, there has been a substantial decline in range in the south Pennines (81% between 1990 and 2004-5). Causes of the decline are unknown but are likely to include losses of summer and winter food supplies, and suitable nesting habitat (reservoir shore margins can be suitable feeding and nesting habitat).	
C21	Natural England has published Standing Advice on protected species, it includes - a habitat decision tree which provides advice to planners on deciding if there is a 'reasonable likelihood' of protected species being present	Standing Advice on protected species would be considered during preparation of project-level EIAs. It is not the purpose of the SEA to document this level of detail.
	- detailed advice on the protected species most often affected by development, including flow charts for individual species to enable an assessment to be made of a protected species survey	
	- Guidance on survey and mitigation	
	Standing Advice should be treated in the same way as any individual response received from Natural England following consultation. The Standing Advice should not be treated as giving any indication or providing any assurance in respect of European Protected Species (EPS) that the proposed development is unlikely to affect the EPS present on the site; nor should it be interpreted as meaning that Natural England has reached any views as to whether a licence may be granted.	
C22	As well as considering the widespread presence and threat of Invasive Non-native species (INNS) it is valuable if the SEA identifies areas / locations free of INNS that may be more prone/sensitive to relevant WRMP related activity where preventing introduction of INNS is an important objective.	Closer consideration of INNS threats will be carried out during EIA of options carried forward and implemented. It is not the purpose of the SEA to document this level of detail.
C23	The key Lawton principles of bigger, better, more, joined habitats and species are included as a key parameter in future baseline of Biodiversity, Flora and Fauna (section 4.2.2) and we suggest these are also included in the Key messages (Table 3.1). The SEA should assess the dWRMPs potential to reduce water abstractions in future as environmental pressures become more acute in face of climate change. Natural England place a lot of emphasis to encourage others to look for opportunities to preserve and enhance our natural environment for the long term. This aligns with the duty of water undertakers to 'further water conservation' (Water Act 2003) and	Table 3.1 will be updated with the key Lawton principles. Innovative approaches to integrating biodiversity conservation and water management will be considered in the YWSL Business Plan and the WRMP, however, these are at the early stages of the planning cycle. Detailed mitigation plans (including habitat restoration and/or creation) will be developed at the time of project-level EIAs.

Natural England comments		Yorkshire Water response
	toward biodiversity (NERC 2006), the Defra strategy for the Environment creating a great place for living and Biodiversity 2020 outcomes. Natural England encourage the SEA to identify and integrate opportunities into the WRMP options to deliver the Lawton principles (bigger, better, more and joined up) and support landscape scale conservation towards a net gain in the value of nature. This includes the contribution that Green Infrastructure, multifunctional/multi-benefits network of functionally designed green spaces, can make to help adapt a strategic framework to identify water supply needs, linking into green infrastructure strategies and action plans; Or potential for priority habitat restoration or creation as part of WRMP options to enhance ecological assets and their linkage; Or ways to better manage YW owned land assets in a multifunctional way to grow natural capital; Or working with others to influence greater water conservation in different sectors such as agriculture.	
C24	We encourage the scope of monitoring proposals in the environmental report to anticipate potential effects when the WRMP is implemented, such as predicted significance is inaccurate, mitigation and enhancement ineffective or change to circumstances that affect assumptions made. A monitoring plan can reduce the possibility of these effects occurring, ensure mitigation and enhancement are effective, checks whether unforeseen impacts are occurring, address gaps in the data or uncertainty highlighted by the assessment and provide a more comprehensive baseline for future WRMPs. Please also see comments to Question 5 &6.	Outline monitoring plans will be provided in the SEA, however detailed monitoring plans would be prepared at the time of project-level EIAs.

Table A3 Historic England comments on SEA Scoping Report

Com	ments from Historic England	Yorkshire Water Response
C25	Overall, we consider that the Report has identified the majority of plans and programmes which are likely to be of relevance to the development of the Plan insofar as it affects the historic environment. However, the list of Plans and Programmes that have been reviewed should be amended as follows: <i>International</i> The list of International Plans and Programmes has the	Repeat of <i>European Landscape</i> <i>Convention</i> listing will be removed from the list of international plans. Record of Historic England's <i>Heritage at Risk Register</i> in the list of national plans will be updated to reflect the most recent version.
	National	DCMS The historic environment – A Force for the Future will be
	Historic England's Heritage at Risk Register is updated annually. The most recent update was in 2016.	removed from the list of nationa plans.

Com	ments from Historic England	Yorkshire Water Response
	DCMS The historic environment – A Force for the Future is now over 16 years old and its provisions have been superseded by subsequent Government Policies. Therefore, this can be deleted.	East Midlands and the North West <i>Heritage at Risk Registers</i> will be added to the list of regional plans.
	Regional Historic England's Regional Heritage at Risk Registers	
	are updated annually. The most recent updates were in 2016. For completeness, the list ought also to include those for the East Midlands and the North West.	
C26	Consideration should also be had to the following:	World Heritage Sites within the
	International	baseline, the provisions of the
	There are several World Heritage Sites within the area of this Plan. Therefore, consideration also needs to be had	UNESCO World Heritage Convention will be considered.
	to the provisions of the UNESCO World Heritage Convention. This can be found at: <u>http://whc.unesco.org/en/conventiontext/</u>	The European Convention on the Protection of Archaeological Heritage (Valetta Convention)
	The European Convention on the Protection of Archaeological Heritage (Valetta Convention). This can be found at: <u>https://rm.coe.int/168007bd25</u>	will be added to the list of international plans for consideration.
	Regional	Relevant adopted Local Plans
	The list of Local Plan does not include all the Adopted Local Plans which cover this area.	for the study area will be included in the list of regional plans for consideration.
	The World Heritage Site Management Plans for Saltaire, Fountains Abbey/Studley Royal and Hadrian's Wall also need to be considered. These can be found at:	World Heritage Site Management Plans for Saltaire, Fountains Abbey/Studley Royal
	Saltaire:	and Hadrian's Wall will be
	https://www.bradford.gov.uk/media/3341/saltaire-world- heritage-sitemanagement-plan2014-v2.pdf	However, we note that Hadrian's Wall is some distance from the
	Fountains Abbey/Studley Royal:	Tees-Swale transfer.
	https://www.nationaltrust.org.uk/fountains-abbey-and- studley-royalwater-garden/documents/download-the-full- draft-management-plan.pdf	
	Hadrian's Wall:	
	http://hadrianswallcountry.co.uk/hadrians-wall- management-plan	
C27	We consider that the Report has established an appropriate baseline insofar as the historic environment is concerned. The only aspects which you might consider amending are as follows:	It should be noted that the SEA Scoping Report will not be re- issued, but comments provided will be taken into consideration in propagation of the
	Section 4.8.1, fourth Paragraph, line 2 – Not all nationally- important archaeological sites are protected as designated heritage assets. The schedule of Scheduled Monuments, which is compiled by the Secretary of State, is a representative sample of the most important archaeological remains.	in preparation of the environmental report. Your comment regarding the wording of Section 4.8.1, fourth Paragraph, line 2 will be reflected in the text of the final SEA Environmental Report.
	inererore, it would be preferable to state:	

Comr	ments from Historic England	Yorkshire Water Response
	"The most-important archaeological remains are designated as Scheduled Monuments". Section 4.1.8, Paragraph following Table 4.13 – It would be helpful to set out the numbers of designated heritage assets at risk. These can be found at:	Percentages and trends regarding designated heritage assets at risk will be added to the Environmental Report.
	assets at risk. These can be found at: Yorkshire: https://content.historicengland.org.uk/images- books/publications/har-2016-registers/yo-har- register2016.pdf/ North East: https://content.historicengland.org.uk/images- books/publications/har-2016-registers/ne-har- register2016.pdf/ East Midlands: https://content.historicengland.org.uk/images- books/publications/har-2016-registers/em-har- register2016.pdf/ North West: https://content.historicengland.org.uk/images- books/publications/har-2016-registers/em-har- register2016.pdf/	
C28	If you have not already done so, it would be worth consulting the Conservation Sections and archaeological staff of the various local planning authorities throughout the preparation of the SEA of the plan. They are best placed to advise on; local historic environment issues and priorities, including access to data held in the HER (formerly SMR); 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 historic assets.	In response to your query as to whether Yorkshire Water will consult with the Conservation Sections and archaeological staff of the various planning authorities through the preparation of the plan, it should be noted that the SEA is a high- level assessment aimed at highlighting potential environmental concerns, associated with plans and programmes at a strategic level. Only the statutory consultation bodies as defined in the Environmental Assessment of Plans and Programmes Regulations 2004, have therefore been consulted at this stage. At a later stage, during the implementation of WRMP options, any major schemes that have the potential to give rise to likely significant environmental effects would be subject to a more detailed Environmental Impact Assessment at a project

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Comments from Historic England	Yorkshire Water Response
	Conservation Sections and archaeological staff of the various planning authorities, as part of a much wider consultation process.

Appendix B Quality assurance checklist

ODPM Guidance¹ 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 B1, indicating where this Environmental Report meets the requirements.

Table B1	Quality	Assurance	Checklist
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Checklist item	Comments	
Objectives and context		
The plan's or programme's purpose and objectives are made clear.	The purpose of the WRMP 2019 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 of this Environmental Report.	
SEA objectives, where used, are clearly set out and linked to indicators and targets where appropriate.	SEA 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 with other related plans, programmes and policies 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	Interactions between SEA objectives are identified in Section 5.1.1, and compatibility conflicts with other plans have been identified as part of the cumulative assessment presented in Section 8 of the Environment Report.	
Scoping		
Consultation Bodies are consulted in appropriate ways and at appropriate times on the content and scope of the 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 was undertaken on the SEA Scoping Report and on the draft WRMP. The consultation process is described in Section 1.6 of the Environmental Report.	

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

Checklist item	Comments
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.	Study limitations are set out in Section 5.3 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.
Alternatives	
Realistic alternatives are considered for key issues, and the reasons for choosing them are documented.	The WRMP considers a range of options/alternatives (described further in Section 2 of this report). SEA plays an important role in options appraisal process. Options which are found by the SEA to have unacceptable potential impacts have been rejected from the options pool and have not reached the constrained list, from which the initial Least Cost programme is selected. This is documented in Section 2 of this Environmental Report.
Alternatives include 'do minimum' and/or 'business as usual' scenarios wherever relevant.	Feasible options are presented in Section 2, and alternative programmes are discussed in Section 8 of this Environmental Report. However, assessment of 'do minimum' and/or 'business as usual' programmes are not considered appropriate with respect to the WRMP SEA.
The environmental effects (both adverse and beneficial) of each alternative are identified and compared.	Assessment of environmental effects (both adverse and beneficial) of all feasible options has been undertaken and is presented in Section 7 of this Environmental Report.
Inconsistencies between the alternatives and other relevant plans, programmes or policies are identified and explained.	Cumulative effects between the preferred programme and other relevant plans, programmes or policies have been identified and are discussed in Section 8 of this Environmental Report.
Reasons are given for selection or elimination of alternatives.	The WRMP and Section 8 of this Environmental Report document the reasons for selection of the preferred programme and elimination of alternative programmes.
Baseline information	

Checklist item	Comments	
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 D of this Environmental 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 Yorkshire Water's water supply area, and bordering regions where appropriate, are described in Section 4 and Appendix D of this Environmental Report.	
Difficulties such as deficiencies in information or methods are explained.	Difficulties and limitations are set out in Section 5.3 and Appendix D of this Environmental Report.	
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 are set out in Sections 6, 7 and 8 of this 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 Section 7 of this Environmental Report, using an appraisal framework set out in Section 5.	
Likely secondary, cumulative and synergistic effects are identified where practicable.	These effects are identified in Sections 7 and 8 of this Environmental Report.	
Inter-relationships between effects are considered where practicable.	These are considered in the Environmental Report alongside cumulative effects.	
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.	
Methods used to evaluate the effects are described.	Methods used to evaluate the effects are described in Section 5 of this Environmental Report.	
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 are outlined in Section 9 of this Environmental Report.	
Issues to be considered in project delivery.	Effects, mitigation and monitoring identified through the SEA will inform more detailed option-level assessments such as EIA.	

Checklist item	Comments
The Environmental Report	
Is clear and concise in its layout and presentation.	The Environmental Report is clear and concise.
Uses simple, clear language and avoids or explains technical terms.	The Environmental Report uses simple, clear language, and explain technical terms, as appropriate.
Uses maps and other illustrations where appropriate.	The Environmental Report uses maps and illustrations where appropriate.
Explains the methodology used.	SEA methodology is described in Section 5 of this Environmental Report
Explains who was consulted and what methods of consultation were used.	The consultation strategy, including organisations and dates of consultation have been included in Section 1.6 of this Environmental Report.
Identifies sources of information, including expert judgement and matters of opinion.	Sources of information have been detailed throughout this 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 includes 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 comply with the SEA Directive, and has been circulated to statutory consultees and will be published on the Yorkshire Water website. Previous consultation has also been undertaken on the Scoping Report.
	The consultation process is described in Section 1.6 of this Environmental Report.
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 comply with the SEA Directive, and has been circulated to statutory consultees and will be published on the Yorkshire Water website. Previous consultation has also been undertaken on the Scoping Report.
	The consultation process is described in Section 1.6 of this Environmental Report.
Decision-making and information on the decision	

Checklist item	Comments	
The environmental report and the opinions of those consulted are considered in finalising and adopting the plan or programme.	Representations made on the draft WRMP have been addressed in preparing the final WRMP.	
An explanation is given of how they have been considered.	A Statement of Response to the representations will be produced and made publicly available.	
Reasons are given for choosing the plan or programme as adopted, in the light of other reasonable alternatives considered.	On adoption of the final WRMP, after approval by the regulators, Yorkshire Water will prepare a Post-Adoption Statement setting out how the SEA and any views expressed by the consultation bodies or the public have influenced the WRMP.	
Monitoring measures		
Measures proposed for monitoring are clear, practicable and linked to the indicators and objectives used in the SEA.	The Environmental Report includes a proposed approach to monitoring in Section 9. Detailed monitoring programmes would be developed for individual options when they are implemented.	
Monitoring is used, where appropriate, during implementation of the plan or programme to make good deficiencies in baseline information in the SEA.	The Environmental Report includes a proposed approach to monitoring in Section 10. Detailed monitoring programmes would be developed for individual options when they are implemented.	
Monitoring enables unforeseen adverse effects to be identified at an early stage. (These effects may include predictions which prove to be incorrect.)	The Environmental Report includes a proposed approach to monitoring in Section 10. Detailed monitoring programmes would be developed for individual options when they are implemented.	
Proposals are made for action in response to significant adverse effects.	The approach to mitigation for adverse effects have been identified in Section 9 of this 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 C1. 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 C1 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		
The Bern Convention on the Conservation of European Wild	dlife 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.	
The Cancun Agreement (2011) & Kyoto Agreement (1997)		
The agreements 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.	
The Convention for the protection of the architectural heritage of Europe (Granada Convention)		
This sets the framework for the approach to conservation across Europe.	The SEA should consider the need to conserve heritage.	
Council of Europe (2003) European Soils Charter		
Sets out common principles for protecting soils across the EU and will help.	The SEA should seek to ensure that the quality of the regions land, including soils, is protected or enhanced.	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
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	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.	
by the public		
The Environment Noise Directive (Directive 2002/40/EC)		
The Environment Noise Directive (Directive 2002/49/EC)		
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 (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 Commission (2009), Birds Directive (2009/147/EC)		
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 (in the UK delivery is via several different statutes).	The SEA should seek to protect and conserve important bird habitats.	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
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 participation procedures in the preparation of these plans.	The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the WRMP.	
European Commission (2006) Fresh Water Fish Directive (2	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	The SEA should seek to promote the protection of river and lake water quality to maintain and develop suitable environments that will sustain fresh water fish populations.	
quality of rivers and lakes to encourage healthy fish populations.		
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; 	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	
 Minimum measures to prevent diseases in aquaculture animals; 	biodiversity.	
 Minimum measures to be taken in response to suspected or established cases of certain diseases in aquatic animals. 		
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 Direc	tive (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.	The SEA should seek to promote the protection and enhancement of all water resources.	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
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.		
European Commission, Drinking Water Directive (1998/83/E	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 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 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.	
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 the wetlands in their territories.	The impacts of the WRMP options on important wetland habitats must be considered as part of the SEA.	
United Nations (1992), Convention on Biological Diversity (CBD)		

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
 The main objectives are: Conservation of biological diversity Sustainable use of its components Fair and equitable sharing of benefits arising from genetic resources 	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.	
European Council (1992), The European Convention on the (Valetta Convention)	Protection of Archaeological Heritage	
The aim of this (revised) Convention is to protect the archaeological heritage as a source of the European collective memory and as an instrument for historical and scientific study.	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.	
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 	These commitments are the highest- level definitions of sustainable development. The WRMP should be influenced strongly by these themes and should seek to take its aims into account.	
 Work on waste and producer responsibility New technology development Push on energy efficiency Integrated water management plans needed 	The SEA should seek to promote the achievement of the sustainable development objectives outlined in this plan.	
• Minimise significant adverse effects on human health and the environment from chemicals by 2020.		

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
National		
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.	
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 considered by the SEA.	
Conservation of Habitats and Species Regulations 2017		
The Conservation of Habitats and Species Regulations 2017 (as amended) are the principal means by which the Habitats Directive is transposed in England and Wales 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 WRMP may influence public access to the countryside.	
The main provisions of the Act are as follows:	The SEA should include objectives	
 Extends the public's ability to enjoy the countryside whilst also providing safeguards for landowners and occupiers 	of SSSIs and the management of relevant landscape designations.	
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.		
DCLG (2012) National Planning Policy Framework		
Presumption in favour of sustainable development. Core planning principles include taking account of the 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;	The WRMP and SEA should take account of the key components of sustainable development, Also, reservoirs contribute to recreation and visual amenity.	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
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. 	
Department for Energy and Climate Change (2007) Energy Challenge	White Paper: Meeting the Energy
 Meeting the energy challenge', sets our international and domestic energy strategy, in the shape of four policy goals: Aiming to cut CO2 emissions by some 60% by about 2050, with real progress by 2020 Maintaining the reliability of energy supplies Promoting competitive markets in the UK and beyond Ensuring every home is heated adequately and affordably. 	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 secure, affordable and low carbon electricity	our electric future: A White Paper for
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 Englar	nd 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	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

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Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
which material resources are re-used, recycled or recovered wherever possible, and only disposed of as the option of very last resort.	enhance recycling and minimise the amount of waste going to landfill.	
Defra (2012) The UK Climate Change Risk Assessment 201	12 Evidence Report	
Five themes are identified that form the priorities for adaptation in the UK.	The SEA should consider 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 consider 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: Water Regulation Cultural services: Recreation and ecotourism 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. In the event of further guidance being issued on incorporating ESA into SEA, the anticipated approach is sufficiently flexible that it should be able to accommodate this (subject to timing). 	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
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 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 SEA should seek to ensure that the quality of the regions soils and their management is protected or enhanced.	
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.	
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	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.	
management of surface water		

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
Ensured a sustainable use of water resources, and implemented fair, affordable and cost-reflective charges.		
Defra (2007) The Air Quality Strategy for England, Scotland and Wales		
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 Wi	Idlife 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	e 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 considering 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 Sustainabl	e 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	The SEA must seek to ensure that objectives relating to sustainable development, sustainable resource use and protecting the natural environment, are considered when	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
protecting natural resources and enhancing the environment.	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.	
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 influence 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 (2015) The government's response to the Natural Capital Committee's third State of Natural Capital report		
This provides several 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.	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
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.	
Department for Culture, Media and Sport (2001) The Histor	ic 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.
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	The SEA should seek to ensure that priorities are also reflected in the SEA objectives particularly regarding the protection and improvement of water,
 Increasing the resilience of people, property and businesses to the risks of flooding and coastal erosion 	land and biodiversity.
• Protecting and improving 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;	The SEA should seek to ensure that strategy objectives are also reflected in the SEA objectives particularly regarding the sustainable

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
 Sustainable planning and management of water resources; People valuing water and the water environment. 	management of water resources and protecting the 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:	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.	
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		
Environment Agency (2015) Creating a Better Place: Enviro 2014-2016	onment Agency Corporate Strategy	
 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 (2013), Managing Water Abstraction		
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 SEA should seek to promote a reduction of the risks identified in the Shoreline Management Plans.	
(SMPs) are in production, covering the entire 6000		

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
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.		
Environment Agency (undated) WFD River Basin Characterisation Project: Technical Assessmen 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	or 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.	The SEA should seek to ensure that the guidance provided by the regulations is considered when assessing the WRMP.	
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 Eels (England and Wales) Regulations 2009		
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 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.	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
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.	
English Heritage, now known as Historic England (2016) He	eritage at Risk
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. Regional Heritage at Risk Registers were most recently published in 2017.	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 affordability of water bills for certain groups and individuals, and help ensure continuity of water supplies to the consumer.	The WRMP also aims to ensure continuity of water supplies across the region are maintained.
Historic England (2013) Strategic Environmental Assessme Historic Environment	nt, Sustainability Appraisal and the
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 considered in the SEA.
Historic England (2015) Historic Environment Good Practice	e 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 consider effects on settings of heritage assets.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
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 competitiveness and to improve the quality of life of everyone in the UK.	The WRMP could result in the production of additional waste. The SEA should seek to reduce the production of waste and ensure it is treated in line with the widely adopted 'waste hierarchy' and not sent to landfill. The WRMP can contribute to the providing resilient water services.	
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.'		
Natural Environment and Rural Communities Act, 2006		
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 199	0	
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		

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
 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) Regul	ations, 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 or lake, such as quantity, structure and substrate of river/lake bed. Aligns the Water Resources Act with the hydromorphological requirements of the WFD	The SEA should include objectives that cover hydromorphological aspects and seek to ensure that hydromorphological features within the plan are maintained or enhanced.	
Wildlife and Countryside Act, 1981		
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,	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	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
standards for acidity in rivers and standards in intermittent discharges.	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 UKCP09. UKCIP, 2009	
The UKCP09 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,	The WRMP does take account of UKCP09 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 UKCP09 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.
adaptation.	
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 consider this legislation.
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.
The State of the Environment: Water Resources 2018	
This provides a review and projection of the natural and anthropogenic pressures on water resources. The key findings of the report are as follows:	The WRMP should take account of the pressures on water resources highlighted in the report. The SEA should take into consideration these pressures when assessing impacts on environmental receptors.
Impacts of pressures on water resources due to increase population growth, changing climate and changes to land use.	
Abstraction, drainage and altered water levels are major causes of damage to wetlands.	
In 2017, abstraction from around 28% of groundwater bodies and up to 18% of surface waters was at higher than sustainable levels.	
Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
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In 2016, unsustainable abstraction prevented at least 6% and possibly up to 15% of river water bodies from meeting good ecological status or potential.	
Winter rainfall has increased since the mid-18th century; summer rainfall has decreased slightly over the same period.	
High winter river flows have increased over the past 30 years, with a subsequent increase in the frequency and magnitude of flooding.	
There is no clear trend in droughts, but summer river flows and groundwater levels may decrease in the future.	
Regional	
Local Plans: Calderdale, Kirklees, Barnsley, Sheffield, Roth Leeds, Bradford, Selby, York, North Lincolnshire, East Ridir Hambleton, Harrogate, Craven, Richmondshire, City of King Lincolnshire, Stockton-On-Tees, Durham, Gateshead, North	erham, Doncaster, Wakefield, Bradford, ng of Yorkshire, Ryedale, Scarborough, gston Upon Hull, North East numberland and Darlington.
A local plan sets out local planning policies and identifies how land is used, determining what will be built where. Adopted local plans provide the framework for development across England.	The SEA should take the objectives of these Local Plans into account.
Biodiversity Action Plans	
North York Moors National Park Biodiversity Action Plan 20	13-2017
Yorkshire Dales National Park Local Biodiversity Action Pla Vision'	n (LBAP) 'Nature in the Dales: 2020
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 influence BAP objectives. The SEA should include objectives that consider the objectives of the BAP where relevant (e.g. conservation designation status).
North York Moors National Park Authority (2016) Local Plan	n: First Steps
North York Moors National Park Authority are currently reviewing their Local Plan. The First Steps document sets out the framework for the final plan.	The SEA should take the objectives of this plan into account.
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.
English Heritage, now known as Historic England, Heritage Yorkshire (2017)	at Risk Registers:

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
North West (2017)		
East Midlands (2017)		
North East (2017)		
Historic England Corporate Plan 2015-2018 is reducing the risk to heritage assets.	It is unlikely the WRMP will influence the Heritage at Risk Register.	
In order to achieve this aim we are working to:		
• better understand the nature and extent of risk		
• encourage others to save and re-use heritage at risk		
• build the capacity of the sector to deliver solutions for heritage at risk		
 provide advice and grants to help remove heritage from the Register 		
Environment Agency (2016) Humber river basin district flood risk management plan 2015-2021		
Social objectives:	The WRMP may influence FRMP	
 Understanding Flood Risk and Working in Partnership 	objectives. The SEA should include objectives that consider the objectives of the FRMP where relevant (e.g.	
Community Preparedness and Resilience	WFD status).	
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		
Environment Agency, CAMS (various)	1	
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	The WRMP operation may have the potential to affect several of the CAMs objectives. The SEA will include	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
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.	objectives that consider the objectives of the CAMs where relevant.	
CAMS contribute to the WFD by:		
 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 2014 – 2019 (2014)		
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 consider 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	It is unlikely the WRMP will influence the objectives of Hadrian's Wall Management Plan.	
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		

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
Howardian Hills AONB Joint Advisory Committee, Howardia Management Plan 2014 – 2019 (2014)	an Hills Area of Natural Beauty	
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 consider the objectives of the Howardian Hills AONB management where relevant.	
Lake District National Park Authority, A Vision for 2030 (200)6)	
A prosperous economy World class visitor experiences Vibrant communities A spectacular landscape, its wildlife and cultural heritage	The WRMP may influence the National Park objectives. The SEA should include objectives that consider 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 (2014)		
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 influence the Core Strategy objectives. The SEA should include objectives that consider the objectives of Leeds Core Strategy where relevant (e.g. protecting natural habitats).	
Leeds City Region Local Authority Green Infrastructure Stra	ategies (2010)	
The plan aims to maintain and enhance green infrastructure to:Address climate change adaptation and mitigation	The SEA will take these objectives into account where the WRMP may influence green infrastructure.	

Yorkshire Water WRMP2019

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
Tackle flood alleviation and water management	
Improve quality of place	
Improve physical and mental health	
Sustain economic growth and investment	
Natural England (2014) Site Improvement Plans (SIPs) for I	Natura 2000 Sites
Site improvement plans: Yorkshire & Humber This SIP includes the priorities and new measures required to achieve water-dependent Natura 2000 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 Natura 2000 site relating to species and habitats.	The WRMP may influence Site Improvement Plans (SIPs) for Natura 2000 Sites and the Humber RBMP. The SEA should include objectives that consider the objectives of the Natura 2000 Sites and the Humber RBMP where relevant (e.g. WFD status).
Natural England National Character Area (NCA) Profiles	
There are over 20 NCAs within Yorkshire Waters operating boundary. Each of these have individual objective relating to specific landscapes, habitats and species.	The WRMP may influence NCAs. The SEA should include objectives that consider the objectives of the NCAs where relevant (e.g. manage and enhance existing babitats).
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	
Nidderdale AONB, Nidderdale Area of Outstanding Natural (2014)	Beauty Management Plan 2014 – 2019
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 consider the objectives of the Nidderdale AONB management where relevant.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
North East Local Enterprise Partnership (2014) More and Better Jobs: A strategic economic plan for the North East		
Halve the gap between the North East and the national average (excluding London) on three quantifiable measures:	Unlikely that these objectives will be effected by the objectives of the WRMP SEA.	
Gross value added (GVA) per full time equivalent (FTE), with wages and profits rewarding workers and investors and sustaining high levels of employment.		
Private sector employment density, with more companies and jobs driving a high growth economy.		
Activity rate, with no one left behind, and those distant from or disadvantaged in the labour market helped to take advantage of the opportunities created by a successful growing economy.		
Fully close the gap on one quantifiable measure:		
Employment rate, with the scale and quality of employment matching an increasingly better qualified and higher skilled workforce.		
North Pennines AONB Partnership, The North Pennines Area of Natural Beauty Management Plan 2014-2019		
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 consider 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 effects of the document on sustainability can be monitored.	The WRMP operation may have the potential to affect the of the objectives of the LDS. The SEA will include objectives that consider the objectives of the LDS where relevant.	
North York Moors Park Authority (2012) National Park Management Plan		
The Plan aims to achieve the long-standing vision for the Park:	The WRMP operation may have the potential to affect the objectives of the	
 A place managed with care and concern for future generations. 	National Park Management Plan. The SEA will include objectives that consider the objectives of the National	
 A place where the diversity and distinctiveness of the landscape, villages and buildings is cherished. 	Park Management Plan where relevant.	
• A place where biological and cultural diversity, and other special qualities are conserved and enhanced.		

Obj	ectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
•	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.	
Pea 201	k District National Park Authority (2014) Peak District Na 9	ational Park Management Plan 2014 –
DL ada and	1 Landscape The diverse national park landscapes will pt to challenges whilst retaining their special qualities natural beauty	The WRMP operation may have the potential to affect the objectives of the National Park Management Plan. The
DL 2 Cultural Heritage Our cultural heritage and distinctive local traditions will be sustained and enhanced as an integral part of modern Peak District life		SEA will include objectives that consider the objectives of the National Park Management Plan where relevant
DL 3 Biodiversity and ecosystems The richness of the natural environment will be conserved, restored and enhanced so wildlife can thrive, ecological systems continue to improve and its diverse geology is retained and valued		
DL 4 Climate Change Greenhouse gas emissions will be reduced and a healthy national park will adapt to the effects of climate change		
WI 1 Sustainable Tourism The national park will strengthen its role as a welcoming place and premier destination, synonymous with escape, adventure, enjoyment and sustainability		
WI 2 Access for all The Peak District will be an unrivalled setting for opportunities which enable people to develop a deeper understanding and appreciation of the place, and which instil a desire to contribute to the conservation, community and economy of the national park		
WI 3 Getting involved Visitors and residents will be inspired to act in a way that sustains the environment and the special qualities of the Peak District		
WI 4 opp	4 Recreation Accessible and diverse recreation ortunities will be available for all, encouraging healthy	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
living, enjoyment of the landscape and a sense of adventure	
TV 1 Sense of Place Thriving villages, hamlets and the market town of Bakewell will adapt to new challenges whilst retaining their valued historic and cultural integrity	
TV 2 Sustainable Living Communities and individuals will feel inspired to live sustainably and help shape the place they live in	
TV 3 Access to Services Residents will have sustainable access to local services and employment	
TV 4 Affordable Housing More opportunities will be found to provide locally needed affordable housing	
ES 1 Farming and Land Management Profitable farming, through food production, land management and farm based business, will promote and contribute to the special qualities of the national park, and is recognised as essential to its character and health	
ES 2 Economic Diversity There will be a diversity of thriving businesses supporting and contributing to the economy and local communities which are critical to the long term future of the national park	
ES 3 Environmental Goods The Peak District landscape will be managed by farmers and other land managers to increase the potential economic return from public goods, such as clean water, carbon storage and renewables	
ES 4 Green Economy Traditional and modern economic development that is innovative, well managed and appropriate to the landscape will be supported	
Public Rights of Way Improvement Plans (ROWIPs)	
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 consider the objectives of the ROWIPs where relevant.
Yorkshire Dales National Park Authority (2013) Yorkshire D 2013-2018	ales National Park Management Plan
 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: 	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 consider the ambitions for the management of the Yorkshire Dales National Park where relevant (e.g. landscape quality and character, historic and cultural features, babitats and biological
 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; 	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 consider the ambitions for the management of the Yorkshire Dales National Park where relevant (e.g. landscape qualit and character, historic and cultural features, habitats and biological

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives	
 Resilient and responsive to the impacts of climate change, storing more carbon each year than it produces; diversity, climate change and bett use of resources). 		
 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. 		
Yorkshire Water Services Ltd, Final Drought Plan 2010-203	5 (2014)	
See Drought Plan.	The WRMP will consider the objectives of Yorkshire Water's Drought Plan.	
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.	
Humberhead Levels Partnership (2011) Humberhead Level Plan	s Nature Improvement Area Business	
Objectives of the Plan:	The WRMP will consider the	
 Creation of key habitats of the inner estuary in additional sites 	objectives of the plan.	
 Achieve sustainable water management in an arable landscape through enhancement of riparian habitats along connecting rivers and drains. 		
 Increase the hydrological integrity of England's largest lowland mire system. 		
 Deliver sustainable management of existing biodiversity assets via developing the local green economy 		
 Increase community links to biodiversity sites to raise voluntary support for site 		
6. Management, heritage conservation and interpretation		
Local		
WRMPs from adjacent water companies		
These include:	The WRMP and SEA to take these	
Anglian Water	into account.	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP and the SEA objectives
Northumbrian Water	
Severn Trent Water	
United Utilities	
River Restoration and Water Level Management Plans	
Natural England (2013) Restoring the River Wharfe SSSI: A River Restoration Plan	The WRMP may influence River Restoration Plans for non-Natura
Natural England (2010) Restoring the Yorkshire Derwent	2000 sites. The SEA should include objectives that consider the objectives
Environment Agency (2006) Pevensey Levels SSSI: Water Level Management Plan	of these sites where relevant.

Appendix D – Environmental Baseline

1 Biodiversity, Fauna and Flora

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 D1). Special Protection Areas (SPA)², Special Areas of Conservation (SAC)³ and Ramsar⁴ sites that could be affected by implementation of the WRMP are listed in Table D1.

There are 37 Sites of Special Scientific Interest (SSSI)⁵ (these are also shown on Figure D1) that could potentially be adversely affected by the plan. Of these sites 47% are in favourable condition, 47% are in unfavourable – recovering condition and 6% are in unfavourable – declining condition. Table D2 provides the names of these sites and their condition⁶.

Site	Potential threats relevant to WRMP2019
SPA	
North York Moors	Air pollution (impacts of atmospheric nitrogen deposition).
Hornsea Mere	Water pollution, siltation and inappropriate water levels.
Lower Derwent Valley	Hydrological changes, drainage and public access/disturbance.
North Pennine Moors	Change in land management.
Peak District Moors (South Pennine Moors Phase 1)	Inappropriate management practices and public access/disturbance.
Humber Estuary	Water Pollution, coastal squeeze, direct land take from threat development and fisheries (commercial).
South Pennine Moors Phase 2	Inappropriate management practices and public access/ disturbance.

Table D1 Special Protection Areas, Special Areas of Conservation and Ramsar sites that could be affected by implementation of the WRMP

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 Based on the dominant condition of each site from Natural England's SSSI condition assessment reports available online: https://designatedsites.naturalengland.org.uk/

Site	Potential threats relevant to WRMP2019
Thorne & Hatfield Moors	Drainage, peat extraction and planning permission.
North Pennine Moors	Change in land management.
Bowland Fells	Changes in species distribution, changes in land management, hydrological changes and public access/disturbance.
Teesmouth & Cleveland Coast	Physical modification, direct land take from development, water pollution and change to site.
	Conditions and inappropriate water levels.
SAC	
Moor House – Upper Teesdale	Direct land take for development, change in land management and hydrological changes.
Lower Derwent Valley	Hydrological changes, drainage and public access/disturbance.
Strensall Common	Public access/disturbance and inappropriate scrub control.
North Pennine Moors	Change in land management.
River Derwent	Physical modification of rivers, water pollution, water abstraction and changes in land management.
Kirk Deighton	Changes in land management.
North York Moors	Climate change, planning permission: other mineral and waste and agriculture.
Skipwith Common	Drainage and public access/disturbance.
North Pennine Dales Meadows	Impacts would be related to the physical loss of habitat and damage to habitat related to construction.
South Pennine Moors	Inappropriate management practices, public access/disturbance and hydrological changes
Denby Grange Colliery Ponds	Hydrological changes, water pollution, forestry and woodland management and habitat fragmentation.
Thorne Moor	Drainage, peat extraction and planning permission general.
Humber Estuary	Water pollution, coastal squeeze, direct land take from threat development and fisheries (commercial).
Rochdale Canal	Physical modification.
North Pennines Dales Meadows	Hydrological changes, drainage and change in land management.
North Pennines Moors	Change in land management and hydrological changes.

Site	Potential threats relevant to WRMP2019			
Ingleborough Complex	Hydrological changes and changes in land management.			
Ramsar				
Humber Estuary	Water pollution, coastal squeeze and direct land take from development.			
Lower Derwent Valley	Hydrological changes, drainage and public access/disturbance.			
Teesmouth & Cleveland Coast	Physical modification, direct land take from development, water pollution, change to site conditions and inappropriate water levels.			

Table D2	Sites of S	pecial Scientific	Interest that	could be	affected by	im	plementation	of	the	WRMP

SSSI name	Site condition
Dark Peak	Unfavourable Recovering
Rake Dike	Favourable
Raincliffe & Forge Valley Woods	Favourable
Betton Farm Quarries	Favourable
Spiker's Hill Quarry	Unfavourable Recovering
Fulford Ings	Unfavourable Recovering
Naburn Marsh	Unfavourable Recovering
Aubert Ings	Favourable
Linton Common	Unfavourable Declining
East Keswick Fitts	Favourable
Eccup Reservoir	Favourable
Hetchell Wood	Favourable
River Derwent	Unfavourable Recovering
Humber Estuary	Unfavourable Recovering
Barn Hill Meadows	Favourable
Breighton Meadows	Favourable
Swale Lakes	Unfavourable Declining
Eskamhorn Meadows	Favourable
Leeds-Liverpool Canal	Unfavourable Recovering

SSSI name	Site condition
South Pennine Moors	Unfavourable Recovering
Canyards Hills	Favourable
East Nidderdale Moors (Flamstone Pin-High Ruckles)	Unfavourable Recovering
West Nidderdale, Barden & Blubberhouses Moors	Unfavourable Recovering
Gouthwaite Reservoir	Favourable
Bingley South Bog	Unfavourable Recovering
Trench Meadows	Unfavourable Recovering
Hell Kettles	Favourable
Black Scar Quarry	Favourable
Upper Teesdale	Unfavourable Recovering
Middle Side & Stonygill Meadows	Favourable
Shipley & Great Woods	Unfavourable Recovering
Pulfin Bog	Favourable
Tophill Low	Unfavourable Recovering
Leven Canal	Unfavourable Recovering

In addition to the SSSIs listed above, there are 12 National Nature Reserves (NNRs)⁷ and 134 Local Nature Reserves (LNRs)⁸ within the SEA Study Area. Figure D2 identifies NNRs and LNRs together with areas of Ancient Woodland.

There are a range of designated Natural Environment and Rural Communities (NERC) Act Section 41 habitats within the Yorkshire Water supply area⁹. 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

⁷ 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.

⁸ an 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.

⁹ Defra (accessed May 2017) MAGIC Interactive map: Habitat Inventories (http://magic.defra.gov.uk/)

- River lamprey
- White clawed crayfish
- Snakeshead Fritillary
- Loddon Lilly
- Creeping Marshwort
- Narrow-leaved water-dropwort
- 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**

In addition to the priority NERC species above, there are standalone species conservation plans that should be considered. An example is the Angling Trust's Salmon Five-Point Approach plan¹⁰ for salmon conservation in the UK. It sets out the necessary actions and measures to restore the abundance, diversity and resilience of salmon stocks in England, due to their underlying importance as an iconic indicator of the health of the water environment and as a protected species.

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 Tables D3 and D4.

¹⁰ The Angling Trust (2016). Salmon Five Point Approach – restoring salmon in Englanf. [Online]. Available from: <u>http://www.anglingtrust.net/core/core_picker/download.asp?id=7320&filetitle=Salmon+Five+Point+Approach</u> [Accessed 3 November 2017].

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.

Table D3	Designated sites in the Yorkshire Water Supply Area

Natural Area	WRZ	Region	Key Features
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.
North York Moors and Hills	Grid; East SW, East GW	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 SW, East GW	Yorkshire	Floodplain grasslands (supported by the River Derwent) which are particularly important for breeding and wintering bird populations.
Yorkshire Wolds	Grid; East GW	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.

Table D4 Natural England Natural Areas within the Tees-Swale Corridor

Natural Area	WRZ	Region	Key Messages
Holderness	Grid; East GW	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

Natural Area	WRZ	Region	Key Messages
			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 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. 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. Nonetheless, 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 3.1.

1.1.2 Works being undertaken to demonstrate compliance with the Eel Regulations

During AMP5 (2010-2015) the Environment Agency have reviewed the compliance of relevant assets such as river intakes, against the 2009 Eels Regulations, which seek to reverse the rapid decline in eel populations over recent years. The Regulations aim to achieve 40 percent escapement of adult eels relative to the level of escapement under pristine conditions. As a result of this review, we were served notice to deliver solutions to prevent eel impingement and entrainment at three of their river intake sites as a matter of high priority (i.e. solutions delivered by 2020). Specialist aquatic and fish engineering consultants APEM Ltd were commissioned to undertake an independent review of compliance and confirmed that the intake screens at two of the sites were partially compliant with the Regulations, and therefore only relatively minor modifications were required. The schemes of work at both these sites are to be delivered during 2018/19. The third site requires a much bigger scheme to ensure compliance with the Regulations. This scheme is being investigated and designed during 2018/19, for construction during 2019/20.

No further Yorkshire Water assets have been identified as being non-compliant by the review and so no further schemes are expected to be delivered during AMP7 and beyond.

1.2 Future Baseline

As part of the post 2010 policy framework for SSSIs, Natural England has developed a trajectory to achieve the move from "recovering" into "favourable" condition with monitoring of sites to measure success.

The Natural Environment White Paper¹¹ identifies the Government's aims to work to achieve more, bigger, better and less-fragmented areas for wildlife, including no net loss of priority habitat and an increase of at least 200,000 hectares in the overall extent of priority habitats and at least 50% of SSSI to be in favourable condition, while maintaining at least 95% in favourable or recovering condition.

Natural England has also published a conservation strategy for the 21st century¹² that sets out the measures that Natural England will take to protect England's natural environments and landscapes, for the public enjoyment and ecosystem services that they provide.

¹¹ Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White Paper.

¹² Natural England (2016). Conservation 21: Natural England's conservation strategy for the 21st century. [Online]. Available from: <u>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/562046/conservation-21.pdf</u> [Accessed 3 November 2017].





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.

2 Population and human health

2.1 Baseline

2.1.1 Population

The North East/ Yorkshire and the Humber 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-2017 average population density of 3,648 people per km², compared to an average of 427 in England as a whole¹³. When comparing population and household statistics and projections (Table D5), it is important to note that whilst the population growth rate for the whole of England over the period 2061-2026 was 5.6%, Yorkshire and The Humber and the North East both saw a lower growth rates of 3.5% and 1.9% respectively.

Period	2016	2016	2026	2041	% change	over period
Region	Population	No. Households	Population	No. Households	Population	No. Households
Yorkshire and the Humber	5.4	2.3	5.6	2.6	3.5%	12%
North East of England	2.6	1.15	2.7	1.24	1.9%	8%

 Table D5
 Population¹⁴ and Household¹⁵ statistics and projections (millions)

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

¹³ ONS (2017) Population estimates for the UK, England and Wales, Scotland and Northern Ireland: Mid-2017

¹⁴ ONS (2011) Regional Profiles - Population and Migration (based on mid-2010 population estimates, published on 30 June 2011)

¹⁵ ONS (2018) Household projections in England: 2016-based

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).

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 sites¹⁶. The Index of Multiple Deprivation combines a number of indicators, chosen to cover a range of economic, social and housing issues¹⁷, into a single deprivation score for each Lower Super Output Area¹⁸ 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.

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 4.2 identifies the large number of nature reserves that are present within the SEA study area. Section 4.8 identifies the importance of the study area with respect to heritage assets, including two internationally recognised World Heritage Sites¹⁹ (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 4.9 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)²⁰ states planning policies should protect and enhance public rights of way and access.

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 economy²¹. In 2017, there were >7 million visitors to the top 20 paid attractions in Yorkshire and Humberside, generating over £100 million in spend²².

¹⁶ Defra (2006) Air Quality and Social Deprivation in the UK: an environmental inequalities analysis

¹⁷ Income Deprivation, Employment Deprivation, Health Deprivation and Disability, Education Skills and Training Deprivation, Barriers to Housing and Services, Living Environment Deprivation, and Crime.

¹⁸ 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.

¹⁹ 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

²⁰ Communities and Local Government (2012) National Policy Planning Framework

²¹ Deloitte (2013) The Economic Contribution of the Visitor Economy: UK and the Nations. London

²² Visit England (2017) Yorkshire and the Humber Regional Summary – Research and Highlights https://www.visitbritain.org/sites/default/files/vbcorporate/Documents-Library/documents/England-documents/most_visited_paid_yorkshire_humber_2017.pdf

2.2 Future baseline

Population is expected to grow at a rate between 1.9% and 3.5% across the region (see Table 4.5), with an increasing proportion of people at or above state pension age. Household projections show potential increases of between 8% and 12% across the region, with an increasing proportion of one person households²³.

In response to recent studies access to the recreational resources, green spaces and the historic environment will have greater importance in future planning²⁴. 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 Infrastructure²⁵ 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 region²⁶.

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.
- 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.
- 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.

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.

3 Material Assets and Resource Use

3.1 Baseline

3.1.1 Water Use

In 2017/18, Yorkshire Water abstracted and treated 1,300MI/d (million litres per day) of water for supply to customers, with leakage from the water distribution system for 2017/18 reported as 300 MI/d²⁷.

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 have nearly halved since 2000; household recycling rates have climbed to more than 40%; waste generated by businesses declined by 29% in the six years to 2009 and business recycling rates are above 50%²⁸. 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 D6 shows the latest available data for waste arising by region.

Waste Figures	North East	Yorkshire and The Humber
Commercial and Industrial waste arisings produced in region (million tonnes) (2009) ²⁹	2.4	6.9
Construction & Demolition Environmental Waste (2006)	4.8	10.4
Total waste produced by region (2009)	12.2	30.2

Table D6 Waste Arisings by Region

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.

3.2 Future Baseline

The Government's National Infrastructure Plan³⁰ (2011) includes visions to manage natural capital sustainably; treat water and waste in ways that sustain the environment and enable the economy to prosper; ensure a supply of water that meets the needs of households, businesses and the environment

²⁷ Yorkshire Water Services Limited (2018) Annual Report and Financial Statements.

https://www.yorkshirewater.com/sites/default/files/Yorkshire%20Water%202015%20Annual%20Report%20Publication.pdf and the second state of the seco

²⁸ Defra (2011) Government Review of Waste Policy in England 2011

²⁹ Defra (2011) Government Review of Waste Policy in England 2011

³⁰ HM Treasury Infrastructure UK (2011). National Infrastructure Plan.

now and in the future and deal with waste in accordance with the waste hierarchy moving towards a zero-waste economy. Yorkshire Water's current economic level of leakage target is to reduce its regional level of water leakage from to 297.1MI/d. By 2018/19, the target leakage is reduced by 5MI/d to 292.1MI/d, with a further reduction to 287.1MI/d in 2019/2020. Yorkshire Water's water resources plan for 2014 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.

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.

4 Water

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 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 reference³¹.

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.

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 catchments³²:

- 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.

³¹ Defra (2005) Water Framework Directive: Summary report of the characterisation, impacts and economics analyses required by Article 5, Humber River Basin District

³² Environment Agency (2009) River Basin Management Plan: Humber River Basin District

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 rivers³³. Major rivers within the Yorkshire Water supply area include the Wharfe, Ouse and Derwent.

4.1.2 Surface Waters: Lakes and Reservoirs

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 D3 shows the location of lakes and reservoirs within the SEA study area.

4.1.3 Groundwater

Approximately 25% of Yorkshire Water's supply is from groundwaters, derived from assets within the Grid SWZ or East GWZ. 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 D4 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.

4.1.4 Estuaries

The Humber Basin has over 165 km of coastline and 33,000 km² 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 Basin³⁴. 100% of the estuaries within the Humber Estuary Operational catchment had good chemical water quality in 2015, whilst 33% were of good ecological status³⁵.

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.

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 published

³³ Yorkshire Water Services Limited (2014) Water Resources Management Plan 2010 - 2035

³⁴ Environment Agency (2015) Part 1: Humber river basin district River Basin management plan

³⁵ http://environment.data.gov.uk/catchment-planning/OperationalCatchment/3228/Summary

in 2013³⁶. 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 D7.

Table D7	Catchment Abstraction	Management Strategies	in the Yorkshire	Water Supply Area
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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 Swale 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 D8 and Figure D5 show the resource availability status in SEA study area.

Table D8	Resource Availability	Status 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

³⁶ https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process

Yorkshire Water WRMP2019

CAMS	CAMS Management Unit	Resource availability status		
	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	1. Kelk Beck	Restricted water available for licensing		
Riding	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 &	1. Addingham	Water available		
Lower Ouse	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,	1. Naburn	Restricted water available for licensing		
Niaa & Upper Ouse	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		

CAMS	CAMS Management Unit	Resource availability status		
	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		

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 D9 summarises the key statistics for the catchments within the Yorkshire Water supply area and Figure D3 shows the Overall Classification of River Waterbody Catchments. Similar data are being examined for catchments affected for the Tees Swale transfer option.

				•			
RBD	Relevant RBMP catchment	% at ecologio or po	good cal status tential	% at chemica	good al status	% at status	good overall
		RBMP 2015	Target 2021	RBMP 2015	Target 2021	RBMP 2015	Target 2021
	Idle and Torne	9	9	91	91	9	9
Humber	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

Table D9 Key statistics of WFD Catchment within the Yorkshire Water Supply Area

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 half way through 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 D10 below, which identifies 3% of waterbodies failing as a result of insufficient flow/abstraction.

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%

 Table D10
 Main reasons for waterbodies failing to achieve good ecological status or potential

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 D4 shows the source protection zones in the region.

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. The Environment Agency's Flooding in England report³⁷ highlights that regionally, Yorkshire and Humber has the second highest number of people at risk from flooding – approximately 70,000 properties in the region have a significant risk of flooding. 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.

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

4.2 Future Baseline

The Water Framework Directive sets 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 until 2021 or 2027. The NPPF states that inappropriate

³⁷ Environment Agency (2009) Flooding in England: A National Assessment of Flood Risk

development in areas at risk of flooding (in Flood Zone 1³⁸, Flood Zone 2³⁹, Flood Zone 3a⁴⁰ 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 NPPF41. 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 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 Swale Transfer.

Yorkshire Water's 2014 Water Resource Management Plan⁴² and its 2013 DP 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 throughout the planning period to 2034/35. This reflects the current and forecast economic climate and associated impact on new development and water use. The integration of the Grid SWZ and East GWZ during 2012 will improve supply system resilience and no additional investment is forecast to maintain the water supply/demand balance to 2034/35.

The Environment Agency Water Resource Strategy for the Yorkshire and North East Region⁴³ used future scenarios to look at future pressures on water resources. The scenarios consider a range of responses by Government, regulators, water companies, abstractors and individuals to the way that

³⁸ Low probability of river or sea flooding (<0.1%) which has critical drainage problems

³⁹ Medium probability of river (1%-0.1%) or sea flooding (0.5%-0.1%)

⁴⁰ High probability of river (>1%) or sea flooding (>0.5%)

⁴¹ Communities and Local Government (2012) Technical guidance to the National Policy Planning Framework

⁴² Yorkshire Water (2009), Water Resources Management Plan 2010-2035

⁴³ Environment Agency (2009) Water Resources Strategy – A Regional Action Plan for Yorkshire and North East Region.

water is used and managed. They are not forecasts, but show a range of possible demands in the future. By 2050, climate change could reduce summer river flows by up to 80%. Greater concentrations of rainfall in intense events are likely to result in increased ratios of runoff to recharge, leading to further reductions in recharge rates of groundwater. The Water Resource Strategy for Yorkshire and North East Region shows how the actions within the Water Resources Strategy for England and Wales will be implemented locally. The action plan identified three key priorities (with associated actions) for the Yorkshire and North East Region:

Catchment Management:

- Develop an understanding of upland catchments through investigations with external partners into peat restoration
- Work with water companies to reduce carbon emissions and minimise need to treat water for colour and nitrates through catchment management
- Support Catchment Sensitive Farming Officers in delivering the England Catchment Sensitive Farming Initiative (ECSFI).

Valuing Water:

- Work with agricultural communities and local businesses to promote water efficiency
- Undertake campaigns to raise awareness of sustainable water use, efficiency and reuse
- Work with abstractors when licenses are issues to ensure they understand their permits and provide advice on sustainable water use.

Minimising and adapting to the impacts of climate change:

- Develop a regional water resources model and incorporate the outputs of national science projects to understand the impacts of climate change in the Yorkshire and North East region
- Support hydropower developments across the Yorkshire and North East region.

The UK Climate Change Risk Assessment (CCRA) 2017 Evidence Report⁴⁴ 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.

⁴⁴ Defra (2016) The UK Climate Change Risk Assessment 2017 Evidence Report






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.

5 Soil, Geology and Land-use

5.1 Baseline

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.

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 D6.

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.

5.2 Future Baseline

The vision of Defra's Soils Strategy for England⁴⁵ is for all England's soils to be managed sustainably and degradation threats tackled successfully by 2030. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.

The Water White Paper described the Government's intentions to take forward a catchment-based approach to water quality and diffuse pollution and work towards Common Agricultural Policy reforms that will promote the farming industry's role as custodian of the natural environment⁴⁶. The Water White Paper also identified that the strategic policy statement for Of wat and revised social and environmental guidance would give a strong steer on Government support for approaches that offer good value for customers and the potential to prevent and manage future risks to drinking water quality. These policy objectives were reflected in regulatory guidance from Government for the 2014 water resources management planning process and the 2014 water company price review process.

The catchment-based approach has now been implemented across England, with catchment partnerships now in place across the YWSL region to take forward the approach over the coming years.

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 current agri-environment scheme for landowners is Countryside stewardship. Continued development of this scheme is expected to see an improvement in land use in the future. The UK Countryside Stewardship scheme provides financial incentives for land managers to engage in activities to improve the quality of the management the environment⁴⁷. This includes activities ranging from conservation and restoration of wildlife habitats and flood risk management, to woodland creation and reducing water pollution from agriculture. The scheme allocates funding according to the significance of the designated sites, in three levels; Mid-Tier, Higher Tier and Capital Grants. Applicants choose management options and capital items which provide the environmental priorities for their local area, based on the statements of priorities

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.

⁴⁵ Defra (2009), Safeguarding our soils – A Strategy for England

⁴⁶ Defra (2011) Water for Life - Water White Paper

⁴⁷Gov.UK © (2017). Rural Grants and Payments: Countryside Stewardship. [Online]. Available from: https://www.gov.uk/government/collections/countryside-stewardship-get-paid-for-environmental-land-management [Accessed 3 November 2017].



6 Air and Climate

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 2009 UK Climate Projections (UKCP09) estimate that summers in the Yorkshire and Humber River Basin district are likely to become drier and winters wetter⁴⁸. 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 Report⁴⁹ 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.

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 D7. 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 declared because of emissions from road transport. Reference to AQMAs will be made when considering any adverse on air quality of the WRMP options.

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 2009 UK Climate Projections (UKCP09) estimate that summers in the Yorkshire and Humber River Basin district are likely to become drier and winters wetter⁵⁰. 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 dioxid e (CO₂). National and regional CO₂ emissions estimates and how they are apportioned to their source categories are provided in Table D11.

⁴⁸ UKCP09: http://ukclimateprojections.defra.gov.uk/content/view/1358/499/

⁴⁹ Defra (2016) The UK Climate Change Risk Assessment 2017 Evidence Report

⁵⁰ UKCP09: http://ukclimateprojections.defra.gov.uk/content/view/1358/499/



		/					
Region	Total	Per capita	Percentage Co	ntribution by Sc	ource Sector		
	(million tonnes CO ₂)	(tonnes CO ₂ per capita)	Industry & Commercial	Industry & Domestic			
Yorkshire & The Humber	37.4	6.9	48.6%	23.6%	30%		
North East	15.5	5.9	70.4%	48.1%	26.6%		
UK	378.9	6.5	36.8%	27.7%	33.8%		

Table D11 UK CO₂ emissions (2016)

Source: Department for Business, Energy & Industrial Strategy, BEIS (2018)

There has been an 29% decrease in total emissions between 2005-2016 in the Yorkshire and the Humber region compared with the UK average of 31% decrease⁵¹.

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 D12.

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 manage	ement	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.				

Table D12	Impact of Climate Change on Water Resources
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⁵¹ UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2016, Department for Business, Energy & Industrial Strategy (2018)

Sector	Impact
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.

6.1.3 Adaptation to Climate Change

The UK Climate Change Risk Assessment (CCRA) 2017 Evidence Report⁵² 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.

6.2 Future Baseline

Government and international targets indicate significant cuts in greenhouse gas emissions will take place by 2027. The UK is currently projected to meet its first three legislated carbon budget targets (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 NO2⁵⁴ and PM10⁵⁵ are flattening or even reversing at a number of locations, despite current policy measures. Projections suggest with a high degree of certainty that objectives for PM₁₀, NO₂ and O₃⁵⁶ will not be achieved by 2020⁵⁷.

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 D8.

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.

⁵³ DECC (2015) Updated energy and emissions projections 2015

⁵² Defra (2016) The UK Climate Change Risk Assessment 2017 Evidence Report

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 (2007), The Air Quality Strategy for England, Scotland and Wales

Figure D8 Summary of natural environment impacts with an indication of direction, magnitude and confidence (CCRA, 2012)

	Opportunities			Timing		onfidence
		20	020s	2050s	2080s	ŭ
HE5	Decline in winter mortality due to	higher temperatures				1
BE9	Reduction in energy	demand for heating			·	14
AG1b	Changes in wheat yield (due to	warmer conditions)			,	84 S
MAS	Opening of Arctic shipping r	outes due to ice melt				11-11-11-
BU8	An expansion of tourist d	estinations in the UK			2	
AG9	Opportunitie	s to grow new crops			4	1
MA4b	Changes in fish catch latitude/centre of	f gravity (plaice, sole)				
AG10	Changes in g	rassland productivity				
FO4b	Increase of potential yield of Site	a spruce in Scotland				
	Threats	1	1			
FL6b	Expected Annual Damage (EAD) to residential pro	perty due to flooding				
FL13	Ability to obtain flood insurance for r	esidential properties				
HE10	Effects of floods/stor	ms on mental health				
BU7	Insurance industry expos	ure to UK flood risks				
FL6a	Residential properties at signi	ficant risk of flooding			2	
HE1	Summer mortality due to	higher temperatures				
FO1a	Forest extent affected by re	d band needle blight				
RE3	Ove	erheating of buildings				
EN/2	Eperg	v demand for cooling				
BD9	Changes in speci	es migration patterns				
BDS	Species unable to track cha	nging 'climate space'				1
WA8	Number of unsustainable wate	r abstractions (total)			1	
MAZa	Decline in marine water quality du	to sewer overflows				
MAG	Northward spread of invasio					
RD2	Bicks to species and babitats due	to coastal evolution	1		-	
BD11	Generalist species and habitats due	dant than specialists				
802	Chapter	in soil organic carbon	1			
BUS	Changes -	duo to borrer spinfall			()	
AGII	Bublic votor cur	abe to neavy rainial				-
WAS	Petertial desline in summer water quality (no	int course pollution)			1	
WA9a	Potential decline in summer water quality (po	fine source politicity	-	_		
FLI	Drier solls (due to warmer and drier	summar conditions)				
AG4	brief soils (due to warmer and drief					
AG5	increases in water demand	for irrigation of crops				
8010	Loss of stan hours due to high internal o	unong temperatures			6	
BUB	Mongage provision direatened due to	lite agricultural land			-	-
AG2a	Flood risk to high qua	nity agricultural land			-	
BD1	Risks to species and habit	ats due to drier soils				
WA2	Lower sum	mer river flows (Q95)				
MA4a	Changes in fish catch latitude/centre of g	ravity (cod, haddock)	_			-
WA10	Combined Sewer Ove	rriow spill frequency	_			-
MA9	Decline in productivity of 'cold water' fish	and shellfish stocks				
BD12	Wildfires due to warmer	and drier conditions			i. i	_
FL14a	Agricultural land lost d	ue to coastal erosion			Ť.	
TR6	Scouring of	road and rail bridges			1	
EN10	Energy transmission efficiency capacity losses due	to heat - over ground	Y		p	
TR1	Disruption to road tr	affic due to flooding	and a		1	<u></u>
HE4a	Mortality due to summer	air pollution (ozone)	No d	ata		
BU1	Climate risks	to investment funds	1			
	High consequences (positive)	High confidence				61 11
	Medium consequences (positive)	Medium confider	100	* Note th	at magnitude	of both
	weaturn consequences (positive)	weutum confider	ice	opportun	ities and threa	ats may be
	Low consequences (positive)	Low confidence		depende	nt on specific (conditions,
	Low consequences (negative)			increase	if water availa	hility and
	Medium consequences (negative) High consequences (negative)	Too uncertain to	assess	nutrient :	supplies are no	ot limiting

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.

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.

7 Archaeology and Cultural Heritage

7.1 Baseline

The Yorkshire Water supply area and Tyne-Tees corridor includes three internationally recognised World Heritage Sites⁵⁸: Saltaire; Sudley Royal Park including the ruins of Fountains Abbey; the Frontiers of the Roman Empire (Hadrian's Wall).

There are approximately 2,934 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 D13 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 D9.

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

Asset	England	Yorkshire and Humber	North East	Yorkshire Water Supply Area*	Tees Swale Transfer corridor
World Heritage Site	19	2	2	2	1
Scheduled Monuments	19,858	2,639	1,397	2,934	178
Conservation Areas	9,866	890	296	unknown	unknown
Listed Buildings	378,360	31,554	12,214	30.809	3,301
Registered Parks and Gardens	1,664	124	55	131	11
Registered Historic Battlefields	47	7	6	7	0
Protected Historic Wrecks	46	1	1	1	0

Table D13 Designated Heritage Assets

Source: Historic England: Heritage Indicators 2018 (*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 then⁵⁹. In the Yorkshire and Humber area, 67.8% of buildings or structures on the baseline 1999 Register have been removed due to their futures being secured, this is comparable with the national figure of 64.4%⁶⁰ 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 (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.

⁵⁹ English Heritage, now known as Historic England (2017) Heritage at Risk Registers (Yorkshire; North East; North West; East Midlands).

⁶⁰ Historic England (2018): Heritage at Risk (Yorkshire)



7.2 Future Baseline

The NPPF was introduced in 2012 to replace the Planning Policy Statements. The NPPF aimed to make the planning system less complex and more accessible, and changed the emphasis on planning to have a presumption in favour of development. However, core planning principles 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"⁶¹. 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 change⁶².

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.

8 Landscape and Visual Amenity

8.1 Baseline

The landscape character network⁶³ 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.

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'⁶⁴. 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 D14, there are three AONB within the Yorkshire Water supply area

⁶¹ CLG (2012) National Planning Policy Framework, Communities and Local Government.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

⁶² English Heritage, now known as Historic England, (2010) Climate Change and the Historic Environment

⁶³ www.landscapecharacter.org.uk, accessed 22nd July 2016

⁶⁴ Accessed at www.landscapecharacter.org.uk, accessed 22nd July 2016

(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 from 2009-2014.

Figure D10 shows the landscape designations across the SEA study 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.

Tahla		within the	Vorkshire	Wator	Supply	Aroa
Iable	DI4 AUNDS		IUKSIIIE	vvalei	Supply	AI Ca

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).

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.

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.



Appendix E – Option assessment matrices

Scheme name	C1a-e - Domestic customer audits and retrofit									
Scheme description	This scheme will aim to reduce demand by. The scheme includes five separate phases The scheme involves a trained plumber/tect devices. Recruitment can be achieved by Each phase of the scheme will aim to achie (C1a, C1b, C1c, C1d and C1e), each delive period.	This scheme will aim to reduce demand by offering water efficiency audits and retrofit devices to Yorkshire Water's domestic customers. The savings are based on a visit and fix project we delivered in 2007 to our household customers. The scheme includes five separate phases each to be delivered over five years. The optimisation model can select water efficiency programmes in individual AMPs or continuously over the planning period. This allows flexibility in the delivery and greater potential for water efficiency to be selected. The scheme includes 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. Each phase of the scheme will aim to achieve savings of 1MI/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. Five phases of five years each are included in the scheme (C1a, C1b, C1c, C1d and C1e), each delivering audits and retrofit to 66,000 households to achieve a 1MI/d reduction in demand, for a total resource value of 5MI/d. Each phase will be delivered in a single AMP however, the individual phases allow for up to five phases to be implemented over the 25 year planning period.								
SE	A topics and objectives					Asse	ssment of option			
Торіс	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)	t 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 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 (adverse) Low (beneficial)	Low (adverse) Medium (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 minor beneficial effect on the provision of fresh water as a result of reductions in water demand.	Medium	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	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.	Medium	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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 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 littes per property on average, and the scheme will provide a 1M/ld benefit over five phases of five years each, for a total resource value of 5Ml/d. 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 (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, 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 1MI/d benefit over five phases of five years each, for a total resource value of 5MI/d. This in turn will also help to reduce overall water demand for the region.	Medium	Low	Long-term	Permanent	Medium (beneficial) Low (adverse)	Low (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 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 (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.	I 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.	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.	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 (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 more the sustainable and efficient use of water resources, making the link between water efficiency and environmental protection. The scheme will provide a 1M//d benefit over five phases of five years each, for a total resource value of 5Ml/d.	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	Negligible adverse	Negligible beneficial

SE	A topics and objectives					Asses	ssment of option			
Торіс	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 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 treats of climate change. The scheme will provide a 5Ml/d benefit over five phases of five years each, for a total resource value of 5Ml/d.	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	Negligible adverse	Negligible beneficial
Landscape and visual amenity	 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	Negligible adverse	Negligible beneficial

Scheme name	C2 - Metering (domestic meter optants)									
Scheme description	This scheme proposes to increase the numb To estimate the demand reduction Yorkshire • Prior to changing, domestic meter optants' • Consumption reduces by 5% on opting to n Yorkshire Water has applied these assumpt optants is 256.1 litres/property/day, and the	s scheme proposes to increase the number of of rateable value billed customers switching to a metered supply (domestic meter optants) by an additional 25,000 above those planned for in the baseline forecast. This will be achieved over five years, with a target of 5,000 optants per year. estimate the demand reduction Yorkshire Water could achieve from additional optants, the Ofwat assumptions have been used: rior to changing, domestic meter optants' consumption is 65% of the average unmeasured customers' consumption. onsumption reduces by 5% on opting to meter. withing Water has applied these assumptions to recent estimates of baseline data, i.e. average unmeasured per capita consumption of 149.11 litres/head/day and average unmeasured household consumption of 394 litres/property/day. From the above assumptions, the average household use of meter ants is 256.1 litres/property/day, and the volume of water saved when customers wap to a meter is 12.81 litres/property/day. Therefore, for an additional 25,000 meter optants, the total demand reduction is 0.34Mi/d.								
SEA	topics and objectives					Asses	sment of option			
Торіс	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 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 European 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)	Low (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.	It is likely that there will be a negligible beneficial effect on fresh water provisions as a result of reduced demand. It is estimated consumption reduces by 6% on opting to a meter. The average volume of water saved when customers swap to a meter is 12.81 litres/property/day. Therefore, for an additional 25,000 meter optants, the total demand reduction is 0.32MI/d.	Medium	Low	Long-term	Permanent	Low (beneficial) Low (adverse)	Low (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 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
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 0.32MI/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 (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 affect access to recreation and 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, 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 a 25,000 household properties. The overall asiring is forecast to be 0.32 Mild. 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 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 (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 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 (beneficial) Low (adverse)	Minor (beneficial) Low (adverse)	Negligible adverse	Minor 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.	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 0.32 Ml/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

SEA	topics and objectives		Assessment of option							
Торіс	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	 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	Negligible adverse	Negligible beneficial
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 at 25,000 properties and conduct subsequent meter reading activities.	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 minor, temporary increase in GHG emissions as a result of increased number of vehicle journeys made to survey premises, fit meters at 25,000 properties and conduct subsequent meter reading activities.	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 hence adapting to the threats of climate change. The scheme aims to reduce consumption by 5% and save approximately 12.81 litres/property/day. For an additional 25,000 meter optants, the total demand reduction is 0.32Mi/d.	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	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 have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial

PUBLIC

Scheme name

C4a-e - Metering on change of occupancy

Scheme description	Change of occupancy metering provides and same as for meter optants. This has been ci - Average unmeasured household consumpt - Consumption reduces by 10% on compulso Metering on change of occupancy would deli C4a: AMP7 - 10.73Ml/d C4b: AMP9 - 0.74Ml/d C4c: AMP9 - 2.36Ml/d C4d: AMP10 - 2.36Ml/d C4e: AMP11 - 1.42Ml/d	ther opportunity for household water savings. A policy to install alculated based on the following assumptions: in is 394/prop/day, based on an average unmeasured per cap by metering. This number is greater than the savings assumed ver a total resource value of 24.89MI/d over five phases between the save set of the save set of	meters on change of occ oita consumption of 149.1 I for optants as it is assur on AMP7 and AMP11, as	cupancy over five years (11/h/d. med that optants are alre follows:	would lead to meter insta	illations in 283,889 prope	erties. The volume of wa	ter saved through chang	e of occupancy metering can	not be assumed to be the
SEA	topics and objectives					Asse	ssment of option			
Торіс	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	 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	 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 (24.89Ml/d).	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
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 24.89Ml/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.	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, 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 24.89Ml/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.	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

SEA	topics and objectives					Asses	ssment of option			
Торіс	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 primary aim of the scheme is to encourage sustainable and efficient use of water resources. The overall water saving is expected to be 24.88M/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	Negligible adverse	Negligible beneficial
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
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 minor 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	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 have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial

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Scheme name C5a-d - Smart Metering This option is to deliver a meter replacement programme to remove the existing AMR (automatic meter reading) meters from our 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. Scheme description C5a: AMP8 - 11.31Mi/d C5b: AMP9 - 4.60Mi/d C6b: AMP9 10.4 ZAMi/d

C6C: AMP	10 -	4.7	4IVII/a
C7d: AMP	11 -	11	.04MI/d

SEA	A topics and objectives		Assessment or option							
Торіс	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 European 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 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	 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
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 31.69M/01. 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.	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, 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.	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 by reducing abstraction and discharge to the environment, hence maintaining or increasing the quality of the waterbody.	Medium	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 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.	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 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.	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	Negligible adverse	Negligible beneficial

SEA	A topics and objectives		Assessment of option								
Торіс	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)	t 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 (31.69Ml/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	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 have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial	

C6a-e - Commercial water user audits and retrofit 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 1MI/d, YW will need to visit over 800 commercial properties and install devices in over 600. 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 1MI/d saving over a five year period. Total resource value is 5 MI/d. Assessment of option Scale of effect:

Торіс	Objective	Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)	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)	significance (likely to remain after reasonable mitigation)	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	 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	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	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 will help promote the more efficient use of water by households by offering water efficiency audits and retrofitting of water efficiency devices. Each phase of the scheme will provide a 1MI/d benefit over five years (total 5MI/d). 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, 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.	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 MI/4 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.	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.	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	Negligible adverse	Negligible beneficial

Scheme name

Scheme description

SEA topics and objectives

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SE/	A topics and objectives					Asse	ssment of option			
Торіс	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	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 have no direct effect on landscape and visual amenity	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial

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Scheme name	D1 Active leakage control: find and fix									
Scheme description	The option allows for repair/renewal of supp time is 27 years, commencing in the last two - AMP6: D1a, 5.93Ml/d - AMP7: D1b 19.86 Ml/d, D1c 4.2Ml/d and D - AMP8: D1b 19.86 Ml/d, - AMP9: D1h, 4.35Ml/d. - AMP10: D1i, 4.35Ml/d.	ly pipes to properties to reduce leakage levels. This will include employing o years of AMP6 and continuing to the end of AMP11. By the end of the pi 11d to D1f, 3.65MI/d each phase, total 16.1 MI/d	g more leakage detection and lanning period, the scheme wi	analytical staff. It will er Il provide a total of 35.9	nable Yorkshire Water to 44MI/d additional leakage	o identify and fix more lea e reduction, as follows:	aks each year and withi	n shorter timescales, the	reby reducing the annual lea	akage total. Implementation
SEA	topics and objectives				1	Assessn	nent of option			
Торіс	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 is highly unlikely to affect biodiversity, ecology or habitats as the scale of work is minor and within the curtilage of domestic or commercial properties. There may be minor beneficial long-term indirec effect upon aquatic ecology as a result of the reduced demand for abstraction of water from other sources.	Medium t	High	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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 minor beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage reduction.	Medium	High	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	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 repair of leakage is unlikely to spread INNS between sites. 	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	Excavation work may also give rise to very localised but temporary nuisance from noise, dust and vibration for local residents. All impacts foculd be effectively mitgated on a specific project basis through liaison with stakeholders and the general public. The cost of the works may have a minor impact on water bills. The scheme will help to ensure levels of service are maintained through enabling provision of water (up to 35.94Ml/d) that would have otherwise been lost to leakage.	Medium (adverse) Medium (beneficial)	Moderate (adverse) Moderate (beneficial)	Medium-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.	Dependent on the location of the property there may be local, minor but temporary impacts on public rights of way, roads and other access routes due to works vehicles. It is assumed that public rights of way will be maintained during repair activities and there will be no effects on recreational opportunities. Impacts on the water environment are not anticipated.	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Medium (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, encourage its re-use and eliminate waste sent to landfill.	The scheme will help to reduce the overall water demand for the region (up to 35.94Mi/d). 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 (adverse) Medium (beneficial)	Moderate (adverse) Moderate (beneficial)	Medium-term (adverse) Long-term (beneficial)	Permanent (adverse) Permanent (beneficial)	Low (adverse) High (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Major 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 avoiding abstraction requirements, thus maintaining or increasing the quality of waterbodies.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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.	I The scheme may lead to a reduction in abstraction of water, or reduce the scale of potential abstraction increases across the Yorkshire Water region by up to 35.94Ml/d.	Medium	Moderate	Medium-term	Permanent	Low (adverse) High (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Major 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 negligible impact on flood risk management.	Small	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA	topics and objectives		Assessment of option								
Торіс	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 primary aim of the scheme is to reduce leakage and demand for water. Renewal of their supply pipe may help customers make a link between water efficiency and environmental protection.	Medium	Moderate	Medium-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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.	The renewal of the supply pipe will require minor excavations to the level of the existing pipes. Given the supply pipes are largely within pavements/driveways, and excavation is usually within made ground, there will be minimal impact on soils.	Medium	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.	The scheme will result in temporary, localised, intermittent increases in air emissions and dust arising from additional vehicle movements associated with leak detection and repair projects.	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.	The scheme will result in temporary intermittent increases in GHGs, emissions and dust arising from additional vehicle movements associated with the leak detection and repair projects	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 will help increase resilience to climate change as the overall loss of water from the system will be reduced (up to 35.94Ml/ d), reducing demand on the water supply system	Small	High	Medium-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.	Given the works consist of replacements within disturbed land and are of a minor scale, the excavations associated with the scheme have a very low potential to impact upon known and unknown buried historical assets. This would be further evaluated by desk studies and other investigations prior to construction.	Small	Low	Medium-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 the find and fix activities have the potential for temporary, minor adverse impacts on both designated and undesignated landscapes and townscapes temporarily. Visual amenity will not be affected in the long term as once the pipes are replaced they will be re-buried and the land re-instated.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial	

Scheme name

D4 Customerside

Scheme description	This scheme proposes to achieve water sav Installing acoustic or thermal loggers (at be Acoustic and thermal loggers can be used t acoustic loggers. It is estimated four per cer AMR alarms Yorkshine Water customers on a metered si customers' meters that could be a result of For this scheme the leak alarms will be set scheme. Implementation time is 27 years, commenci - AMP6: D4a 0.16MI/d. - AMP9: D46 0.16MI/d.	kings through identifying and repairing domestic customer supply pipe leaks a op tap) of detect minor changes in sound or temperature which are a result of continu to of the properties fitted with loggers will have plumbing and or supply pipe le upply have AMR (automatic meter reading) meters installed at their properties leaks. By setting AMR (automatic meter reading) alarms to an appropriate vo to identify any flows above 20 litres/property/hour. The process to reset the all ng in the last two years of AMP6 and continuing to the end of AMP11. By the	and plumbing losses. Hous flow through customers' r laks that will be identified and s. This means meter readers of lume we can notify customers arms will require additional m end of the planning period, th	meters. This flow could l repaired following insta can collect the readings of potential leaks and d eter readers to visit the sis will provide a total of	be due to supply pipe or llation of the loggers by driving past the prop offer a repair service. properties over a period 1.37MI/d additional leak	plumbing leaks. This sc erties, without having to of two years. It is estima age reduction, based on	heme proposes to fit lo physically read the met ted two per cent of pro the following phased in	ggers into customer pro er. The AMR meters inc perties will receive supp mplementation:	perties, the majority (90 per lude alarms that can be set ly pipes or plumbing repairs	cent) of which will be to detect continuous flows on as a consequence of this
SE	A topics and objectives					Assessn	nent of option			
Торіс	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	 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area. 	The scheme is highly unlikely to affect biodiversity, ecology or habitats as the scale of work is minor and within the curtilage of domestic or commercial properties. There may be a small, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	High	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 loss through leakage reduction.	Small	High	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 repair of leakage is unlikely to spread INNS between sites.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	Excavation work may also give rise to very localised but temporary nuisance from noise, dust and vibration for local residents. All impacts could be effectively mitigated on a specific project by project basis through liaison with stakeholders and the general public. The cost of the works will have a ninor impact on water bills. The scheme will help to ensure levels of service are maintained through enabling provision of water (1.37Mi/d) that would have otherwise been lost to leakage.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium (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.	Dependent on the location of the property there may be local but temporary impacts on public rights of way, roads and other access routes due to works vehicles. It is assumed that public rights of way will be maintained during repair activities and there will be no effects on recreational opportunity. Impacts on the water environment are not anticipated.	Small s	Moderate	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	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, encourage its re-use and eliminate waste sent to landfill.	The scheme will help to reduce the overall water demand for the region (up to 1.37M/d). Resources for pipework repairs are relatively modest, but the scheme will require some use of materials at a scale consistent with the size of the scheme.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Short-term (adverse) Long-term (beneficial)	Permanent (adverse) Permanent (beneficial)	Medium (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	The scheme may have a small beneficial effect on water quality in the region by avoiding abstraction requirements, thus maintaining or increasing the quality of waterbodies. The overall benefit is likely to be negligible.	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 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 1.37Ml/d.	Small	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.	The small change in demand and discharge of water spread out over Yorkshire will have negligible impact on flood risk management.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA	topics and objectives		Assessment of option									
Торіс	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 primary aim of the scheme is to reduce leakage and demand for water. Pipe repairs will help customers make a link between water efficiency and environmental protection.	Small	Moderate	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.	Pipe repairs will require minor excavations to the level of the existing pipes. Given the supply pipes are largely within pavements/driveways, and excavation is usually within made ground, there will be minimal impact on soils.	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.	The scheme will result in temporary, localised, intermittent increases in air emissions and dust arising from additional vehicle movements associated with the pipe renewal projects.	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.	The scheme will result in temporary intermittent increases in GHGs, emissions and dust arising from additional vehicle movements associated with the pipe repair projects	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 will help increase resilience to climate change as the overall loss of water from the system will be reduced (up to 1.37Ml/d), reducing the water demand on the supply system	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.	Given the works consist of replacements within disturbed land and are of a minor scale, the excavations associated with the scheme have a very low potential to impact upon known and unknown buried historical assets. This would be further evaluated by desk studies and other investigations prior to construction.	Small	Low	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	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 customerside activities have the potential for temporary, negligible adverse impacts on both designated and undesignated landscapes and townscapes temporarily. Visual amenity will not be affected in the long term as once the pipes are replaced they will be re-buried and the land re-instated.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial		

This option involves identifying and repairing leaks on trunk mains (i.e. large capacity pipes transferring water from Yorkshire Water Treatment Works to District Meter Areas). It is assumed that active leakage detection on 20% of trunk mains would lead to savings. The scheme would include installation of an additional meters to ensure adequate water balance data could be collected. Acoustic logging would be used to help detect the leaks. Implementation time is 27 years, commencing in the last two years of AMP6 and continuing to the end of AMP11. By the end of the planning period, the scheme will provide a total of 5.23Ml/d additional leakage reduction, based on the following phased implementation: AMP7: D5b, 2.63Ml/d. AMP81: D5c, 0.62Ml/d. AMP91: D5C, 0.62Ml/d. AMP11: D5F, 0.12Ml/d.

Scheme description

SEA topics and objectives										
Торіс	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 repairs will require excavation to access water pipes. This activity will be temporary and be concentrated in urban/suburban areas where impacts on European 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, and minor beneficial effects may arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply.	Small	Moderate	Long-term	Permanent	Low (dverse) Low (beneficial)	Low (adverse) Medium (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 minor beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage control.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	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 mains repairs is unlikely to spread INNS between sites.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	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 with best practice construction methods applied. The scheme will help to ensure levels of service are maintained through retention of water that would have otherwise been lost to leakage (5.23Mi/d).	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (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.	Mains repair activities have the potential to disrupt some recreational activities 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.	Small	Moderate	Long-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 commercia consumption of resources, minimise the generation of waste, encourage its re- use and eliminate waste sent to landfill.	The scheme will help reduce overall water demand by 5.23Ml/d and improve efficiency of water resource consumption. Resources for mains repairs will require some use of materials at a scale consistent with the size of the pipework to be replaced and excavation material and old pipework may need to be sent to landfill depending on whether it is contaminated and/or can be efficiently recycled.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Short-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 option will help to reduce abstraction of water or at least limit any additional abstraction requirements. The scale of the water savings is likely to result in only negligible beneficial effects for water quality within the zone of influence of Yorkshire Water's sources of supply.	Small	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, and minor beneficial effects may arise for sustainable water resources and reducing the need for development of new water sources.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Water	4.3 To reduce and manage flood risk.	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	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA topics and objectives			Assessment of option									
Торіс	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. The scale of water savings (5.23Ml/d) is assessed as providing a minor beneficial effect.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial		
Soil, geology and land use	 To protect and enhance geology, geomorphology, and the quality and quantity of soils. 	Accessing water pipes in order to repair them will require excavations to the level of the existing pipes – 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	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	The scheme may result in temporary, intermittent and localised increases in air emissions and dust arising from vehicle movements associated with mains repairs.	Small	High	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 scheme may result in temporary intermittent increases in GHC emissions arising from vehicle movements associated with mains repairs.	5 Smail	High	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 will help increase resilience to climate change as the overall loss of water from the system will be reduced (up to 5.23Ml/d), reducing the water demand on the supply system.	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.	The excavations and works associated with mains replacement 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.	I Medium	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.	The excavations and works associated with mains repairs have the potential for temporary, negligible adverse impacts on both designated and undesignated landscapes and townscapes temporarily. Visual amenity will not be affected in the long term as once the pipes are replaced they will be re-buried and the land re- instated.	: Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial		

Scheme name	D6 DMA Engineering & Pressure Management											
	DMA Engineering The option involves DMA optimisation which reduces leakage by operating more efficiently to identify and repair a greater number of leaks. It includes two types of DMA optimisation, DMA engineering and DMA resizing. DMA engineering will reduce leakage by intensively investigating the water balance e.g. recalibrating meters, testing (opening and closing) valves, step testing, installing additional meters/valves. It may also include resizing of DMAs. DMA engineering will target DMAs with higher than average leakage and split the DMA into two or more smaller DMAs. By reducing the size of the DMAs, YW will be able to investigate the water use at a lower level and identify and repair the leaks over a reduced timescale.											
Scheme description	DMA resizing will target DMAs with higher than average leakage and split the DMA into two or more smaller DMAs. By reducing the size of the DMAs, YW will be able to investigate the water use at a lower level and identify and repair the leaks over a reduced timescale. Pressure Management Pressure management is a method of leakage control that we can use to reduce leakage beyond our current target. This scheme proposes to identify and deliver additional pressure management in DMAs (District Meter Areas) identified to have higher than average annual leakage due to high pressure. Yorkshire Water have identified 417 DMAs that would benefit from additional pressure management schemes. The additional pressure management activity will involve: • Replacement of existing modulation units on existing PRVs (pressure reduction valves). • Installation of new PRV and modulation units. There is likely to be additional enabling works, such as service pipe replacement or removing of hydraulic restrictions. The PRVs will need to be replaced every 15 years.											
	Implementation time is 2 / years, commencing in the last two years of AMP6 and continuing to the end of AMP11. By the end of the planning period, this will provide a total of 53.98Ml/d additional leakage reduction, based on the following phased implementation: - AMP7: D6b 27.01Ml/d. - AMP97: D6b 6.9Ml/d. - AMP97: D6b 6.9Ml/d. - AMP10: D6e 6.9Ml/d.											
	SEA topics and objectives Assessment of option											
Торіс	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.	DMA engineering and pressure management activity will be very smal in scale, temporary and concentrated in urban/suburban areas where impacts on European sites or other sites of conservation importance are unlikely. Impacts of the work on local non-designated habitats are also unlikely. Impacts of the work on local non-designated habitats are also unlikely. In the provide the order of the source of the source of the source are unlikely and the source abstraction of water or at least limit any additional abstraction requirements, and minor beneficial effects may arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply.	I Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial		
Biodiversity, flora and fauna	 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 loss through leakage control.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	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.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	There may be some minor and temporary adverse health effects associated with dust, noise and vibration from installation of monitoring equipment on public rights of way and roads. The scheme will help to ensure levels of service are maintained through enabling provision of water (53.98Ml/d) that would have otherwise been lost to leakage.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (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.	The DMA engineering and pressure management works have the potential to disrupt some recreational activities very temporarily on an intermittent basis. Any impacts are expected to be negligible.	Small	High	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, encourage its re-use and eliminate waste sent to landfill.	Resources for leak reparis are relatively modest, but the scheme will require some use of materials at a scale consistent with the size of the scheme. This option will help to reduce abstraction of water or at least limit any additional abstraction requirements (53.98M/d).	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Short-term (adverse) Long-term (beneficial	Temporary (adverse) Permanent (beneficial)) Low (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Minor 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. The scale of the water savings is likely to result in only negligible beneficial effects for water quality within the zone of influence of Yorkshire Water's sources of supply.	Small	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. The scale of water savings (53.98MI/d) is assessed as providing a moderrate beneficial effect.	Small	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.	It is anticipated that the scheme will have negligible impacts upon flood risk.	N/A	N/A	N/A	N/A	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. The scale of water savings is assessed as providing a minor beneficial effect.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial		

SEA topics and objectives		Assessment of option										
Торіс	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 scale of any excavations will be very minor and small-scale and will 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	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.	The scheme may result in temporary, intermittent and localised increases in air emissions and dust arising from vehicle movements associated with DMA engineering and pressure management.	Small	Medium	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.	Vehicle trips necessary for DMA engineering and pressure management will cause emissions of greenhouse gas emissions.	Small	Medium	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 help increase resilience to climate change as the overall loss of water from the system will be reduced (53.98Ml/d), reducing the water demand on the supply system.	Small	Medium	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.	Works required for DMA engineering and pressure management will be very minor and in locations where water pipes have been laid (i.e. already distured land). The risk of impacts on buried or above ground heritage assets are therefore considered negligible.	Small	Medium	Short-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.	Works required for DMA engineering and pressure management will be very minor, predominately in urban and sub-urban settings, temporary and of small-scale. Risk of impacts on landscapes and townscapes are considered negligible.	Small	Medium	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial		
Scheme name	D7 Acoustic logging											
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Scheme description	The option involves acoustic logging on water mains within District Meter Areas (DMAs) which would reduce leakage through more rapid identification of leaks compared to traditional find and fix activity. The scheme aims to install acoustic loggers in DMAs where analysis indicates a higher than average rate of rise. Implementation time is 27 years, commencing in the last two years of AMP6 and continuing to the end of AMP11. By the end of the planning period, the scheme will provide a total of 18.84Ml/d additional leakage reduction, based on the following phased implementation: • AMP6: DTa 2.26Ml/d. • AMP9. TDT 9.422Ml/d. • AMP9. AMP9 & AMP10: DTo-DTe 2.24Ml/d. • AMP71: DTd 0.45Ml/d. SEA topics and objectives											
SE	A topics and objectives					Assess	ment of option					
Торіс	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.	Acoustic logging will require excavation to access water pipes. This activity will be small in scale, temporary and concentrated in urban/suburban areas where impacts on European 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, and minor beneficial effects may to arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply. The reduction in water lost through leakage will result in reduced requirement for abstraction at source and therefore, potential for positive impacts on flow and sensitive habitats/species.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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 minor beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage control.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	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 repair of leakage is unlikely to spread INNS between sites.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	Construction activities associated with installing loggers and repair activities may result in localised nuisance effects associated with traffic and noise. However, these will be short term at any one location (likely to be urban) and assuming best practice construction methods, effects will be minimal. The scheme will help to protect and improve health and well- being and promote sustainable socio-economic development through water yield (18.84MI/d) that would have otherwise been lost to leakage.	Small (adverse) Smali (beneficial)	Moderate (adverse) Moderate (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.	It is assumed that public rights of way will be maintained during repair activities and there will be no effects on recreational opportunity	Small	High	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, encourage its re-use and eliminate waste sent to landfill.	Increased leakage reduction may result in the reduction of water lost in the supply network and therefore the energy and chemicals used to treat it. It utilises existing infrastructure. Repairs may require raw materials. It has been assumed that any materials required would be obtained locally.	Small	Moderate	Long-term	Permanent	Low (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Minor 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. The scale of the water savings is likely to result in only negligible beneficial effects for water quality within the zone of influence of Yorkshire Water's sources of supply. Adverse impacts to water quality in resources such as rivers and groundwater during construction would be negligible.	Small	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.	Small	High	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate beneficial		

SE/	A topics and objectives					Assess	ment of option			
Торіс	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.	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	Short-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.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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 install the loggers will require excavations to the level of the existing pipes – this will be small- scale 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	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.	The scheme may result in temporary and localised intermittent increases in air emissions and dust arising from vehicle movements associated with active leakage control measures.	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.	Vehicle trips necessary for installing loggers, investigations and repairs will cause emissions of greenhouse gas emissions.	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 will help increase resilience to climate change as the overall loss of water from the system will be reduced, reducing the water demand on the supply system. Total savings based on over 500 repairs per a year are 18.84Ml/d.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (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.	Increased leakage reduction activity through acoustic logging approaches will be on pipelines which are already in place, and as such, it is not anticipated that any sites of archaeological or cultural heritage importance will be affected. The setting of any surrounding heritage assets may be impacted for the short term, however, considering the option is an acceleration of ongoing leakage reduction activity, this is considered negligible.	Small	Moderate	Short-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.	The majority of works are anticipated to be in an urban setting. Assuming best practice construction methods, impacts of the construction phase are anticipated to be negligible. The scheme will have no direct effect on landscape and visual amenity in operation.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme description	This option is similar to D7 (acoustic logging mplementation time is 27 years, commencin - AMP6: D8 1.06Ml/d. - AMP7: D8 1.71Ml/d. - AMP9: D8 0.41Ml/d. - AMP9: D8 0.41Ml/d. - AMP10: D8 0.41Ml/d. - AMP11: D8 0.08Ml/d.) but uses satellites to detect leaks in less time than traditional find g in the last two years of AMP6 and continuing to the end of AMP1 in the last two years of AMP6 and continuing to the end of AMP1	and fix activity. 1. By the end of the plan pe	riod, the scheme will pro	wide a total of 4.06MI/d	additional leakage redu	ction, based on the follo	wing phased implementa	ation:	
SEA t	opics and objectives				-	Assess	ment of option	-		
Торіс	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.	Satellite leakage identification will lead to requiring excavation to access water pipes. This activity will be small in scale, temporary and concentrated in urban/suburban areas where impacts on European 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, and minor beneficial effects may arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply. The reduction in water lost through leakage will result in reduced requirement for abstraction at source and therefore, potential for positive impacts on flow and sensitive habitats/species.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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 minor beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage control.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	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 repair of leakage is unlikely to spread INNS between sites.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	Construction activities associated with repair activities may result in localised nuisance effects associated with traffic and noise. However, these will be short term at any one location (likely to be urban) and assuming best practice construction methods, effects will be minimal. The scheme will help to protect and improve health and well- being and promote sustainable socio-economic development through provision of water (4.06MI/d) that would have otherwise been lost to leakage.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Short-term (adverse) Long-term (beneficial)	Permanent (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.	It is assumed that public rights of way will be maintained during repair activities and there will be no effects on recreational opportunity	Small	High	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, 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. It utilises existing infrastructure. Repairs may require raw materials. It has been assumed that any materials required would be obtained locally.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Short-term (adverse) Long-term (beneficial)	Permanent (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 option will help to reduce abstraction of water or at least limit any additional abstraction requirements. The scale of the water savings is likely to result in only negligible beneficial effects for water quality within the zone of influence of Yorkshire Water's sources of supply. Adverse impacts to water resources such as rivers and groundwater during construction would be negligible.	Small	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, and minor beneficial effects may arise for sustainable water resources and reducing the need for development of new water sources.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial

D8 Satellite leakage identification

SEA topics and objectives Assessment of option										
Торіс	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.	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	Short-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.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Soil, geology and land use	6.1 To protect and enhance geology, geomorphology, and the quality and quantity of soils.	Accessing water pipes in order to fix leaks will require excavations to the level of the existing pipes – this will be small- scale 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	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.	The scheme may result in temporary and localised intermittent increases in air emissions and dust arising from vehicle movements associated with active leakage control measures.	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.	Vehicle trips necessary for repairs will cause emissions of greenhouse gas emissions.	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 will help increase resilience to climate change as the overall loss of water from the system will be reduced, reducing the water demand on the supply system. Total savings would be 4.06Ml/d.	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.	Increased leakage reduction activity through satellite leakage identification approaches will be on pipelines which are already in place, and as such, it is not anticipated that any sites of archaeological or cultural heritage importance will be affected. The setting of any surrounding heritage assets may be impacted for the short term, however, considering the option is an acceleration of ongoing leakage reduction activity this is considered negligible.	Small	Medium	Short-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.	The majority of works are anticipated to be in an urban setting. Assuming best practice construction methods, impacts of the construction phase are anticipated to be negligible. The scheme will have no direct effect on landscape and visual amenity in operation.	Small	Medium	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme name	D10 Smart networks											
Scheme description	This option involves reducing leak run time and the volume lost per leak by using analytics to reduce the time it takes to become aware of and detect a leak. This may require additional data logging. Implementation: • AMP6: D10a (2.70Ml/d) • AMP7: D10b (7.79Ml/d) • AMP7: D10b (7.79Ml/d) • AMP7: D10b (0.18Ml/d) • AMP1: D10f (0.18Ml/d)											
SEA t	topics and objectives					Assess	ment of option					
Торіс	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.	Smart network activities will not directly impact biodiversity receptors, and associated activities such as leak repair are assessed by other options. This option will help to reduce abstraction of water or at least limit any additional abstraction requirements, and minor beneficial effects may arise for aquatic habitat within the zone of influence of Yorkshire Water's sources of supply. The reduction in water lost through leakage (up to 13.41Ml/d) will result in reduced requirement for abstraction at source and therefore, potential for positive impacts on flow and sensitive habitats/species.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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 minor beneficial effect on the provision of fresh water as a result of reductions in water loss through leakage control (up to 13.41Ml/d).	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	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 repair of leakage is unlikely to spread INNS between sites.	Small	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	Smart network activities will not directly impact populations, and associated activities such as leak repair are assessed by other options. Impacts are expected to be negligible. The scheme will help to protect and improve health and well- being and promote sustainable socio-economic development through provision of water (up to 13.4.1Mi/d) that would have otherwise been lost to leakage.	Small	Moderate	Long-term	Permanent	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.	Smart network activities will not directly impact populations, and associated activities such as leak repair are assessed by other options. Impacts are expected to be negligible.	Small	High	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, 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 (up to 13.41Ml/d) and therefore the energy and chemicals used to treat it. It utilises existing infrastructure.	Small	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. The scale of the water savings is likely to result in only negligible beneficial effects for water quality within the zone of influence of Yorkshire Water's sources of supply.	Small	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, and minor beneficial effects may arise for sustainable water resources and reducing the need for development of new water sources.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial		

SEA topics and objectives Assessment of option										
Торіс	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.	Smart network activities will not directly impact flood zones, and associated activities such as leak repair are assessed by other options. Impacts are expected to be negligible.	Small	Moderate	Short-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 (of up to 13.41Ml/d) through leakage and helping to promote water efficiency to Yorkshire Water customers.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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.	Smart network activities will not directly impact soils and geology, and associated activities such as leak repair are assessed by other options. Impacts are expected to be negligible.	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.	Smart network activities will not directly impact air quality, and associated activities such as leak repair are assessed by other options. Impacts are expected to be negligible.	Small	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Smart network activities will not directly affect GHG emissions, and associated activities such as leak repair are assessed by other options. Impacts are expected to be negligible.	Small	Moderate	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, reducing the water demand on the supply system. Total savings would reach up to 13.41Ml/d.	Small	Moderate	Short-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.	Smart network activities will not directly affect the historic environment, and associated activities such as leak repair are assessed by other options. Impacts are expected to be negligible.	Small	Medium	Short-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.	Smart network activities will not directly affect landscape values, and associated activities such as leak repair are assessed by other options. Impacts are expected to be negligible.	Small	Medium	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

D11 Service pipe renewal

Scheme description	Yorkshire Water have a small number of District Meter Areas (DMA) where a number of the service pipes have deteriorated to a state that is resulting in frequent leaks. Savings could be made by introducing a replacement scheme for supply pipes in these DMAs. The condition of supply pipes on properties would be investigated and a replacement service offered to the customers if the pipes were found to be in poor condition. Implementation time is 27 years, commencing in the last two years of AMP6 and continuing to the end of AMP11. By the end of the planning period, this will provide a total of 11.18MI/d additional leakage reduction, based on the following phased implementation: • AMP6: D11a 2.00MI/d. • AMP7: D11b 4.78MI/d. • AMP9: D11c 2.05MI/d. • AMP9: D11c 2.05MI/d. • AMP9: D11c 1.21MI/d. • AMP9: D11c 2.05MI/d. • AMP91: D11f 0.42MI/d.											
SEA	topics and objectives					Assessm	ent of option					
Торіс	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 is highly unlikely to affect biodiversity, ecology or habitats as the scale of work is minor and within the curtilage of domestic or commercial properties. There may be a small, but beneficial long-term indirect effect upon aquatic ecology as a result of the reduced demand for water supplies.	Small	High	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 loss through leakage reduction.	Small	High	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 repair of leakage is unlikely to spread INNS between sites.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	Excavation work may also give rise to very localised but temporary nuisance from noise, dust and vibration for local residents. All impacts could be effectively mitigated on a specific project by project basis through liaison with stakeholders and the general public. The cost of the works may have a minor impact on water bills. The scheme will help to ensure levels of service are maintained through enabling provision of water (11.18MI/d) that would have otherwise been lost to leakage.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Medium (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.	Dependent on the location of the property there may be local but temporary impacts on public rights of way, roads and other access routes due to work vehicles. It is assumed that public rights of way will be maintained during repair activities and there will be no effects on recreational opportunity. Impacts on the water environment are not anticipated.	s Small	Moderate	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	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, encourage its re-use and eliminate waste sent to landfill.	The scheme will help to reduce the overall water demand for the region (up to 11.18Ml/d). 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.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Short-term (adverse) Long-term (beneficial)	Permanent (adverse) Permanent (beneficial)	Medium (adverse) Medium (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Moderate 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 avoiding abstraction requirements, thus maintaining or increasing the quality of waterbodies.	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.	I 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 11.18Mi/d.	Small	Moderate	Long-term	Permanent	Low (adverse) Medium (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Moderate 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 negligible impact on flood risk management.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial		
Water	4.4 10 increase awareness of water sustainability and efficient use of water.	I he primary aim of the scheme is to reduce leakage and demand for water. Renewal of their supply pipe will help customers make a link between water efficiency and environmental protection.	r Small	Moderate	Long-term	Permanent	Low (beneficial) Low (adverse)	Medium (beneficial) Low (adverse)	Negligible adverse	Minor beneficial		

SEA	topics and objectives		Assessment of option							
Торіс	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 effec (permanent / temporary)	t 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 renewal of the supply pipe will require minor excavations to the level of the existing pipes. Given the supply pipes are largely within pavements/driveways, and excavation is usually within made ground, there will be minimal impact on soils.	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.	The scheme will result in temporary, localised, intermittent increases in air emissions and dust arising from additional vehicle movements associated with the pipe renewal projects.	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.	The scheme will result in temporary intermittent increases in GHGs, emissions and dust arising from additional vehicle movements associated with the pipe renewal projects	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 will help increase resilience to climate change as the overall loss of water from the system will be reduced (up to 11.18MI/d), reducing the water demand on the supply system	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.	Given the works consist of replacements within disturbed land and are of a minor scale, the excavations associated with the scheme have a very low potential to impact upon known and unknown buried historical assets. This would be further evaluated by desk studies and other investigations prior to construction.	Small	Low	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	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 service pipe renewal activities have the potential for temporary, negligible adverse impacts on both designated and undesignated landscapes and townscapes temporarily. Visual amenity will not be affected in the long term as once the pipes are replaced they will be re-buried and the land re-instated.	Small	High	Short-term	Temporary	Low (beneficial) Low (adverse)	Low (beneficial) Low (adverse)	Negligible adverse	Negligible beneficial

Residual beneficial effect

Negligible beneficial

Negligible beneficial

Negligible beneficial

Minor beneficial

Negligible beneficial

Minor beneficial

(likely to remain after

easonable mitigation)

significance

Residual adverse effect

(likely to remain after

reasonable mitigation)

Negligible adverse

Negligible adverse

Negligible adverse

Minor adverse

Negligible adverse

Negligible adverse

significance

Scheme name	P1 - Reduction in WTW process losses O	ption 1						
	Proposed improvements to treatment proces	sses at the water treatment works to reduce water losses and increase deployable ou	tput.					
Scheme description	The proposed improvements are summarise - Variable speed duty/standby supernatant p - Media retention plates for RGF launders - Washwater recovery tank 500m3	d below: umps 100m3/h						
	The scheme would provide a yield of 0.42MI	/d. Implementation time is two years.						
SEA	A topics and objectives					Assess	sment 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)
3iodiversity, flora and auna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area.	An HRA screening assessment was conducted for this scheme to assess the potential for adverse effects on the South Pennine Moors SAC (UK030280), Peak District Moors (South Pennine Moors Phase 1) SPA (UK907021) and South Pennine Moors Phase 2 SPA (UK9007022). The site is sufficiently distanced for any adverse effects of construction on designated sites to be negligible. The physical improvements to the treatment works to reduce losses are likely to be small-scale within the existing site footprint. There are two SSIs within proximity of the scheme (Dark Peak and Rake Dike). Given the nature of the scheme (improvement works within the water treatment works site), no adverse impacts are likely. However, the site is within IR25 for these SSIS, so consultation with NE will be required during project planning. Green Wood Ancient Woodland is near the WTW (approx. 350m), and the Yateholme Reservoirs & Plantations Local Wildlife Site is immediately adjacent to the WTW. However it is unlikely that the WTW improvement works will have significant effects on these designations, as the works will take place within the existing water infrastructure site. The volume of water saved from this scheme is very small (0.42 MI/d) in relation to the amount of water abstracted from the aquatic environment, so beneficial impacts on aquatic biodiversity are negligible.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)
Biodiversity, flora and auna	 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy. 	The WTW is approximately 500m from the Peak District National Park. Temporary construction impacts (e.g. dust, noise, vehicle movements) on ecosystem services are likely to be negligible. Scheme operation would reduce losses of water during processing, providing a negligible ecosystems and natural capital benefit.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)
iodiversity, flora and iuna	1.3 To avoid introducing or spreading INNS.	Invasive species might be present in the areas that would undergo construction. There is a small risk of introducing/spreading INNS during construction, however 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	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)
Population and human lealth	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 site is within the green belt, in a sparsely populated rural area. Local residents may experience increased HGV movements on local roads during construction phase. However, it is anticipated that impacts or 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 (DO of 0.42Mt/d), ensuring a resilient supply for customers and economic activity. An increase 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)	High (adverse) Moderate (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)
Population and human health	2.2 To protect and enhance the water environment for other users, including	There may be angling activities present at Dingley, Brownhill, Ramsden reservoirs, and River Holme, however the improved efficiency works is not anticipated to have	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)

Small

High

Medium-term

Temporary

Low (adverse)

Low (beneficial)

Low (adverse)

Medium (beneficial)

an impact on the quality of the angling in the area. During operation the scheme will not affect access to open spaces and will have no bearing on recreation.

sustainable/renewable energy. However, it will increase yield and improve overall

The scheme will require some use of materials at a scale consistent with the size of

the scheme (including supernatant pumps, media retention plates for RGF launders

and a wash water recovery tank). Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for the treatment of chemicals and power for pumping.

3.1 To reduce, and make more efficient, the The scheme will not help reduce water demand, nor will it support the use of

efficiency at the WTW.

recreation, tourism and navigation.

domestic, industrial and commercial

and eliminate waste sent to landfill.

consumption of resources, minimise the

generation of waste, encourage its re-use

Material assets and

resource use

SEA	topics and objectives				Assess	ment of option				
Торіс	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	Medium-term construction impacts will be mitigated by best practice methods, and pollution of local water resources (e.g. Dingley, Brownhill, Ramsden Reservoirs, and River Holme) is unlikely. The scheme is unlikely to affect water quality in the long term.	Small	High	Medium-term	Temporary	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 proposed scheme will not involve increased abstraction, and no impacts on surface or groundwater levels or flows are expected. This option will help to reduce abstraction of water by reducing WTW process losses, but the scale of the savings is negligible.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk.	The WTW site is within flood zone 1. The scheme will not result in an increase in impervious areas, and is not expected to adversely affect flood risk during construction or operation.	Small	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 scheme would have minor direct effects on water efficiency (DO of 0.42Ml/d), however it is not likely to increase awareness of water sustainability.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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.	Construction groundworks will be constrained to a small and existing footprint and are anticipated to have a negligible adverse impact on the 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.	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 may give rise to air emissions and dust over the medium term. These will be minimised through construction best practice methods. Operational air emissions from the WTW are not likely to change relative to existing emissions.	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 GHG emissions over the medium term. These will be minimised through construction best practice methods. Capital carbon emissions associated with the scheme are estimated to be 386 tCO2. Operational GHG emissions from the WTW are not likely to change relative to existing emissions.	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 contribute to a secure supply-demand balance through provision of 0.42MI/d yield, improving resilience to the threats of climate change.	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.	There are approximately 18 listed buildings within 1km of the site. However, construction and operational impacts are expected to be negligible due to the small scale of the works. There are no other known historical assets in proximity to the scheme. Operation of the scheme will not influence the hydrological setting of any water- dependent assets, nor will it permanently influence any other aspect of heritage assets.	Small	Moderate	Medium-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.	The WTW is located approximately 500m from the Peak District National Park. The scheme is not expected to have any permanent direct or indirect effect on landscape and visual amenity. Construction work at the water treatment works is unlikely to have any greater than negligible adverse effects on landscape or visual amenity.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme description	sending 2.4 MI/d (17.4% of the works During AMP6 a granular activated ca The proposed solution is to install lan Proposed improvements include: • Variable speed dutylstandby supper • Sample pump piping modifications • Dutylstandby lamella settlement pla • Sand trap - 2m wide, 2m deep and The scheme would provide a yield of	.flow) to sever. room (GAC) filtration stage will be installed to enable increased throughput at the nella settlers to settle the waste flows and return supernatant to the head of the w atant return pumps 1,300 m3/d nt 2,400 m3/d. Including plinth, polymer dosing and kiosk 6 m long. 1.52MI/d. Implementation time is two years.	works when water quality is orks. As the sludge from th	s poor. This additional tre e actiflo plant will include	atment stage is likely to a large amount of micro	result in an increase in p osand, a sand trap is also	rocess losses. o proposed to collect sa	nd before the sludge rea	ches the lamella.	
SEA to	opics and objectives					Assess	ment of option	•		
Торіс	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	 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area. 	The option/scheme is not associated with any European Sites. The Raincliffe and Forge Valley Woods, Betton Farm Quarries and Spiker's Hill Quarry SSSIs lie within 3km of the WTW, however it is not within IRZs for any of these SSSIs. Forage Valley Woods is also a NNR and Ancient Woodland. It is unlikely that the WTW improvement works will have significant effects on these designations, as the works will take place within the existing water infrastructure site.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy. 	The WTW is situated approximately 3km from the North York National Park. Temporary construction impacts (e.g. dust, noise, vehicle movements) on ecosystem services are likely to be negligible as the WTW is sufficiently distanced from any designations. Scheme operation would reduce losses of water during processing, providing a minor ecosystems and natural capital benefit for water provisioning services.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Invasive species might be present in the areas that would undergo construction. There is a small risk of introducing/spreading INNS during construction, however 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	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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 site lies within a sparsely populated rural area, at approximately 1km from the nearest settlement (Seamer). Local residents may experience increased HGV movements on local roads during construction phase. 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 a reduction in wastewater process losses, improved sludge handling and water supply reliability, thus ensuring a resilient supply for customers and economic activity. An increase in available throughput at the works when water quality is poor 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)	High (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 wate environment for other users, including recreation, tourism and navigation.	There may be angling activities present at River Derwent and nearby Scarborough resort, however the improved efficiency works is not anticipated to have an impact on the quality of the angling in the area. During operation the scheme will not affect access to open spaces and will have no bearing on recreation.	Small	High	Permanent	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, 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, it would contribute to a secure supply demand balance through an yield of 1.52M/dt, thus improving overall efficiency of wastewater and sludge treatment at the WTW. The scheme will require some use of materials at a scale consistent with the size of the scheme (variable speed duty/standby supernatant return pumps, sample pump piping modifications, duty/standby lamella settlement plant). Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for the treatment of water (e.g. polymer dosing) and power for pumping.	Small	High	Medium-term	Permanent	Low (adverse) Low (beneficial)	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	Medium-term construction impacts will be mitigated by best practice methods, and pollution of local water resources (e.g. River Derwent) is unlikely. The scheme is unlikely to affect water quality in the long term.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Negligible beneficial

The WTW operates with actifio settlement followed by rapid gravity filters (RGF). The sludge and washwater produced by the treatment process are sent straight to sewer without any recirculation. This results in large losses in relation to the works throughput. At the time of the audit, the works was treating 13.8 MI/d and

Scheme name

P2 - Reduction in WTW process losses Option 2

Scheme name	P3 - Reduction in WTW process losses C	ption 3								
Scheme description	The WTW experiences high process losses in relation to the works flow. The works currently treats 18/1//d and has a design flow of 30/11/d. Process losses are 6% of throughput, on average. The proposed improvements are summarised below: - 2 duty/standby lamella settlement plant operating at 3,500m3/d - Installation actuated valves on the filter inlet - Assess the condition of the RGFs and the media to ensure they are operating at optimum performance. The scheme would provide a yield of 11/1/d. Implementation time is two years. Set topics and objectives									
SE	A topics and objectives					Asses	sment of option			
Торіс	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 effec (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 effe 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.	An HRA screening assessment was conducted for this scheme to assess the potential for adverse effects on the Denby Grange Colliery Ponds SAC (UK030036). The HRA screening concluded that the physical improvements to the water treatment works to reduce process losses were likely to be small-scale within the existing site footprint, with any construction impacts easily mitigated to ensure any effects on the European sites are negligible. No likely significant effects are therefore anticipated. There is one LNR (Alverthorpe and Wrenthorpe Meadows) and one Wildlife Site (Haigh Hall Spring Wood South) within proximity to the scheme (approximatively 2.5km), however given the nature of the scheme (improvement works within the water treatment works site), and the distance from the European site (over 2km), adverse impacts are not anticipated. The volume of water saved from this scheme is very small (1MI/d) in relation to the amount of water abstracted from the aquatic environment, so beneficial impacts on aquatic biodiversity are negligible.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy. 	There are no major environmental designations situated near the WTW. Temporary construction impacts (e.g. dust, noise, vehicle movements) on ecosystem services are likely to be negligible. Scheme operation would reduce losses of water during processing, providing a minor ecosystems and natural capital benefit with respect to water provisioning services.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS	Invasive species might be present in the areas that would undergo construction. There is a small risk of introducing/spreading INNS during construction, however 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	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Population and human health	2.1 To protect and improve health and well- being and promote sustainable socio- economic development through provision o 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 site lies within a sparsely populated rural area, at approximatively 2.8km from the nearest settlement (Ossett). Local residents may experience increased HGV movements on local roads during construction phase. 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 a reduction in wastewater process losses, and increase in yield (1MI/d), thus improving water supply reliability, and ensuring a resilient supply for customers and economic activity. An increase 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)	High (adverse) Moderate (beneficial)	Medium-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial	Low (adverse)) Low (beneficial)	Medium (deverse) 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 may be angling activities present at River Calder, however the improved efficiency works is not anticipated to have an impact on the quality of the angling in the area. During operation the scheme will not affect access to open spaces and will have no bearing on recreation.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Material assets and resource use	13.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, 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, it would contribute to a secure supply-demand balance through an increased yield of 1MI/d, thus improving overall efficiency of wastewater and sludge treatment at the WTW. The scheme will require some use of materials at a scale consistent with the size of the scheme (duty/standby lamella settlement plant). Once operational, minimal material inputs will be required, other than for regular maintenance but a small amount of additional resources will be needed for the treatment of water (e.g. polymer dosing) and power for pumping.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	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 scheme will have a negligible effect on water quality.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA	A topics and objectives					Assess	ment of option			
Торіс	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 proposed scheme will not involve increased abstraction, and no impacts on surface or groundwater levels or flows are expected. This option will help to reduce abstraction of water by reducing WTW process losses, but help scale of the savings is only likely to lead to minor benefits for sustainable water resource management.	s Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Water	4.3 To reduce and manage flood risk.	The WTW site is within flood zone 1. The scheme will not result in an increase in impervious areas, and is not expected to adversely affect flood risk during construction or operation.	Small	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 scheme would have minor direct effects on water efficiency, however it is not likely to increase awareness of water sustainability.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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.	Construction groundworks will be constrained to a small and existing footprint and are anticipated to have a negligible adverse impact on the 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.	Low	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 localised air emissions and dust over the medium term. These will be minimised through construction best practice methods. Operational air emissions from the WTW are not likely to change relative to existing emissions.	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 GHG emissions over the medium term. These will be minimised through construction best practice methods. Capital carbon emissions associated with the scheme are estimated to be 364 tCO2. Operational GHG emissions from the WTW are not likely to change relative to existing emissions.	Medium	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 to a secure supply-demand balance through an increase in yield of 1MI/d, improving resilience to the threats of climate change.	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.	There are approximatively 21 listed buildings within 3km of the site and one historic site (Thornes Park) situated within 4.5km from the site. However, construction and operational impacts are expected to be negligible due to the small scale of the works. Operation of the scheme will not influence the hydrological setting of any water-dependent assets, nor will it permanently influence any other aspect of heritage assets.	Small	Moderate	Medium-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.	The WTW is not located near major ecological or landscape designations. The scheme is not expected to have any permanent direct or indirect effect on landscape and visual amenity. Construction work at the wastewater treatment works is unlikely to have any greater than negligible adverse effects on landscape or visual amenity.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme description	Proposed improvements include: + 1 No. washwater holding tank sludge pump + 2 No. washwater holding tank sinkers - Demolition of existing dirty washwater settl + 4 No. dirty washwater settlement tanks, ea + 4 No. decant arms + 1 No. supernatant sump + 2 No. duty/standby VSD supernatant return + 1 No. supernatant return flowmeter to reco + 4 No. sludge pump, 60 – 75 m3/h (based o New MCC and associated control panels - Rerouting of pipework from dirty washwate The scheme would provide a yield of 2.75MI	ement tanks ch 700 m3 i pumps, 0 – 155 m3/h d flows of 0 to 155 m3/h n existing sludge pump capacity) r holding tanks to new settlement tanks (d. Implementation time is two years.								
SEA	topics and objectives			1	1	Assess	ment of option	1	1	1
Торіс	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.	An HRA screening assessment was conducted for this scheme to assess the potential for adverse effects on the South Pennine Moors SAC (UK000280), Peak District Moors (South Pennine Moors Phase 1), SPA (UK9007021) and South Pennine Moors Phase 2 SPA (UK9007022). The HRA screening concluded that the physical improvements to the water treatment works to reduce process losses were likely to be small-scale within the existing site footprint, with any construction impacts easily mitigated to ansure any effects on the European sites are negligible. No likely significant effects are therefore anticipated. There is a LWS (Shaw Wood, 900m) and two Ancient Woodland Sites (1.7km) within proximity to the scheme, however given the nature of the scheme (improvement works within the water treatment works site), adverse impacts are not anticipated.	Small	High	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.	There are a few small designations situated near the WTW, however, temporary construction impacts (e.g. dust, noise, vehicle movements) on ecosystem services are likely to be negligible. Scheme operation would reduce losses of water during processing, providing a minor ecosystems and natural capital benefit for water provisioning services.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Biodiversity, flora and fauna	 To avoid introducing or spreading INNS. 	Invasive species may be present in the areas that would undergo construction. There is a small risk of introducing/spreading INNS during construction, however 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	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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 site lies within a sparsely populated rural area, at approximatively 1.2km from the nearest settlement (Golcar). Local residents may experience increased HGV movements on local roads during construction phase. 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 a reduction in wastewater process losses, and increase in yield (2.75Ml/d), thus improving water supply reliability, and ensuring a resilient supply for customers and economic activity. An increase 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 (ddverse) Small (beneficial)	High (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.	The efficiency works are not anticipated to have an impact on the water environment for other users, including recreation, tourism and navigation. During operation the scheme will not affect access to open spaces and will have no bearing on 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, 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, it would contribute to a secure supply- demand balance and compliance with Yorkshire Water asset standards through an improvement of overall efficiency of wastewater and sludge treatment processes at the WTW (yield 2.75Mi/d). The scheme waster and sludge treatment processes at the WTW (yield 2.75Mi/d). The scheme will require some use of materials at a scale consistent with the size of the scheme (washwater holding tank sludge pump, washwater holding tank mixers, dirty washwater settlement tanks, decant arms, supernatant sump, duty/standby VSD supernatant return pomps, supernatant return fowmeter, sludge pump, new MCC and associated control panels, rerouting of pipework from dirty washwater holding tanks to new settlement tank. Once operational, minimal material inputs will be required, other than for regular maintenance.	Smail	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial

High process losses are experienced at the WTW as there is no operational wash water recovery system at the site. All wastewater and sludge goes straight to sewer. Throughput of the works is around 20Mi/d and losses 10% (2Mi/d).

Scheme name

P4 Reduction in WTW process losses Option 4

SEA	topics and objectives					Assess	ment of option			
Торіс	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	Impacts on water quality during scheme construction and operation are expected to be negligible.	Small	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.	The proposed scheme will not involve increased abstraction, and no impacts on surface or groundwater levels or flows are expected. This option will help to reduce abstraction of water by reducing WTW process losses, but the scale of the savings is only likely to lead to minor benefits for sustainable water resource management.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Water	4.3 To reduce and manage flood risk.	The WTW site is within flood zone 1. The scheme will not result in an increase in impervious areas, and is not expected to adversely affect flood risk during construction or operation.	Small	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 scheme would have minor direct effects on water efficiency (yield of 1Ml/d), however it is not likely to increase awareness of water sustainability.	Small	High	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (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.	Construction groundworks will be constrained to a small and existing footprint and are anticipated to have a negligible adverse impact on the 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.	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 air emissions and dust over the medium term. These will be minimised through construction best practice methods. Operational air emissions from the WTW are not likely to change relative to existing emissions.	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 GHG emissions over the medium term. These will be minimised through construction best practice methods. Capital carbon emissions associated with the scheme are estimated to be 781 tCO2. Operational GHG emissions from the WTW are not likely to change relative to existing emissions.	Medium	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 to a secure supply-demand balance through an improved wastewater and sludge treatment processes (yield of 1Ml/d), thus increasing resilience to the threats of climate change.	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.	There is a major historic and cultural site (i.e. Cambodunum Roman fort and vicus Slack) and around 500 listed buildings within 3km of the WTW site. Construction and operational impacts are expected to have a negligible impact on these designations. Operation of the scheme will not influence the hydrological setting of any water- dependent assets, however it may temporary affect some aspects of heritage assets.	Small	Moderate	Medium-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.	The WTW is not located near major ecological or landscape designations. The scheme is not expected to have any permanent direct or indirect effect on landscape and visual amenity. Construction work at the wastewater treatment works is unlikely to have any greater than negligible adverse effects on landscape or visual amenity.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Part 1 of 2

Scheme name	R1a: River Ouse water treatment works e	xtension								
Scheme description	This scheme involves the construction of add than the existing works, efficiencies due to in The licence allows for abstraction of 96MI/d a treated water storage canacity	ditional water treatment capacity at a WTW to enable YWSL to abstract water from the River Ouse up to the limit terconnecting the two works is expected to provide an increased maximum output. average and 130M//d peak. This scheme enables an additional 22MI/d yield (average) – with an additional 25MI/d	of the abstraction licence, b d (average) abstracted and	by constructing a mirror in 3MI/d returned as WTW v	nage of the existing 35M washwater. The scheme	11/d works. It is estimated e includes a new intake a	the combined output of t nd raw water pumping st	the two works would be unation would be constructed	p to 80MI/d. Despite the add	itional works being no bigger nent plant, contact tanks and
SE	A topics and objectives					Asses	sment of option			
Торіс	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)	t 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 Strensall Common SAC (UK003024, 7 Skm from the scheme) which is supported by the Syke and the River Foss. The site is not hydrologically linked to the proposed scheme. The designated site is situated in hydrological connectivity with the River Fisss small the Syke, with the confluence of these watercourses and the River Cues site 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 Strensall Common 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 (IR2) for the SAC. Effects on the Humber Estuary SAC (UK0030170), Humber Estuary SPA (UK0006111) and Humber Estuary Ramsar (UK11031) were also considered during IRAs screening. The scheme would operate within existing licence conditions, therefore flow/level effects on the Humber EMS are assumed to have already been considered through the Review of Consents process. There are two LNRs (Clifton Backies and Hob Moor) in proximity to the scheme. Both of these are over 2km from the scheme location and are not dependent of flows in the River Ques: Therefore no adverse impacts are anticipated. 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. The construction phase of the scheme may have a medium-term (~1 year) temporary effect on local biodiversity over a medium (~16m) area. These effects will be mitigated as far as possible by best practice construction methods and undertaken at an appropriate lime of year where necessary to protect habitats and ecology (e.g. avoidance of any piling activity at nigh	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	 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 knotwed, giant hogwed & Himalayan balsam) are known to be present in the areas that would undergo construction. There is a small risk of introducing/specialing 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
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 (DO of 22MI/d), ensuring a resilient supply for customers and economic activity. An increase of 22MI/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	Medium-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 open spaces 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, 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 (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) 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 Cuse. 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.	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
Water	4.3 To reduce and manage flood risk.	The WTW site is within 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 fina 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.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
Soil, geology and land use	b.1 to protect and enhance geology, geomorphology, and the quality and quantity of soils.	Lonstruction 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.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

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SEA	A topics and objectives					Assess	sment of option			
Торіс	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)	t 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 will give rise to emissions and dust over the short tem. These will be minimised through construction best practice methods. Part of the construction work will be within proximity to York City 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 -1.5km north of the an Area of Archaeological importance). Construction of the scheme will involve exeavation which could affect unknown buried assets (although no impacts were recorded during recent extension works at the site in 2011- 12). This would be further evaluated by desk studies and other investigations prior to construction. The site has been used for a water treatment works since 1846. 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)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Landscape and visual amenity	 To protect and enhance designated and undesignated landscapes, townscapes and the countryside. 	There are no designated landscapes associated with the scheme, which is located on the outer edge of York next to the East Coast main railway line. The site has been used as a WTW since 1846. During construction, the scheme will present a minor temporary impact on visual amenity in the locality if viewed from the Clifton lngs meadows on the opposite river bank.	Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

R2: Ouse Raw Water Transfer

Scheme name

Scheme description	This scheme is for a new pipeline (4.8km) connecting to 35Ml/d at the new works. this leaves up to 60Ml/d of The scheme would provide a yield of 60Ml/d.	an abstraction point to an existing pipeline, which then connects to another abstraction to a WTW. The scheme v the 96Ml/d annual average licence available to transfer to the WTW. The scheme proposes to build infrastructu	vill utilise the existing raw wate re to provide 60MI/d maximum	r licence (96MI/d averag supply within the constra	e, 130MI/d peak) on the aints of the existing annu	River Ouse by transferrir al average licence perm	ng it to a WTW, rather th issions.	an treating at source. Th	ne WTW was rebuilt in AMF	75 to abstract and treat up
	SEA topics and objectives					Assessme	nt of option			
Торіс	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.	IRRA screening has been undertaken to assess potential impacts that the scheme might have on the Strensail Common SAC (UK003024), which is supported by The Syke and The River Foss. The IRRA fals considered Humber Estuary SAC (UK030170), Humber Estuary SPA (UK9006111) and Humber Estuary Ramsar (UK 11031). Overall the HRA conducted that I was unlikely that there would be any likely significant effects, however, further assessment is required. Please see the HRA for further details. There are two LNRs (Cillion Backies and Hob Moor) 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 on flows in the River Ouse, therefore no adverse ing 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. Coltino Ings and Raburd and the scheme forther intersects the Ciltion Ings and Raburd SSSI IRZ. Consultation with NE will be required regarding mitigation for potential impacts on this SSSI during project planning (hence moderate adverse effect).	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 (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 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 (adverse) Low (beneficial)	Low (adverse) low (beneficial)	Negligible adverse	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.	Construction works would take place within the boundary of an existing WTW. 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 nuisaene from noise, dust and vibration may be a small risk to recreational activity alongside the river Ouse, the York-Setby 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 A19 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 60MI/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, the York-Selby 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 A18 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 open space and will have no bearing on recreation.	Small	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, 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 (4.8km pipeline). 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	 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 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.	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.	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.	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 groundworks will be constrained to a small footprint are anticipated to have a negligible adverse impact in the soil quality. 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 soi associated with the construction work (pipeline trenching/tunneling of 4.8 km) are considered small scale, temporary and reversible.	Small	Moderate	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) low (beneficial)	Minor adverse	Negligible beneficial

	SEA topics and objectives					Assessmer	nt of option			
Торіс	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 and vehicle movements associated with the construction phase will give rise to emissions and dust over the short term. These will be minimized through construction bets practice methods. Part of the construction work will be within proximity to York AOMA. 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 AOMA. Operation of WTW and pumping station will give rise to air pollutant 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.	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. It is anticipated that the scheme will result in 6,110 ionnes of carbon during construction.	Small	Moderate	Medium-term	Permanent	Medium (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 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) 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 Scheduled Ancient Monuments Poppleton Medieval moated site, fishponds - St Evenida's Church are 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 recent extension works at the site in 2011-12). The 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 devrese impact to any unknown assets. Further studies will determine mitigation requirements closer to project implementation. Operation of the scheme will not influence the hydrological stelling 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	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 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, A19 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 (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

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Scheme name

R3: Increased River Ouse pump storage capacity

	This scheme is to increase the pumping capacity at a pumping station to 150M/d (scheme includes a twin pipeline at the River Wharfe to reduce the risk of the sche	(within licence flow constraints) by installing new pumps and an additional 28.5km pipeline. This scheme assumes the addition me failing.	nal yield under normal operat	ions will be constrained	to 10MI/d (134MI/d total) with the ability to increa	ase to provide the full 15	50MI/d as a temporary m	neasure if required in an e	mergency situation. This
Scheme description	The scheme would provide a yield of 10Ml/d. SEA topics and objectives	•				Assessme	nt of option			
Торіс	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 habita connectivity within Yorkshire Water's supply and source area.	II HRA was conducted to assess the possible impacts that the scheme would have Strensal Common SAC (UK0030244) and (Kik Deighton SAC (UK0030244)). Three 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 Humber Estuary SAC (UK0030170). Humber Estuary SPA (UK00301711) and Humber Estuary Remars (UK113031). Additional abstractions through existing licences have been considered in the EA's Review of Consents, which concluded that three were no LSEs associated with any of the vesiting Vickheim Water abstraction licences. Please see HRA for full details. There are five SSSIs within proximity to the pipeline component of the scheme (Aubert Ings, Linton Common, East Keswick Fitts, Eccup Reservoir Which Scoles to the end point of the properal devices effects from construction activities. This is especially fur to fit Eccup Reservoir WSSI (supports a range of wintering and passage wildhow). The potential construction activities have been assessed as minor risk kinding account of best practice construction methods and careful timing of work to avoid breeding/heeting bened furviewer impacts. However, careful mitigation for potential impact from the pipeline construction activities in impacts on these SSIs during project planning. Uncertainty surrounds the potential most of the nore advices impacts. However, careful mitigation during construction schedule ensures to greater than minor advices impacts. However, careful mediational abstraction should ensure to greater than minor advices impacts. However, careful mediational abstraction whome reflex, Baskinges), and potential like of the spread of invasive species. However, careful mediational abstraction should ensure to greater than minor advices impacts.	Large	Low	Medium-term	Temporary	Low (dverse) 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 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
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 minimia as the pipeline route mainly passes through nural 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 10Muld n deployabe 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 (e.g. the Leeds Way) 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 laison 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, 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/memwable energy. Scheme constraintion will require some use of materials at a scale consistent with the size of the scheme (28 5 km of steel pipeline and 8 infrastructure crossings). The scheme will make use of some existing pipeline infrastructure. Once operational, minimal material imputs will be required, other than for require 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 miligated by best practice methods to prevent polition of any watercourses. The scheme is unikely to affect water quality in the long term. The increased abstraction will only be permitted under the abstraction litence conditions at flows greater than 650 Mi/d, leading to negligible adverse effects on diution 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 will be within existing abstraction licence limits. The impact of the additional abstraction is assessed as being negligible and can only occur at flows greater than 650 MId.	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.	During construction, some of the pipeline sections will be located within or in proximity to Flood flaki 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 A essential). 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 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 new pipeline and improvements to the esisting pipeline will involve construction groundworks and potentially impact upon areas of greenbell and. Crade 2 and 3 agricultural 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

	SEA topics and objectives					Assessme	nt of option			
Торіс	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 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
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 the WTW, with a negligible adverse impact on greenhouse gas emissions. It is anticipated that construction will result in emission of 929 tonnes of carbon.	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 (10MMd) 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 100m of the pipeline (Smithy at Herd Farm, Herd Farmhouse, Barn at Herd Farm, Skewirk Hall, These are optomilarly at risk of suffering from adverse impacts form construction and may require modification of the route in dialogue with the property owners and English Herlage to avoid short-farm and long-term effects. There are also two Scheduled Ancient Mourments within its more the proposed pipeline route and pumping station (Datton Parlours Roman Vila and Iron Age Settlement and Moated Site 50m North West of Red House). Harewood House Registered Park and Garden is located towards the end of the pipeline (rad crosses over the proposed route), whilst Berringborough Hal is within 1km proximity to the Pumping Station. Finally, a section of the proposed pipeline route as adjacent to a historic battlefield (Ratte of Marson Moor 1644). The construction of the scheme will involve excavation which could affect unknown burled assets. A watching brief, surveys and investigation may be implemented during construction if required to reduce the risk of adverse impact to any unknown herfage 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	R5 Aquifer Storage and Recovery Schem	e1								
Scheme description	This scheme involves the storage of potable This scheme is to expand the existing ASR the The proposed expansion would involve drilli Phase 1 will include drilling and testing the r will need to be flushed several times to ensi. Phase 2 would involve finalising the headword The yield quoted is the instantaneous yield, The resource value for this option is 10Ml/d.	water in an aquifer near a WTW. An aquifer storage and recovery (ASR) system is already in place, to increase the volume of water that can be injected and re-abstracted from the aquifer, which is contron a additional boreholes to increase the injection capacity from 5Mi/d to 25Mi/d. The initial assumption we boreholes, procuring land and investigating the hydrogeology/operational implications of expandir and investigating flow is removed. rise of the additional boreholes, installing chlorination units and pumps at each site and installing the c which if abstracted six months of the year is an annual yield of 25Mi/d for 183 days, giving 4,575Mi/ye	consisting of a single boreho olled by the number and pum is that we would inject water g the current ASR. It is estim connecting pipe work to transf ar or a maximum average of	le which provides storag ping rate of the boreholes into the aquifer six mon ated three to seven addi er the yield to the WTW. 10MI/d each year. As it	e for up to 5MI/d. s. The aquifer has no cor ths of the year, providing tional boreholes will be r will not be possible to re-	nnecting flow therefore is storage for up to 25MI/d equired to inject 25 MI/d. -abstract all the water inje	suitable for injecting wa to be abstracted over si The capital costs for th acted, it is assumed the	ter to be abstracted whe ix months. is scheme assume an ac scheme will provide 10 f	n needed. Iditional four boreholes wil /II/d (80 per cent) on avera	l be drilled. The aquifer ge.
SEA	topics and objectives					Assessmer	t of option			
Торіс	Objective	Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)	Scale of effect: geography and/or population affected (smal / 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 of the Humber Estuary SAC (UK0030170). Humber Estuary SPA (UK900111), Humber Estuary Ramsar (UK11031), Lower Dervent Valley SAC, UK0012844), Lower Dervent Valley SPA (UK9006802), Lower Dervent Valley Ramsar (UK11037), River Dervent SAC (UK003273), Skipworth Common SAC (UK0030276), Thorne Moor SAC (UK0012915) and Thorne and Hatfield Moors SPA (UK9005171). The HRA found that as the scheme involves abstraction within the current abstraction licence limits, no likely significant effects on these European sites are expected. This is consistent with the findings of the Review of Consents process for this abstraction licence. There are four SSIs within proximity of the scheme (River Dervent, Humber Estuary and Barn Hill Meadows, Breighton Meadows) and one LNR (Howden Marsh). These sites are all water sensitive. However, with abstraction only taking place at moderate to high flows and within existing abstraction [cence limits, impacts will be no greater than moderate adverse. The rate of abstraction (maximum 25 Mi/d) will no limpact on the egisotic flood flows that are important to the hydrological requirements for Barn Hill Meadows SSIs and Howden Marsh LNR. The scheme involves abstraction of 25 Mild at moderate to high flows and the abstraction of nor- designated habitats and species. Even if abstraction toky place at lower flows, the abstraction of impacts on these SSIs will be required during project planning. Dependent on more detailed design for this scheme, there may be temporary construction impacts on the saft ras possibly by careful design and hosein 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 t	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 Howden Marsh LWS, River Derwent SSSI, Barn Hill Meadows SSSI, 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 Aire 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
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 (141km2). The construction work also has the potential to affect some local transport links, such as the A63, 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 10M/cl in deployable output will help to maintain the supply-demand balance support human health and well-being.	Small (adverse) t 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 drilling of the boreholes may result in temporary disruption to some recreational facilities such as public paths and rights of way in the medium-term. However, construction and operation of the scheme is unlikely to affect access to 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, 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

SEA	topics and objectives					Assessmen	t of option			
Торіс	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	Drilling of the BHs 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 in the River Derwent or the River Ouse given that abstraction will occur at moderate to high flows. Ieading to negligible adverse effects on dilution capacity for any downstream effluent discharges. 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
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.	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 due to the boreholes, therefore the permanent effects on flood storage are assessed as negligible (subject to the findings of any Flood Risk Assessment). 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 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 borehole 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 dimate	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	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 (Barnhill Hall, Crade II). Dependent on the final location of the five boreholes 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 avoid Barnhill Hall scheme design and will consult with the property owner and English Heritage if required. Construction works sub the property owner and English Heritage if required. Construction work 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 Humberhead Levels 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. 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 public rights of way that the scheme will intersect and population centres that it is in proximity to the public rights of way that 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 description	Development of practical options to optimis: This option plans to optimise the group licer maximum output capacity is 65Ml/d; wherea implementation of the scheme would involv • A pumping station, to boost flows (12Ml/d) • Land purchase to accommodate the pump • A revised connection arrangement. • Modifications to the network to alleviate ur The scheme would provide a yield of 12Ml/d	e the use of a groundwater group abstraction licence by improving connectivity with the Yr nees by improving connectivity with the grid, so that the currently underutilised licence qua is actual average output is generally below this (under 50Ml/d). Based on the information is the following: through the existing 450mm mains (~9km), including a connection from the pumping stat jing station. Idesirable high and low pressures created by the proposal. I. Implementation time is 3 years.	orkshire Water Grid system. T ntity (estimated to be betwee available, a solution would be ion into the mains. The existir	This will enable the use o n 12 and 20MI/d), can be to install booster pumps ng 450mm diameter cast	of underutilised licensed e exported to the grid sy s to pump back to the gr t iron pipeline was instal	boreholes more widely, stem. The scheme would id connection. A conser led in 1972 and is in good	d utilise spare capacity a vative yield benefit estin d condition.	at a WTW, which alread nate of 12MI/d has beer	y treats water to support the assumed.	grid. The treatment works
SE	A topics and objectives					Assess	ment of option			
Торіс	Objective	Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)	Scale of effect: geography and/or population affected (smal / medium / large)	Certainty of effect Il (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 effec significance (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area. 	No European sites have been identified by the HRA that would be affected by this groundwater scheme. 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 r	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
Population and human health	2.1 To protect and improve health and well- being and promote sustainable socio- economic development through provision o 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 f measures. An increase of 12 Mi/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, 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 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 the Idle Aire & Don Magnesian Limestone WFD groundwater body (GB440410370900) 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.	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 an groundwater levels and flows, and ensure sustainable management of abstractions.	Abstraction would be within existing abstraction licence conditions. The WFD Aire & Doi Magnesian Limestone groundwater body is classified as being in a good water balance status. 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 (GB104027057541).	n Medium	Moderate	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk.	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 abov 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). The additional abstraction will have a negligible effect on flood flows.	e Medium	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

R6 South Yorkshire Groundwater Option 1

SEA	topics and objectives					Assessi	ment of option			
Торіс	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 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	 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 0.1 ha 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	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Air and climate	6.2 To minimise greenhouse gas emissions.	Similar as above, 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 valer 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 (12MI/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 Bett. 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	e R9 North Yorkshire Groundwater Option										
Scheme description	This option involves increasing the permitted abstraction volume for the existing licence - an increase on the annual average permitted abstraction from 8MI/d to 10MI/d and maximum daily abstraction from 12.5MI/d to 14.5MI/d, providing resilience during high demands. The option would provide a yield of 2MI/d.										
SEA 1	topics and objectives		1			Asses	sment of option				
Торіс	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.	Stage 1 HRA screening has indicated that likely significant effects on the North Pennine Dales Meadows SAC could not be ruled out as a result of the implementation of the North Yorkshire Groundwater Option scheme. HRA Guidance indicates that the Plan making authority (in this case Yorkshire Water) shall adopt, or otherwise give effect to the Plan, only after having ascertained that it will not adversely affect the integrity of a European site. As such, a Stage 2 HRA was required to determine whether the implementation of the North Yorkshire Groundwater Option could impact on the conservation objectives or the qualifying features of the North Pennine Dales Meadows SAC. Analysis of geological and borehole data indicate that the SACs are above the groundwater water table level and that the SACs are designated for non-water dependant features. As such, it is concluded that abstraction from the proposed North Yorkshire Groundwater Option will not have a significant adverse effect on the qualifying features of the North Pennine Dales Meadows SAC.	Low	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (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.	No construction is required for the scheme (existing infrastructure is adequate for the increase in abstraction), and adverse impacts are likely to be minimal during operation or natural capital.	Low	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.	No construction is required, so no risk of introducing INNS through construction activities. As the scheme involves an increase to a current licence, there is no risk of introducing INNS during the operation stage.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible Adverse	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.	An increase of 2 MI/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.	Low	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 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, 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. 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 utilise existing infrastructure.	Low	moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	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	There may be a negligible adverse impact on river water quality at low flows due to the potential impact of a minor reduction in baseflow from the Millstone Grit and Carboniferous Limestone aquifer as a result of the increased abstraction.	Low	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.	There may be a local, negligible impact on baseflow to the River Swale from the Millstone Grit and Carboniferous Limestone aquifer as a result of the increased abstraction. This would require further investigation.	Low	Low	long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible Adverse	Negligible beneficial	
Water	4.3 To reduce and manage flood risk.	No new assets will be constructed in the flood plain and the abstraction would have a negligible impact on flood flows.	Low	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 affect 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.	There is no additional land take or excavations associated with the scheme, therefore no impacts are anticipated.	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.	There is no construction associated with the scheme. It is not anticipated that there will be any impacts on air pollutant emissions during the operation of the scheme.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible Adverse	Negligible beneficial	

SEA	topics and objectives					Asses	sment of option			
Торіс	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.	Operation of the scheme will require a very small amount of additional energy consumption associated with increased groundwater pumping and additional water treatment chemical use, with a negligible adverse impact on greenhouse gas emissions.	Low	Moderate	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 (2Ml/d) contribution to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Low	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 or designated assets within proximity to the scheme. The local area is crossed by the route of a Roman Road but as there is no construction required for this scheme, there is no risk of disturbing unknown buried assets. There are no known water dependent heritage assets that might be affected by the potential small reduction in baseflow due to the abstraction.	n/a	n/a	n/a	n/a	n/a	n/a	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 designated landscapes associated with the scheme. Operation of the scheme is assessed as having no greater than a negligible impact on landscape and visual amenity arising from the potential small reduction in baseflow due to the abstraction.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible Adverse	Negligible beneficial

The scheme would provide a yield of 8MI/d. Implementation time is four years		
The contente field provide d yield of officer. Inplementation time to four years.		

SEA	topics and objectives					Assessment	t of option			
Торіс	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	 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 of Skipworth Common SAC (UK0030276), River Derwent SAC (UK 0030253), Lower Derwent Valley SAC (UK0012844), Lower Derwent Valley SPA (UK006092), Lower Derwent Valley Ramsar (UK11037), Thorne Moor SAC (UK0012915) and Thorne and Hatfield Moors SPA (UK9005171), Humber Estuary SAC (UK0012915) and Thorne and Hatfield Moors SPA (UK9005171), Humber Estuary SAC (UK0012915) and Thorne and Hatfield Moors SPA (UK9005171), Humber Estuary SAC (UK0012915), and Thorne and Hatfield Moors SPA (UK9005171), Humber Estuary SAC (UK0012915), and Thorne and Hatfield Moors SPA (UK9005171), Humber Estuary SAC (UK0012915), and Thorne and Hatfield Moors SPA (UK9005171), Bornes Moors SAC (UK0012915), and Thorne and Hatfield Moors SPA (UK9005171), Bornes Moors SAC (UK0012915), and Thorne and Hatfield Moors SPA (UK9005171), Bornes Moors SAC (UK0012915), and Thorne and Hatfield Moors SPA (UK9005171), Bornes Moors SAC (UK0012915), and Thorne and Hatfield Moors SAC Review of Consents process. The pumping station scheme is near the Eskamhorn Meadows SSSI IRZ. Consultation with Ne 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 habitat arising from the construction of the new pumping station but these should be mitigated by best practice construction 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
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 and pipeline may have a temporary, minor, short term (6 months) adverse impact upon residents located near two residential areas (population density 138/km2), particularly residents in close proximity to the construction site, due to nuisance from noise, dust and vibration. An increase of 8 Mild 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, 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 and pipeline). However the scheme will make good use of a large part of existing infrastructure (the existing water main and pumping station). 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 the Wharfe and Lower Ouse Sherwood Sandstone WFD groundwater body (GB4U401G702400), 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 assessed status (construction and operation) is uncertain - with potential for deterioration between classes. 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	A topics and objectives					Assessmer	nt of option			
Торіс	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 the e Wharfe and Lower Ouse Sherwood Sandstone WFD groundwater body (GB40401G702400), which is classified as good status for water balance, impact on rivers and impact on wellands. Quantifative quality is also good. 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. There is potential for flow reduction in River Ouse from River Wharfe to Upper Humber (GB104027064270), and potential risk of deterioration between classes for water balance.	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.	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. 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 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 and pipeline 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 0.1 ha 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 hertage 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

R13 East Yorkshire Groundwater Option 2

Scheme name

Scheme description	Construction of a new borehole abstract from The scheme will require drilling a borehole ch Abstraction volumes of 6MI/d average (9MI/d	the underlying Sherwood Sandstone with a short piped connection to the nearby covered reservoirs. namber and borehole construction, pump installation, a short pipeline connection to the adjacent treatment works a maximum).	nd the associated mechanic	al and electrical equipme	ent. A contact tank would	also be required.				
SEA	topics and objectives					Assess	ment of option			
Торіс	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	 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 the Skipwith Common SAC (UK0030276), Holl (UK0030276), Holl (VK0030253), Holl to measurable reductions. The stel is sufficiently distanced from proposed infrastructure for direct and in-direct impacts to be unlikely to a list of the proposed infrastructure for direct and in-direct impacts to be unlikely to a list of the lower Dervent Valley SAC (UK0012844), the Lower Dervent Valley Ramar (UK11037). Abstraction would be within the existing licence limit. The small scale of the abstraction would be unlikely to affect flows in the River Dervent Valley SAC (UK0012844), the Lower Dervent Valley SAC (UK0012844), the Lower Dervent Valley SAC (UK0012844), the Lower Dervent Valley Ramar (UK11037). Abstraction would be within the existing licence limit. The small scale of the abstraction would be unlikely to affect flows in the River Dervent. 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 aneighbouring woodland would be mitigated through best practice construction and timing the construction to avoid diverse impacts on bird populations. The exact note of the size work connecting the new borehole to the water treatment works and reservoir is unknown and there is a risk of adverse impact to no the ancient woodland. Conce diverse impacts on the ancient woodland. Once deparation 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 deparation is relatively small in comparison to over	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)	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 implement to avoid this. Invasive species on site will be bientified 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
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 borehole and pipeline may have a temporary, minor, adverse impact upon residents located near two residential areas (population density 138/km2), particularly residents in close proximity to the construction site, due to nuisance from noise, dust and vibration. An increase of 6 Mild 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.	s 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 ornihology 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 access through a Woodland and to facilities including a Community Centre. 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, 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 sustainabilernerwable energy. 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 should be mitigated by best practice methods. Once operational, the abstraction is from the Wharfe and Lower Ouse 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 impact on dependent surface water body status (previously assessed as good) is also uncertain. WFD also considered Selby Dam from Conf. Fox Dike and Care Tible to Ouse (two) - The scheme has been assessed as having an uncertain impact on fish (currently moderate), macro-invertebrates (currently good), macrophytes and Phytobenthos (not previously assessed). Chemical status is likely to remain 'good'.	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 the Wharfe and Lower Ouse and Sherwood Sandstone WFD groundwater body (GB40401G702400), 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 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.	Medium	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

SEA	topics and objectives					Assess	ment of option			
Торіс	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.	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 borehole on flood storage are assessed as negligible. The additional abstraction will have a negligible effect on flood flows.	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 will not increase water efficiency 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.	Construction of the new borehole 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 of the borehole, 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 AOMAs 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 1.269/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/I/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	R16 Reuse abandoned third party GW so	urce option 1								
Scheme description	There is potential for Yorkshire Water to app This first option, R16, requires acquisition of inspection, it is assumed that the borehole w The scheme has been costed to include relit Initial asset inspection, down-hole CCTV s • Based on results of the asset inspection, re	iy for abstraction licences where third parties have recently revoked licences. These sites are seen a borehole on the Marsh, which abstracts from the aquifer and is located approximately 1.2km from ill require full rehabilitation and new borehole infrastructure. Ining the existing borehole; installing new pumping equipment and headworks; and installing new pip new/ geophysical survey; pumping test and water quality tests to ascertain the condition and perfor habilitate the borehole as required.	as good potential locations a WTW. Yorkshire Water ework between the borehol mance of the borehole.	because until recently a have assumed the licen: e and the WTW. It is as	abstractions have been p sed quantity previously h ssumed that the following	permitted and the borehol held by the existing owne g will be required to re-co	le assets, if still in place r would be available fro mmission the asset:	, could be used for publi m the Marsh borehole, v	ic water supply. which is 1.26MI/d. In the abse	ence of a detailed asset
	 Install new borehole infrastructure (submer Construct a new pipeline between the bore The scheme will use the existing processes The scheme would provide a yield of 1.26MI 	sible pumps, rising main, headworks, sample taps, flow meters, M&E, telemetry etc.) at the boreholi hole and the WTW (approximately 1.6km of 250mm PE pipework). and infrastructure at the WTW for water treatment and distribution. /d	e.							
SEA	topics and objectives					Assess	ment of option			
Торіс	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 possible effects of the scheme upon the European designated site of the River Derwent SAC (UK003253), Lower Derwent Valley SAC (UK013244), Lower Derwent Valley SPA (UK900692), Lower Derwent Valley SAC (UK0137), Skipworth Common SAC (UK0030276), Thorne Moor SAC (UK00130170), Humber Estuary SPA (UK9006111) and Humber Estuary Ramsar (UK11031). The HRA found that although the borehole may in some cases be hydrologically connected to the European designated sites, there would be no significant effect due to the groundwater abstraction representing at most <1% of the Q95 flow in the River Derwent at Buttercambe. Pipeline construction would be immediately adjacent to the River Derwent at Buttercambe. Pipeline construction would be immediately adjacent to the River Derwent at Buttercambe. Pipeline construction would be immediately adjacent to the River Derwent SAC. Construction activities would be in accordance with best practice construction methods which would ensure no adverse impacts on the majority of these European sits (or the Humber Estuary or River Derwent SSSI). However, Appropriate Assessment may be required to determine the effectiveness of mitigation measures to minimise construction impacts on the River Butter enablitiation requirement of the various scheme assets, including pipeline, borehole rehabilitation and associated infrastructure development, may cause short term, temporary (< 6 months) effects on non-designated habitas over a small area (<1 ha). These effects will be mitigated as far as possible and undertaken at an appropriate lime of year to minimise possible disasylicin to fora and fauna. Once operational, the scale of the abstraction is small compared to the total abstraction is assessed 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	Short-term	Temporary	Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	 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.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	 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	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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 small-scale, temporary, short-term nuisance from noise, dust and vibration along the pipeline route over the short term (<3 months). These will be mitigated as far as possible through best practice construction methods. An increase of 1.26MI/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)	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 scheme will not improve access to water-related recreation and environment in the local area. During operation the scheme will not affect access to open spaces and will have no bearing on recreation.	. n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
material assets and resource use	1.1 10 reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, 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 sustainabile/newable energy. The scheme will use existing infrastructure where possible at the WTW. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (including 1.8km of pipeline and associated head works). Once operational minimal material inputs will be required, other than for regular maintenance but some very 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	Refurbishment of the borehole may pose a small risk to the quality of groundwater sources through the introduction of contaminants from components and construction equipment. These and the pollution risks to the River Derwent / River Ouse from the short pipeline construction should be mitigated by best practice methods such that any residual effects are negligible. The scheme operation is unlikely to affect water quality in the River Derwent or the River Ouse given the small groundwater abstraction volume involved. The abstraction is from the Wharfe and Lower Ouse WPG proundwater body which is classified as having poor chemical and quantitative status overall - Chemical status has been assessed as staying the same, whereas quantitative status overall - Chemical status has been assessed as staying the same, whereas quantitative unknown risk of saline intrusion. WFD assessment of effects on River Derwent reveal no deterioration between classes or compromises to water body objectives.	Smail	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA	topics and objectives					Assess	sment of option			
Торіс	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.	Abstraction will take place within existing licence conditions. The scale of the abstraction is small compared to the total abstraction from the aquifer unit, but the abstraction is from the Wharfe and Lower Ouse WFD groundwater body which is classified as good status for surface waters and good status for water balance. Any impacts are expected to be negligible.	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.	During construction, some of the pipeline 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 with no above ground land-take, therefore the permanent effects on flood storage are assessed as negligible (subject to the findings of any Flood Risk Assessment). The additional abstraction will have a negligible effect on flood flows.	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	 To protect and enhance geology, geomorphology, and the quality and quantity of soils. 	The construction of the pipeline will involve temporary landtake and disruption to soils along the pipeline route (which includes Grade 1 Agricultural land) over a small area and in the short term (0.32 ha, 1-3 months). No long-term effects from scheme operation are likely on soils, geology or land-use.	Small	Moderate	Short-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 minor air and dust emissions and dust over the short term, but these will be minimised through construction best practices. The scheme is not within proximity to any AQMAs. Operation of the scheme will require some very minor additional annual energy consumption associated with increased river and groundwater pumping and minor additional water treatment chemical use at the WTW, with a negligible adverse impact on air emissions.	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 minor GHG emissions over the short term, but these will be minimised through construction best practices. Operation of the scheme will require some very minor additional annual energy consumption associated with increased river and groundwater pumping and minor additional water treatment chemical use at the VNTW, with a negligible adverse impact on greenhouse gas emissions. It is anticipated that the construction will result in emission of 206 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 minor beneficial contribution (1.26MI/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	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 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. Operation of the scheme is unlikely to have an adverse effect on any heritage asset or setting.	Small	Low	Short-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 are no designated landscapes that will be impacted by the scheme. During construction, the scheme will present small-scale, temporary effects on visual amenity in the local (non-designated) area. These effects may be most apparent in proximity to the public rights of way that the pipeline will intersect and locations in proximity to residential property. The scheme is unlikely to have an effect on landscape and visual amenity during operation as the pipeline will be buried.	s Small	Low	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Part 1 of 2

· Based on results of the asset inspection, rehabilitate the borehole as required. Scheme description

Scheme name

R17 Reuse abandoned third party GW source option 2

• Install new borehole infrastructure (submersible pumps, rising main, headworks, sample taps, flow meters, M&E, telemetry etc.) at the borehole.

Construct a new pipeline between the boreholes and the WTW (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							
Торіс	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	 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 of the South Pennine Moors SAC (UK0030280) and South Pennine Moors Phase 2 SPA (UK907022). The boreholes are located approximately 9.5 km from the SAC and SPA and 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 RoC undertaken by the EA. The HRA concluded that there will be no likely significant effects on any of these sites. Pipeline construction would be within proximity to the Leed-Liverpool Canal SSSI, but it is sufficiently distanced from the canal not to have any adverse impacts. However, the scheme is within the IRZ for this SSSI, so consultation with NE will be required regarding mitigation during project planning. Meanwood Valley LNR is within 1km of the borehole but is not affected by the pipeline route. Bringing the boreholes back into use may have a minor adverse impact on the flow in the Meanwood Valley LNR is wo ancient wooldands (Swaine Wood and Hawksworth Wood) - it is possible that the ancient woodlands could be impacted upon permanently by the pipeline construction due to inverversible impacts on there root structures. Pipeline route optimisation would be avoided if possible. The construction requirement of the various scheme proceed, and ancient woodland would be avoided if possible. 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 habitas 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 (deneficial)	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
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 with a population density of 1,448/km2. Once the pipeline has been constructed, the scheme will have no long term impact upon population, recreation and human health. An increase of 2.5Mi/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 (benficial)	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 along which the pipeline route runs adjacent to and cross that could be temporarily affected during the construction phase over a small area. 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 and usage of the number of open spaces and parks that the pipeline will pass through over the short term. However, construction and operation of the scheme wil not affect access to water-related recreation and environment.	n/a	n/a	n/a	n/a	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, 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 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 (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	The pipeline construction will cross and come into proximity of the River Aire. Short-term construction impacts should be miligated 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 into the River Aire. WFD assessment of Aire & Calder Carb Limestone/Millstome Grit/Coal measures has good status for most elements and poor for chemical status. Uncertain assessed status has been given to dependent surface water body status (risk of impacting on the flows in River Aire form Gill Beck to River Calder), and water balance (further investigation required despite same quantity of abstraction planned as previous scheme).	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA	A topics and objectives					Asses	sment of option			
Торіс	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 a nearby 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.	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.	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.	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 overail 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 AOMA 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 minor 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	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 5 listed building within 100m of the proposed scheme pipeline (5 Grade II and one Grade II ⁺). There are also three 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 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 GW source option 3								
Scheme description	This scheme is the third of the four third party borehole schemes. It requires acquisition of a borehole and is located approximately 4.15km from a WTW. It is assumed the licenced quantity previously held by the existing owner would be available from the borehole, which is 1.272MI/d. In the absence of a detailed investigation it is also assumed that the borehole will require a full refurbishment. The current scheme includes rehabilitating the borehole, installing equipment and headworks; and installing new pipework between the borehole and the 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. - Install new borehole infrastructure (submersible pumps, rising main, headworks, and installing new pipework). - Install new borehole infrastructure (submersible pumps, rising main, headworks, and installing new pipework). The scheme will use the existing processes and infrastructure at the WTW for water treatment and distribution. The scheme would uprovide a yield of 1.277MI/d								
SEA topics and objectives			Assessment of option						
Торіс	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)
Biodiversity, flora and fauna	1.1 To protect and enhance biodiversity, ecological functions, capacity, and babitat	The HRA assessed the potential impacts of the scheme on the European designated sites of South Pennine Moors SAC (UK0030280) South Pennine	Small	Moderate	Medium-term	Temporary	Low (adverse)	Low (adverse)	Negligible adverse

Торіс	Objective	Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)	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)	(likely to remain after reasonable mitigation)	(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 of South Pennine Moors SAC (UK0030200), South Pennine Moors Phase 2 SPA (UK0007022) and Peak District Moors (South Pennine Moors Phase 1) SPA (UK0007021). The hydrological impacts of concern for the SAC and SPA relate to surface erosion and guily formation. The proposed abstraction is unlikely to further contribute to these hydrological threats. The site borehole is also located near a town and is approximately 8km from the 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 1.272MI/d abstraction) was included in the RoC undertaken by the EA. Therefore the HRA concluded no likely significant effects. The pipeline is approximately 6km from the South Pennine Moors SSSI, but is outside the IRZ for this site. There is one LNR/LWS within proximity (125m) to the scheme (Gledholt Woods) 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
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 Mi/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	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 result in temporary disruption to informal recreational activities and access along the pipeline route. There are a number of noads, 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 fare as possible through liaison between YWS, 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)	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, 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
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 the River Colne 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 in the River Colne. 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

Residual beneficial effect
SEA	A topics and objectives					Assess	ment of option			
Торіс	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 WFD assessment concluded there are potential minor flow reduction impacts for Colne from Wessenden Brook to R Holme (GB10402706330) - 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.	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 in the River Colne.	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	 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 minor 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	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 significant number of listed buildings within proximity to the scheme pipeline. Excavation and construction required by the scheme has the polential 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 (Greenhead Park) 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.	Smail	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

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access to a resilient, hind quality. demand balance and is unlikely to cause a disproportionate effect on customer
sustainable and affordable supply of water bills as it provides water at reasonable cost.
over the long term.
Population and human 2.2 To protect and enhance the water The construction work may result in temporary disruption to informal recreational Small Moderate Short-term Temporary Low (adverse) Low (adverse) Negligible adverse Negligible
health environment for other users, including activities and access along the pipeline route. There are a number of roads,
recreation, tourism and navigation. railways, footpaths and public accesses that may be disrupted due to the pipeline
construction works with some traffic congestion likely. I hese effects will be
Intrigated as fair as possible through integrit model integrit and the second
However, the construction and operation of the scheme is not expected to have
an impact on access to water-related recreation and environment.
Material assets and group requires use 3.1 To reduce, and make more efficient, the demositie inductivial and companying inductivial and companying inductivial and companying use Small Moderate Long-term Permanent Low (adverse) Minor adverse Negligibility
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Image: Network and the service water demand, nor will a support the use of resources, industrial and commercial domestic, industrial and commercial consumption of resources, minimise the generation of waste, 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. Moderate Long-term Permanent Low (beneficial) Minor adverse built of the scheme of the scheme (-3km pipeline and a borehole upgrade). The scheme will make use of some of the existing borehole infrastructure. Once operational, minimal material inputs will be required, other than for regular Moderate Long-term Permanent Low (beneficial) Minor adverse built of the scheme of the scheme of the scheme of the scheme will will be required, other than for regular Notices Medium (adverse) Minor adverse Negligib Image: Description of waste, encourage its re-use and eliminate waste sent to landfill. Scheme (-3km pipeline and a borehole upgrade). The scheme will material inputs will be required, other than for regular Note of the scheme of
Image: Note of the section of waste sent to landfill. Medium (adverse) the size of the scheme (-Skm pipeline and a borehole upgrade). The scheme will be required, other than for regular maintenance but a small amount of additional resources will be needed for Moderate Long-term Permanent Low (beneficial) Minor adverse the size of the scheme (-Skm pipeline and a borehole upgrade). The scheme will maintenance but a small amount of additional resources will be needed for Small Moderate Long-term Permanent Low (beneficial) Minor adverse the size of the scheme (-Skm pipeline and a borehole upgrade). The scheme will make use of some of the existing borehole infrastructure. Nonce operation of additional resources will be needed for Negligibility

SE	A topics and objectives		Assessment of option								
Торіс	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 the River Cohe 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 in the River Cohe. The WFD assessment concluded no risk of deterioration in chemical status at a groundwater body scale (Aire & Calder Carb Limestone, GB40402G700400), 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 (Aire & Calder Carb Limestone), however further investigation is required. However, there is potential flow reduction impacts for Colne from Wessenden Brook to R Holme (GB104027063330), 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.	During construction, some of the works will be located within or in proximity to FRZs 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 in negligible. The additional abstraction will have a negligible effect on flood flows in the River Colne.	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 minor 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	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 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 exavation 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

R21 Dam Raising Option 1

Scheme description	Raise impounding water level by raising t The scope of permanent works is as follo - Remove existing concrete and dispose - Install new stainless steel dowels. - Install replacement concrete footbridge. There are three spans. The two edge spa The scheme would provide a yield of 0.28	he overflow weir by 0.7m, converting the overflow to a single level weir instead of the current tw ws: offsite. ans are approximately 15m and the middle span 15.25m. The bridges would be set above the e MM/d	vo-stage weir. This will increas	e storage capacity of the	e reservoir by 182MI. ted to provide access or	nto the bridges. The ram	ps would each be 13m	long.		
SEA	A topics and objectives 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)	Assessi 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 effec significance (liikely to remain after reasonable mitigation)
Biodiversity, flora and fauna	 To protect and enhance biodiversity, ecological functions, capacity, and habita connectivity within Yorkshire Water's supply and source area. 	HRA assessed the potential impacts of the scheme on the South Pennine Moors SAC (UK0030280), Peak District Moors (South Pennine Moors Phase 1) SPA (UK9007021), South Pennine Moors Phase 2 SPA (UK9007022) and Rochdale Canal SAC (UK0030286). The scheme is also within the South Pennine Moors SSSI IRZ. The scheme may result in an enlarged surface water area inundating some designated habitas around the existing reservoir margins. However, the total loss around the reservoir margins will be small in relation to overall habitat available within both of these sites; bird species are mobile and so are able to find alternative suitable habitat. Overall, it is considered that significant effects are unlikely, but further assessment is required to confirm this – please refer to HRA for further detais. Constlution with NE will be required during project planning. Construction works required for the scheme have the potential to temporarily impact on the qualifying features through noise and dust generation; however given the relatively minor nature of the works, it is considered this can be controlled through standard mitigation and appropriate timing to avoid bird breeding seasons. There is a potential but negligible benefit to non-designated wildfowl arising from the enlarged reservoir surface water area.	Small	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 regulation.	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 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
Population and human health	2.1 To protect and improve health and well-being and promote sustainable socio economic development through provisior of access to a resilient, high quality, sustainable and affordable supply of water over the long term.	Short term nuisance from noise, dust and vibration during the construction phase may have a minor adverse impact on human health and wellbeing. An increase of 0.28M/d in deployable output will make a minor contribution to maintaining 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) s	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.	Scheme construction will likely result in temporary disruption to some recreational activities over the short term. Given the location of the reservoir close to the South Pennine Moors and the presence of extensive footpaths and cycleways around and near to the reservoir and across the dam, there is likely to be some minor temporary impacts on recreation during the construction work. These will be mitigated as far as possible by footpath diversions and similar actions. There is no saling or angling activity at the reservoir. It is assumed that any public rights of way, footpaths and cycleways that are impacted by the higher top water level will be re-located such that there are no long-term adverse effects on recreational activity. The additional surface area of the area provides a negligible benefit to further recreation opportunity.	s 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, 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 (including precast concrete and steel) and removal of some concrete from the site. 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 to treat the additional raw water supplies provided. The scheme will make use of existing infrastructure.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Medium-term (adverse) Long-term (beneficial)	Permanent (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	Construction works will be in direct contact with the waterbody and the short-term construction impacts should be mitigated by close adherence to best practice methods to prevent pollution of the reservoir and the downstream compensation flow releases. The WFD assessment concluded that the chemical composition of the reservoir is unlikely to change during operation as inflow quality is unaffected and in-reservoir changes unlikely to be affected by minor change in reservoir volume.	Small	Moderate	Medium-term	Temporary	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 scheme will increase the deployable output of the reservoir by providing additional storage. There may be a negligible impact on downstream flows as a result of the greater storage capacity, with the volume of split water only slightly reduced. However, the WFD assessment concluded that impacts to the waterbody (GB104027062540) are unlikely.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk.	Increasing the reservoir capacity and surface water area may provide a beneficial impact on flood flow attenuation and / or flood storage on the downstream catchment, however this is expected to be negligible.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (Beneficial)	Negligible adverse	Negligible beneficial

SEA	topics and objectives					Assessr	nent of option			
Торіс	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 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.	Construction works will resulting in small-scale, temporary and medium-term disturbance to soils and land-use. The scheme will lead to minor permanent land-take due to the higher reservoir top water level. No long-term adverse effects are anticipated on geology or soils as a result of the scheme.	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.	The construction phase of the scheme will give rise to some temporary minor dust and emissions over the medium-term, but these will be minimised through best construction practices. The site is not within proximity of any AQMAs. Operation of the scheme will require minor additional water treatment chemical use, with a negligible adverse impact on air pollutant emissions.	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.	The construction phase of the scheme will give rise to some temporary GHG emissions over the medium-term, but these will be minimised through best construction practices. Operation of the scheme will require minor additional water treatment chemical use, with a negligible adverse impact on greenhouse gas emissions. It is anticipated that construction will result in emission of 234 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 contribution (0.28MI/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	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 one listed asset within 100m of the scheme (The New Inn, Grade II) but this will not be impacted by the increased top water level. The construction work does not require any substantive excavation works so there is unlikely to be any adverse effects on any unknown buried assets. Given the nature of the scheme it is not anticipated that any adverse impacts will occur to any cultural heritage assets.	Small	Moderate	Medium-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.	Construction activity is likely to lead to small-scale, temporary adverse effects on visual amenity to recreational users in the vicinity of the reservoir. Once operational, the enlarged reservoir surface water area is likely to be viewed by many as having a positive beneficial impact on the local landscape and visual amenity, although there is also likely to be others who consider it a non-natural additional intrusion on the local landscape.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

R23 Dam Raising Option 3

Scheme description	This scheme is one of three dam rais The scope of permanent works is as - Remove the existing concrete and c - Install new stainless steel dowels. - Place new units on mortar bed onto Increased yield of 0.05M/d	The is one of three daminating schemes rule with increase yield studge in a reservoir. It involves raising the top of the lower part of the overnow went of a Reservoir by roomin. This with increase reservoir studge capacity by 55 will the existing concrete and dispose offsite. w stainless steel dowels. y led of 0.05Mi/d											
SEA topi	cs and objectives					Assessme	nt of option						
Торіс	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	 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area. 	The HRA of the scheme assessed the potential impacts of raising the reservoir top water level by 0.15m upon the South Pennine Moors SAC (UK0300208), Peak District Moors (South Pennine Moors Phase 1) SPA (UK9007021), South Pennine Moors Phase 2 SPA (UK9007022) and Rochdale Canal SAC (UK0030266). The South Pennine Moors SSSI is also in proximity to the scheme. Overall, its considered that significant effects are unlikely, but further assessment is required to confirm this - see HRA for further details. It is also noted that increasing the reservoir surface area could have a negligible beneficial impact for some bird species but further work is required to assess this possible benefit. Construction works required for the Scheme have the potential to temporarily impact on the qualifying features through noise and dust generation; however given the relatively minor nature of the works, it is considered this can be controlled through standard mitigation and appropriate timing to avoid bird breding seasons. Consultation with NE will be required regarding mitigation for potential impacts on this SSSI during project planning. The scheme may have temporary minor impacts upon non-designated sites and biodiversity due to the construction activity and there is potential for permanent minor impacts on ecology due to a greater water surface area, inundating marginal ecology around the existing reservoir for longer periods of time.	Smail	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 regulation.	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 small risk of introducing/spreading INNS during construction, miligation 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			
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.	Short term nuisance from noise, dust and vibration during the construction phase, having a minor adverse impact on human health and wellbeing. An increase of 0.05Ml/d in deployable output will make a minor contribution to maintaining 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 (advise) 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.	Scheme construction will likely result in temporary disruption to some recreational activities over the short term. Given the location of the reservoir close to the South Pennine Moors and the presence of extensive footpaths and cycleways around and near to the reservoir and across the dam, there is likely to be some minor temporary impacts on recreation during the construction work. These will be mitigated as far as possible by footpath diversions and similar actions. There is no saling or angling activity at the reservoir. It is assumed that any public rights of ways, footpaths and cycleways that are impacted by the higher top water level will be relocated such that there race is long-term adverse effects on recreational activity. The additional surface area provides a negligible benefit to further recreation opportunity.	Small	Moderate	Short-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, encourage its re-use and eliminate waste sent to landfill.	The scheme will not help reduce water demand, nor will is support the use of sustainabilerenewable energy. Scheme construction will require some use of materials at a scale consistent with the size of the scheme (including precast concrete and steel) and removal of some concrete from the site. 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 to treat the additional raw water supplies provided. The scheme will make use of existing infrastructure.	Small (adverse) Small (beneficial)	Moderate (adverse) Moderate (beneficial)	Medium-term (adverse) Long-term (beneficial)	Permanent (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	Construction works will be in direct contact with the waterbody and the short-term construction impacts should be mitigated by close adherence to best practice methods to prevent pollution of the reservoir and the downstream compensation flow releases. Operation of the enlarged reservoir is unlikely to have any impact on water quality in the reservoir or to the downstream compensation flow releases. The chemical composition of the reservoir is unlikely to change as inflow quality is unaffected and in-reservoir changes unlikely to be affected by minor change in reservoir volume.	Small	Moderate	Medium-term	Temporary	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 scheme will increase the deployable output of the reservoir by providing additional storage. There may be a negligible impact on downstream flows as a result of the greater storage capacity, with the volume of spill water only slightly reduced. There is potential to impact on the waterbody (GB104027062520), however this is uncertain and requires further investigation.	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.	Increasing the reservoir capacity and surface water area may provide a beneficial impact on flood flow attenuation and / or flood storage on the downstream catchment, however this is expected to be negligible.	Medium	Moderate	Medium-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 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			

SEA topi	cs and objectives			Assessment of option Assessment of option of effect: hiphy and/or imedium / large) Certainty of effect (low / moderate / high) Duration of effect (short-term / medium imedium / large) Value / sensitivity of receptor (low / medium / high) Residual adverse effect (low / medium / high) Negligible adverse Residual adverse effect (low / medium / high) Residual adverse (low / medium / high) Negligible adverse Negligible Negligible Small Moderate Medium-term Temporary Low (adverse) Low (beneficial) Medium (adverse) Low (beneficial) Negligible Negligible Small Moderate Medium-term Temporary Low (adverse) Low (beneficial) Medium (adverse) Low (beneficial) Minor adverse Negligible Small Moderate Medium-term Temporary Low (adverse) Low (beneficial) Medium (adverse) Minor adverse Negligible								
Торіс	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 works will result in minor temporary and medium-term disturbance to soils and land-use. The scheme will lead to minor permanent land-take due to the higher reservoir top water level. No long-term adverse effects are anticipated on geology or soils as a result of the scheme.	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.	The construction phase of the scheme will give rise to some temporary minor dust and emissions over the medium-term, but these will be minimised through best construction practices. The site is not within proximity of any AQMAs. Operation of the scheme will require minor additional water treatment chemical use, with a negligible adverse impact on air pollutant emissions.	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.	The construction phase of the scheme will give rise to some temporary GHG emissions over the medium-term, but these will be minimised through best construction practices. Operation of the scheme will require minor additional water treatment chemical use, with a negligible adverse impact on greenhouse gas emissions. It is anticipated that construction will result in emission of 101 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 contribution (0.05Ml/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	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 known cultural heritage assets in proximity to the reservoir. The construction work does not require any substantive excavation works so there is unlikely to be any adverse effects on any unknown buried assets. Given the nature of the scheme it is not anticipated that any adverse impacts will occur to any cultural heritage assets.	Small	Moderate	Medium-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.	Construction activity is likely to lead to small-scale, temporary adverse effects on visual amenity to recreational users in the vicinity of the reservoir. Once operational, the small scale of the enlarged reservoir surface water area is unlikely to have any more than a negligible effect on landscape or visual amenity.	Small	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (Beneficial)	Negligible adverse	Negligible beneficial		

Scheme name	R24 Dam Raising Option 4									
	This scheme is one of three dam raisi	ing schemes that will increase yield storage in a reservoir. It involves raising the top of the top water level of a Reservo	oir by 1200mm.							
	The scope of permanent works is as f	follows:								
	 Remove the existing weir blocks. 									
	 Install new stainless steel dowels. 									
	 Fabricate new weir blocks to suit the 	e new top water level.								
	- Place new units on mortar bed onto	the dowels.								
Scheme description	 Fix new supports and baffles. 									
	 Lift the footbridge. 									
	- Supply and fix a waterproof door to t	the valve shaft entrance.								
	- Move the two outlets under the bridg	ge to a higher level.								
	- Provide a flood bund to protect the c	club house against extreme events.								
	- Adjust the sailing club slipways and	provide new hardstanding for boat storage.								
	The scheme would provide a yield of	2MI/d								
SEA to	pics and objectives					Assessi	nent of option			
			Scale of effect: geography		Duration of effect	Permanence of effect		Value / sensitivity of	Residual adverse effect	Residual beneficial effect
Topic	Objective	commentary: potential residual effect on sensitive receptors (assuming good practice construction	and/or population affected	Certainty of effect	(short-term / medium-	(permanent /	Magnitude of effect	receptor	significance	significance
		metnoas)	(small / medium / large)	(low / moderate / high)	term / long-term)	temporary)	(low / medium / nign)	(low / medium / high)	(likely to remain after	(likely to remain after
			(* * * * * 5,*,*		, , , , , , , , , , , , , , , , , , ,			(* *** 5,	reasonable mitigation)	reasonable mitigation)
Biodiversity, flora and	1.1 To protect and enhance	The HRA of the scheme assessed the potential impacts of raising the reservoir top water level by 1.2m upon the	Small	Low	Long-term	Permanent	Low (adverse)	High (adverse)	Moderate adverse	Negligible beneficial
fauna	biodiversity, ecological functions	South Pennine Moors SAC (UK0030280) Peak District Moors (South Pennine Moors Phase 1) SPA (UK9007021)	onidii	2011	Long tonn	1 officiation	Low (beneficial)	Low (Beneficial)		rtogiigibio boriolidia
laana	capacity, and babitat connectivity	and South Panning Moore Phase 2 SPA (1K9007022) The South Panning Moore SSSI is also in provimity to the					Low (boriolidia)	Low (Bononoidi)		
	within Yorkehire Water's supply and	and obtain channel woors i hase 2 of A (010007022). The obtain channel woors opons also in proximity to the								
	cource area	Increasing the normanent ton water level of the reservoir could notentially result in some minor loss of designated								
	source area.	habitst around the marries of the reservoir of the reservoir oblig polytomian resolution and the marries of the neuron ten								
		habitat alval is required in order to demonstrate an alegance of significant imports on the SAC features. Overall it is								
		water level is required in order to demonstrate an absence or significant impacts on the SAC readines. Overall, it is considered that significant affects are unlikely but further assessment is required to confirm this – places see HDA								
	1	for further detaile	1	1	1		1	1		
	1	In instant details.	1	1	1		1	1		
		In is also noted that increasing the reservoir surface area could have a negligible beneficial impact for some bird								
		species but further work is required to assess this possible benefit. Construction works required for the scheme nave								
		the potential to temporarily impact on the qualifying features through hoise and dust generation; however given the								
		relatively minor nature of the works, it is considered this can be controlled through standard mitigation and								
		appropriate timing to avoid bird breeding seasons.								
		Consultation with NE will be required regarding mitigation for potential impacts on this SSSI during project planning.								
		The scheme may have temporary minor impacts upon non-designated sites and biodiversity due to the construction								
		activity and there is potential for permanent minor impacts on ecology due to a greater water surface area, inundating	g							
		marginal ecology around the existing reservoir for longer periods of time. There is a potential but negligible benefit to								
		non-designated wildfowl arising from the enlarged reservoir surface water area.								
Biodiversity, flora and	1.2 To protect, conserve and enhance	The scheme may have negligible effects on the hydrological cycle at a local scale, by influencing surface water	Small	Low	Long-term	Permanent	Low (adverse)	Low (adverse)	Negligible adverse	Negligible beneficial
fauna	natural capital and the ecosystem	regulation.					Low (beneficial)	Low (beneficial)		
	services from natural capital that									
	contribute to the economy.									
Biodiversity, flora and	 To avoid introducing or spreading 	There is a small risk of introducing/spreading INNS during construction, mitigation measures will be implemented to	Small	Moderate	Long-term	Temporary	Low (adverse)	Low (adverse)	Negligible adverse	Negligible beneficial
fauna	INNS.	avoid this. Invasive species on site will be identified and removed or treated in advance of construction works.					Low (beneficial)	Low (beneficial)		
		Operation of the scheme is not expected to introduce or spread INNS.								
Population and human	2.1 To protect and improve health and	d Short term nuisance from noise, dust and vibration during the construction phase, having a minor adverse impact on	Small	Moderate (adverse)	Medium-term	Temporary (adverse)	Low (adverse)	Medium (adverse)	Minor adverse	Minor beneficial
health	well-being and promote sustainable	human health and wellbeing.		Moderate (beneficial)	(adverse)	Permanent (beneficial)	Low (beneficial)	Medium (beneficial)		
	socio-economic development through	An increase of 2MI/d in deployable output will make a beneficial contribution to maintaining the supply-demand			Long-term (beneficial)		. (
	provision of access to a resilient, high	balance and is unlikely to cause a disproportionate effect on customer bills as it provides water at reasonable cost.								
	quality, sustainable and affordable									
	supply of water over the long term									
			1							
			1							
	1									
Population and human	2.2 To protect and enhance the water	The reservoir is heavily used for recreational purposes, in particular for water sports with a Water Sailing Club	Small	Moderate	Medium-term	Temporary	Low (adverse)	Medium (adverse)	Minor adverse	Negligible beneficial
health	environment for other users, including	holding regular leisure events as well as competitive races and Royal Yachting Association training courses.		1			Low (beneficial)	Low (Beneficial)		
	recreation, tourism and navigation.	Recreational facilities include a clubhouse, berths for the boats, car parking and catering facilities. Temporary minor					. ,	· ,		
		impacts on access roads and on the surface water area available for sailing are likely during the construction works.								
		along with disruption to footpath and cycleway users.								
		Following completion of the construction works, the enlarged reservoir surface water area may provide a beneficial								
		impact by providing an increased sailing area. It is assumed that any public rights of way, footnaths and cycleways								
1	1	that are impacted by the higher top water level will be re-located such that there are no long-term adverse effects on	1	1	1		1	1		
1	1	other recreation.	1	1			1	1		
	1		1							
Material assets and	3.1 To reduce, and make more	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy.	Small (adverse)	Moderate (adverse)	Medium-term	Permanent (adverse)	Low (adverse)	Medium (adverse)	Minor adverse	Minor beneficial
resource use	efficient, the domestic, industrial and	Scheme construction will require some use of materials at a scale consistent with the size of the scheme (including	Small (beneficial)	Moderate (beneficial)	(adverse)	Permanent (beneficial)	Low (beneficial)	Medium (beneficial)		
	commercial consumption of	precast concrete and steel) and removal of some concrete from the site.	1		Long-term (beneficial)		,	(
	resources, minimise the generation of	Once operational minimal material inputs will be required, other than for regular maintenance but a small amount of	1							
	waste, encourage its re-use and	additional resources will be needed for treatment chemicals to treat the additional raw water supplies provided	1							
	eliminate waste sent to landfill	The scheme will make use of existing infrastructure	1							
			1							
1	1		1	1	1		1	1		
			1							
Water	4.1 To maintain or improve the quality	Construction works will be in direct contact with the waterbody and the short-term construction impacts should be	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible beneficial
1	of rivers, lakes, groundwater,	mitigated by close adherence to best practice methods to prevent pollution of the reservoir and the downstream	1	1	1		1	1		
	estuarine and coastal waterbodies	compensation flow releases.	1							
	1	Operation of the enlarged reservoir is unlikely to have any impact on water quality in the reservoir or to the	1	1	1		1	1		
		downstream compensation flow releases.	1							
1	1		1	1	1	1	1	1		

SEA top	pics and objectives					Assessi	ment of option			
Торіс	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 will increase the deployable output of the reservoir by providing additional storage. There will be a negligible impact on downstream flows as a result of the greater storage capacity, with the volume of spiil wate only isightly reduced. The scheme will result in change in water levels and the extent and distribution of marginal habitats. However, status cannot be assessed without current status (uncertain). The chemical composition is unlikely to change (currently Good). There is a potential risk of impact on the flows in the Black Brook - flow in the Black Brook would remain largely controlled by managed flow releases the Water, unimpacted by the scheme. The scheme would reduce the frequency and magnitude of high flows in the Brook further limiting morphological processes.	Small	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Minor adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk.	Increasing the reservoir capacity and surface water area will provide a minor beneficial impact on flood flow attenuation and/ or flood storage on the downstream catchment. (seasonal)	Medium	Moderate	Medium-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 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	 To protect and enhance geology, geomorphology, and the quality and quantity of soils. 	Construction works will resulting in minor temporary and short term disturbance to soils and land-use. The scheme will lead to minor permanent land-take due to the higher reservoir top water level. No long-term adverse effects are anticipated on geology or soils as a result of the scheme.	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.	The construction phase of the scheme will give rise to some temporary minor dust and emissions over the medium- term, but these will be minimised through best construction practices. The site is not within proximity of any AQMAs. Operation of the scheme will require minor additional water treatment chemical use, with a negligible adverse impact on air pollutant emissions.	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.	The construction phase of the scheme will give rise to some temporary GHG emissions over the medium-term, but these will be minimised through best construction practices. It is anticipated that construction will result in 518.84 tonnes of carbon Operation of the scheme will require minor additional water treatment chemical use, with a negligible adverse impact on greenhouse gas emissions.	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 contribution (2MI/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	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 old 17th century farm buildings near to the reservoir which are used as activity centres but which will not be impacted by the increased top water level. The construction work does not require any substantive excavation works so there is unlikely to be any adverse effects on any unknown buried assets.	Small	Moderate	Medium-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.	Construction activity is likely to lead to small-scale, temporary adverse effects on visual amenity to recreational users in the vicinity of the reservoir. Once operational, the enlarger reservoir surface water area is likely to be viewed by many as having a positive beneficial impact on the local landscape and visual amenity, although there is also likely to be others who consider it a non-natural additional intrusion on the local landscape.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (Beneficial)	Negligible adverse	Negligible beneficial

R29: Reservoir De-silting

Scheme description	This option explores the potential of or problems. In 1995, a study of 25 reservoirs was tax. For WRMP 2019 Yorkshire Water ha desilting.	le-silting reservoirs in order to restore lost storage capacity. A survey of Yorkshire Water upland rese carried out in the Yorkshire area to estimate the benefits of implementing a reservoir desilting schem s reviewed the reservoirs that should be desilted and recalculated the yield benefit. The review concl	rvoirs in the early 1990s ne. A cost was then estir luded there is still potenti	indicated that siltation wanted based on these fig al benefit from draining a	as quite serious in the Pe ures. As the waste would and removing sediment fr	nnine reservoirs (Mott Ma go to landfill, a cost of 60 om 26 reservoirs, listed b	acDonald, 1994) and the 0% of the unit cost per co elow. Data suggests the	yield of some reservoirs ubic metre of silt removed t the total capacity of res	was revised downwards of was added at that time t ervoir yield can be increa	due to siltation o cater for the landfill sed by 11MI/d through
SEA t	onics and objectives					Assessme	nt of option			
Торіс	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	 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. North Pennine Moors SAC (UK0030033); North Pennine Moors SPA (UK90050272); South Pennine Moors SAC (UK0030280); Peak District Moors (South Pennine Moors Phase 1) SPA (UK9007021); South Pennine Moors Phase 2 SPA (UK90070221); 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 the following sites: North Pennine Moors SAC; North Pennine Moors SAC; Peak District Moors (South Pennine Moors SAC; South Pennine Moors SAC; Peak District Moors (South Pennine Moors SAC; South Pennine Moors Pinke; Saturda and 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 reservoir (South Pennine Moors SSI; Cauryate SSI; Cauryate SSI; Cauryate SSI; Southere SSI; Gouthwalte Reservoir SSSI; as well as the Dark Peak Nature Improvement Area - these sites may similarly be temporarij impacted from extensive reservoir drawdown. Desil	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
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, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures. An increase of 11 MU 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 bordening 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 curtalied 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 o waste, 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 assosicated 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 the list below may reduce if environmental impacts are identified. Further details and investigational work are required to asses this scheme which will be made available in the final WRMP.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA topics and objectives Assessment of option										
Торіс	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 the list below may reduce if environmental impacts are identified. Further details and investigational work are required to asses this scheme which will be made available in the final WRMP.	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.	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 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 (2.5km from Broomhead Reservoir).	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 (11MI/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 hamilets 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 the Peak District and Yorkshire Dales National Parks, as well as Nidderdale 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

SEA	topics and objectives					Assess	ment of option			
Торіс	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.	An HRA screening assessment was undertaken to assess the potential impact of this scheme on the South Pennine Moors SAC (UK0030280) and South Pennine Moors Phase 2 SPA (UK907022). 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 my 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-designate 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. Subject to further investigation, WFD screening identified that reduced flow may affect habitat availability for fish and invertebrates with a risk of deterioration in invertebrate status for the Calder from Colden Water to Rybum Confluence (GB104027062611) surface water body. Macrophyte and phytobenthos status is not currently assessed and the potential reduction in dilution of phosphate and lower average velocities in the channel may affect plant growth, although this is considered neutral.	Smail	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
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 (557/km2) therefore it is expected that there will be some moderate scale impacts on well-being and health will occur. An increase of 10M/ld 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 bils. Operation of the scheme will not result in any improvements to human health or well-being, or improve access to recreation and the environment. Operation of the scheme will not affect access to open spaces and will have no bearing on recreation	Medium (adverse) Small (beneficial)	High (adverse) High (beneficial)	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 (Wellesley Park, amenities in Warley Town and a national cycle route), 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, 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 (including new pipeline to the WTW). 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 the Calder from Colden Water to Ryburn Confluence (GB104027052641) surface water body. 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. Subject to further investigation, reduced flow in the River Calder may lead to reduction in dilution of consented discharges and deterioration in Chemical Status. Supporting water quality in the waterbody is currently assessed as High status for ammonia and dissolved oxygen, but Poor status for Phosphate. Abstraction will reduce dilution of Iccal consented point discharges - the protection of low flow should not lead to deterioration in sanitary quality, but may impact on nutrient quality.	Smail	Low	Long-lerm	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA	topics and objectives		Assessment of option							
Торіс	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.	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) a very minor flow reduction. The abstraction would take place from Upper Calder unit of the Aire water resource managemen unit which has a status of 'Water Available' sufficient 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.	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.	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. The additional abstraction will not have any effects on flood flows in the River Calder.	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 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 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	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 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 (10Mi/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 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

MI/d.	The scheme requires a 15km pipeline from the intake to a WTW via another WTW in order to utilise the raw water storage.

Scheme description	Following improvements in the qua The proposed abstraction would be The scheme would provide a yield	Ity of water in the River Aire, abstractions from the river are now considered viable. This abstraction we in the Aire and Calder Catchment Abstraction Licensing Strategy. of 9.29MI/d average (10MI/d most days).	nsidered viable. This abstraction would have a capacity of 10MI/d. The scheme requires a 15km pipeline from the intake to a WTW via another WTW in order to utilise the raw water storage.									
SEA topic	cs and objectives					Assessme	ent of option					
Торіс	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 assessment considered the potential impact of the scheme on the North Pennine Moors SAC (UK003003), North Pennine Moors PA (UK9006722), South Pennine Moors SAC (UK0030280), South Pennine Moors Phase 2 SPA (UK9007022). The assessment concluded that three would be no likely significant effects on these European sites. The South Pennine Moors SSLS is in closer proximity to the scheme pipeline route but as concluded for the South Pennine Moors SSLS is in closer proximity to the scheme pipeline route but as concluded for the South Pennine Moors SSLS (construction impacts would be mitigated by best practice construction methods such that no significant effects are likely. Bingley South Bog 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 IR2s related to the Trench Meadows SSSI, South Pennine Moors SSSI and Bingley South Bog SSSI. Consultation with NE regarding mitigation for effects on these SSSIs will be required prior to commencement of works. The pipeline route runs through Stockbridge Nature Reserve and will discharge into a nearby Reservoir. It also passes in close proximity of Hirst Wood which is also 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. The WPID assessment indicates that reduced flow may lead to a deterioration in the status of fish and macro-invertebrate depending on their sensitivity to flow changes. Macrophyte and phytohenthos status is not currently assessed and the potential reduction in dilution of phosphate and lower average velocities in the channel may affect plant	Medium	Medium	Long-term	Permanent	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 to Stockbridge Nature Reserve and Saltaire WHS.	Medium	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial		
Biodiversity, flora and fauna	 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	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	Scheme construction may have minor, short-term adverse impact on residents located in population centres near to the pipeline route (notably Keighley, Riddles den and East Morton) 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 M/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 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 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 through the Satkaire WHS and there may be temporary disruption associated with the construction. However, construction and operation of the scheme wil not affect access to water-related recreation and environment therefore will result in negligible effects.	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, 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		

R35 River Aire Abstraction option 1

SEA topic	cs and objectives					Assessme	nt of option			
Торіс	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 coasta 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 a reduction in flow downstream of the intake, in the middle and lower reaches of this waterbody. Supporting water quality in the waterbody is currently assessed as High status for ammonia and dissolved oxygen, but Poor status for Phosphate. Abstraction will reduce dilution of local consented point discharges - the protection of low flow should not lead to deterioration in sanitary quality, but may impact on nutrient quality. A reduction of flow in the river as a result of increased abstraction may cause deterioration of the chemical status of the Aire (Eshton Beck to R Worth) WFD waterbody. Further investigation is required.	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 a reduction in flow downstream of the intake, in the middle and lower reaches of this waterbody. Local to the abstraction, indicative flows derived from gauged data indicate ~14% reduction in year round low flows (Q30) to moderate flows (Q50) with low to very low flows protected by a hands-off flow condition. The abstraction would take place from the Upper Mid Aire CAMS water resource management unit which has a status of "Water Available" sufficient 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.	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.	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. 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 and presents no real opportunity to increase awareness of water sustainability except in the medium-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 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	 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 through the Satatre World Heritage Site (WHS). 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.	The Utley Cemetery Registered Park and Garden is approximately 400m from the pipeline route. The pipeline will pass through the following ancient woodlands: Walker/Midgeley Woods, Hirst Wood, Old Spring Wood, Northcliff, Dungeon and Low Woods and Royds Cliff Wood. 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
 R37 River Aire Abstraction option 3

 This is the second of two potential new river abstractions on the River Aire. The abstraction follows improvement in the water quality of the river. The scheme was initially proposed in the 1994 Outline Resources Strategy.

 Scheme description
 This is the second of two potential new river abstractions on the River Aire. The abstraction follows improvement in the water quality of the river. The scheme was initially proposed in the 1994 Outline Resources Strategy.

 Scheme description
 The scheme involves the construction of a 8km pipeline, river intake, pumping station and road crossings. A combined capacity of up to 50MI/d should be available at both treatment works.

 The original scheme was developed with water transferred to a WTW for treatment. However, there is unlikely to be extra capacity at this WTW to treat water. Therefore existing infrastructure elsewhere could be used by transferring water to another WTW and further on to a Yorkshire town via the existing raw water mains between the two sites.

 The scheme would provide a yield of 46.44MI/d average (50MI/d most days).

SEA topics and objectives Assessment of option							ent of option			
Торіс	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 the potential impacts that the scheme might have on South Pennine Moors SAC (UK0030280), South Pennine Moors SAC (UK0030280), South Pennine Moors SPA (UK9007022), North Pennine Moors SAC (UK00300327), The HRA screening concluded that three would be no likely significant effect upon these sites from implementation of the scheme. In some places, the South Pennine Moors SSSI is situated within 500m of the scheme pipeline route placing the scheme in an SSSI impact Risk Zone. Consultation with NE regarding mitigation for potential impacts on this site will be required prior to commencement of works. The proposed pipeline also would be within 1 from of 20 ancient woodland sites. Potential temporary impacts could arise during the construction phase as result of noise and dust generation, but best practice design and construction should mitigate this risk to no greater than minor adverse effects. The pipeline will be required to reinvinks: Construction with three 1VSS: St Leonard's Farm, Baildon Moor and Graincliffe & Compensation Reservoir. Careful design will be required to ensure that the pipeline and construction activity avoids these sites and best practice construction methods will be required to innimise any temporary effects due to dust generation and vavid any permanent effect ansing from interception of sub-surface flows or extended there root structures. However, best practice construction nethods will be flowed so retended there root structures. However, best practice construction methods of an abilistar are assessed as more adverse given the scale of the abstraction relative to flows in the river Aire downstream of the sewage treatment works.	Medium	Moderate	Medium-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 However, the abstraction will be within licence limits and no major water-dependent features are likely to be affected by the abstraction. Temporary effects on recreation and easthetics are likely to occur due to disturbance to St Leonard's Farm LWS, Baildon Moor LWS and Graincliffe & Compensation Reservoir LWS.	i. Medium	Moderate	Medium-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.	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	Medium-term	Tempoary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Population and human health	2.1 To protect and improve health and well being and promote sustainable socio- economic development through provision access to a resilient, high quality, sustainable and affordable supply of water over the long term.	An increase of 50MM (in deployable output will help to maintain the supply-demand balance and is unikely to cause a disproportionat effect on customer bills as it provides water at reasonable cost. Operation of the scheme will not result in any improvements to humar f health or well-being, or improve access to recreation and the environment. 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 how population density. Localised, temporary traffic impacts associated with construction works will potentially cause mior 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, as well as liaison with highways authorities and local councils.	e Medium	Moderate	Medium-term	Temporary	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.	Pipeline construction and improvement activity will potentially result in temporary disruption to some recreational activities (e.g. Bradford Goff Club) over the short term. Furthermore, there are 53 Listed Buildings and 15 Scheduled Monuments in a 1km radius of the pipeline. Furthermore Saltaire WHS i also within 3km of scheme. 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 effects will be mitigated as far as possible by methods such as footpath diversion routes through liaison wit local stakeholders and councils. These temporary construction methods and through liaison between Yorkshire Water, the Highways Agency and local councils. Operation of the scheme will not affect access to open spaces and will have no bearing on recreation.	Medium s	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, encourage its re-use and eliminate waste sent to landfill.	This 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 (8km pipeline, river intake, pumping station and road crossings). The scheme will make use of some existing infrastructure. Once operational, minimal material inputs will be required, other than for regular maintenance but some additional resources will be needed for treatment chemicals and power for pumping.	Medium	High	Medium-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	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. Pollution risk from construction activity should be mitigated by best practice methods. The WFD screening assessment identified that a reduction of flow in the river as a result of increased abstraction may cause deterioration of the chemical status of the Aire (Gill Beck (Baildon) to River Calder) WFD waterbody. Further investigation is required. Supporting water quality in the waterbody is currently assessed as Moderate status for ammonia. High status for failosoided oxygen an Poor status for phosphate. Abstraction will reduce the dilution of the STW and other consented discharges. The protection of low flow should not lead to deterioration in sanitary quality, but may impact on nutrient quality. Once operational, the abstraction will be located just upstream of the STW, leading to a reduction in dilution of effluent. A further six STWs are located in the impacted reach downstream, resulting in minor adverse effects on water quality.	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.	WFD screening identified the greatest proportional change in the river flow regime would be a reduction in the moderate to low flow conditions from the abstraction, with a reduction in flow downsteam of the intake, in the middle and lower reaches of this waterbody. Indicative flows derived from downstream gauged data indicate ~13% reduction in year round moderate flows (GSO) and that the hands off flow is less than the year round low flows (QS9 and QS9). The abstraction would take place from the Upper MIA Aire CANK Swater resource management unit which has a status of 'Water Available' sufficient 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.	Medium	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

SEA	topics and objectives		Assessment of option									
Торіс	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.	During construction part of the pipeline will be located within or proximity to Flood Risk Zone 3. As such temporary mitigation measures may be required to alleviate flood risk. However, the pipeline will be buried and therefore the permanent effects on flood storage are assessed as minor (subject to the findings of any Flood Risk Assessment). 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 except in the short-term during the construction phase.	Small	Low	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial		
Soil, geology and land use	 To protect and enhance geology, geomorphology, and the quality and quantity of soils. 	Invasive species may be present at construction sites. There is a small risk of introducing/spreading INNS during construction, miligation measures will be implemented to avoid this. Invasive species on site will be identified and removed or treated.	Medium	Medium	Medium-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.	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.	Medium	Medium	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.	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 require a moderate amount of additional annual energy consumption associated with increased pumping and water treatment chemical use, with a minor adverse impact on greenhouse gas emissions.	Medium	Medium	Medium-term	Permanent	Medium (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.	An increase of 50MI/d in deployable output of this scheme would make a major 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	Medium-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 proposed pipeline route is located within 1km of 53 Grade II Listed Buildings and 15 scheduled monument, with potential for moderate adverse effects. Consideration will need to be given to 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. A watching brief, surveys and investigation would be implemented during construction to reduce the risk of adverse impact to any unknown heritage assets.	Medium	Low	Medium-term	Temporary	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.	If There are no designated landscapes associated with the scheme. During construction, the scheme will present some temporary effects on visual amenity in the local (non-designated) areas. The scheme is unlikely to have an impact on landscape and visual amenity during operation given that the pipeline will be buried and the other assets will be small-scale and located in urban settings.	Large	Medium	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial		

R49 Supply Dales from the Tees - treated

Scheme description	Raw water transfer to the Dales area provid The scheme would negate the need for Leig	ed by Northumbrian Water from a Pumping Station (RWPS) on the River Tees. This ru hton Reservoir water to be treated at a WTW, and would provide resilience to the Dal	equires construction of a new les area by delivering a 15 Mi	Vorkshire Water treatm /d supply of potable wate	ent works and the install er.	ation of a new 600mm d	iameter, 22.5 km pipelir	e running parallel to the	East Coast Mainline.	
SEA	topics and objectives					Assessi	nent of option			
Торіс	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 the North York Moors SAC (UK0030228) and North York Moors SPA (UK9006161). It concluded that there would be no significant adverse effects on these sites because there is no hydrological connectivity, the scheme abstraction is within an existing licence and in- direct impacts to be unlikely to affect qualifying features. The proposed pipeline falls within the IR2 of Hell Kettles SSSI and is in close proximity (<300 m) to a number of areas of ancient woodland. Consultation with NE regarding mitigation for impacts on the SSSI would be required during project planning. Potential impacts on the asset of ancient woodland would be negligible. The construction of the new WTW would have negligible adverse effects on a Coastal and Floodplain Marsh NERC habitat as the site is sufficiently distanced for moise and dust effects to be insignificant. 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	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 minor 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	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	 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 treatment processes at the new WTW will remove any INNS before water is distributed.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	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.	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 an unisance from noise, dust and vibration. These effects will be mitigated as far as possible through best practice construction measures and consultation with residents through lostal parish, town and district councils. The scheme would deliver 15 MI/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 minor, temporary adverse impacts on informal recreation due to 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.	Medium	High	Long-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, 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). 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	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. Construction of the pipeline has potential to have adverse effects on water quality in the River Tees and a number of stream sand 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.	Small	High	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.	I No adverse effects on surface or ground water flows are associated with operation of the scheme. The abstraction would be within existing abstraction licence and operating agreement conditions with no likely adverse effects on the aquatic environment. The construction of the pipeline has potential to have adverse effects on water flows and levels in the River Tees and a number of streams and brooks as a result of changes to drainage. However, the effects are likely to be negligible.	Small	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

SEA t	topics and objectives			Assessment of option						
Торіс	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.	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 below ground with only a very small footprint above ground. The effects on flood storage are therefore assessed as minor (subject to the findings of any Flood Risk Assessment and assuming the new pipe bridge is designed such that it does not impact on flood flows). The new WTW is not within or in close proximity to any Flood Risk Zones.	Small	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.	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 solls.	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 22.5 km) are considered temporary and reversible. The scheme would predominantly lie on Agricultural Land Classification 3. The WTW works only covers a small land area and the pipeline would 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 air emissions and dust in the long-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 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 2,620 tonnes of 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 and operation of the new WTW.	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 Leighton Reservoir water to be treated at a WTW and would provide resilience to the Dales area as well as allowing 15Ml/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 are numerous listed buildings and scheduled ancient monuments within 1 km of the scheme construction. The sensitivity of the monument would only be medium as it would not be highly sensitive to nuisance impacts at such a distance. There would be minor adverse construction effects on the setting of these designations, however, 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 scheduled ancient monuments to safe guard any archaeological remains.	Small	High	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 landscape designations in proximity to the scheme, however construction of the pipeline may have long-term but temporary impacts on local non- designated landscapes. The new WTW would be located adjacent to an existing WTW 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

R50 Supply Dales from the Tees - raw 1

Scheme name

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SEA	topics and objectives			1	1	Assessment	of option	1		1
Торіс	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 the North York Moors SAC (UK0030228), North York Moors SPA (UK9006161), Teesmouth & Cleveland Coast SPA (UK9006061) and Teesmouth & Cleveland Coast Ramsar (UK11068). It concluded that there would be no adverse effects on these sites because there will be either no hydrological connectivity or significant hydrological impacts and the proposed pipeline and infrastructure is sufficiently distanced for direct and in-direct impacts to be unlikely to affect qualifying features. The construction of the new WTW would have negligible adverse effects on a Coastal and Floodplain Marsh NERC habitat sub esite is sufficiently distanced for noise and dust effects to be insignificant. 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. The proposed pipeline, river intake and pumping station fail within the IRZ of Hell Kettles SSSI and is in close proximity (<300 m) to a number of areas of ancient woodland. The SSSI would only have medium sensitivity to construction effects such as dust emissions and noise disturbance so there would only be required during project planning. Potential impacts on the areas of ancient woodland would be requigible. WFD screening identified that subject to further investigation, reduced flow may affect habitat availability for fish and invertebrates with a risk of deterioration in invertebrate status in the channel may affect plant growth. Therefore, further investigation is required.	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.	The scheme may have adverse effects on fresh water provision services by influencing surface water flows through abstraction. The extent of flow reduction in the water body is currently unknown as the exact location of the abstraction is not confirmed, therefore further investigation is required.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	 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 raw water from the new intake on the Tees as the treatment processes at the new WTW will remove any INNS before water is distributed.	Medium	Moderate	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	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.	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, how and district councils. The scheme would deliver 15 Mi/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. 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 inpacts the water environment for other users.	Large	High	Long-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, 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, river intake and other pumping and treatment assets). 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	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 construction of the intake, pumping station and 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 negligible. Supporting water quality in the waterbody is currently assessed as High status for ammonia, Good status for dissolved oxygen, and High status for Phosphate. A new abstraction in the river will reduce dilution of local consented STW discharges. Macrophyte and phytobenthos status is Good however the potential reduction in dilution of phosphate and lower average velocities in the channel may affect plant growth. Therefore, further investigation is required. Subject to inturther investigation is required. Subject to status for discharges and elerioration in the River Tees may lead to reduction in dilution of consented discharges and deterioration in Chemical Status.	Large	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

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SEA	topics and objectives		1			Assessment	t of option			
Торіс	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 construction of the pipeline has the potential to have adverse effects on water flows and levels in the River Tees and a number of streams and brooks as a result of changes to drainage. However, the effects are unlikely to be significant. The operation of the new river intake on the River Tees (GB103025072190) has the potential to have adverse effects on water levels and flows. Indicative flow derived from gauged data suggests that low flow (G95) in the River Tees ranges between 332 Mi/d and 177Mi/d. An abstraction of 15 Mi/d will reduce low flow in river (G95) by 4.5% and 8.5% at each location respectively. The extent of flow reduction in the water body is currently unknown as the exact location of the abstraction is not confirmed, therefore further investigation is required.	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.	The river intake, pumping station and 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 below ground and the pumping ground would only have a small foodprint above ground. The effects on flood storage are therefore assessed as minor (subject to the findings of any Flood Risk Assessment and assuming the new pipe bridge is designed such that it does not impact on flood flows). The new WTW is not within or in close proximity to any Flood Risk Zones.	Large	Moderate	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.	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 22.5 km) are considered small scale, temporary and reversible. The scheme would predominantly lie on Agricultural Land Classification 3. 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.	Large	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 long-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 WTW would be minor.	Large	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 3,355 tonnes of 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 and operation of the new WTW.	Large	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 Leighton Reservoir water to be freated at a WTW and would provide resilience to the Dales area as well as allowing 15M/ld 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 are numerous listed buildings and scheduled ancient monuments within 1 km of the scheme construction. The sensitivity of the monument would only be medium as it would not be highly sensitive to nuisance impacts at such a distance. There would be minor adverse construction effects on the setting of these designations, however, 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 scheduled ancient monuments to safe guard any archaeological remains.	Small	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	 To protect and enhance designated and undesignated landscapes, townscapes and the countryside. 	There are no landscape designations in proximity to the scheme, however construction of the pipeline may have long-term, temporary impacts upon local non-designated landscapes. The new WTW would be located adjacent to an existing WTW 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

Part 1 of 2

R51 Supply Dales from the Tees - raw 2 Scheme name Treated water import from Northumbrian Water to supply Richmondshire local supply areas by utilising spare treatment capacity at a Northumbrian Water WTW. The scheme would involve the installation of a new pump in a new housing onsite. This pump would deliver treated water from the works into a new 600 mm pipeline that would run across the river Tees, under the A66 (M) and then cross country to a WTW. A new 300 mm branch from the pipeline would be connected into the CWT at the WTW. The new 600 mm would then continue in a south easterly direction through open land to the site of an existing WTW. The total length of the new pipeline would be 29.5 km to the existing WTW. A new buffer storage tank would be built at this WTW, with the capacity to provide 1.3 MI storage. This would also require the installation of two Scheme description further new pump sets. The scheme would provide up to 15 Ml/d. SEA topics and objectives Assessment of option Residual adverse effect Residual beneficial effect Scale of effect: geography Duration of effect Permanence of effect Value / sensitivity of Commentary: potential residual effect on sensitive receptors (assuming good significance Certainty of effect Magnitude of effect significance Topic Objective and/or population affected (short-term / medium-(permanent / receptor (low / moderate / high) (low / medium / high) (likely to remain after (likely to remain after practice construction methods) (small / medium / large) erm / long-term) temporary) (low / medium / high) reasonable mitigation) easonable mitigation) Biodiversity, flora and The HRA screening assessed potential impacts on the North Pennine Dales Meadows SAC (UK0014775). It concluded that there would be no adverse effects because there Long-term 1.1 To protect and enhance biodiversity, Medium Moderate Temporary Low (adverse) Medium (adverse) Minor adverse Negligible beneficial ecological functions, capacity, and habitat Low (beneficial) Low (beneficial) fauna connectivity within Yorkshire Water's supply is no hydrological connectivity between the scheme and the designated site and the ad (E. C. C. km) from the d

		direct impacts to be unlikely to affect qualifying features. The proposed pipeline falls within the IRZ of Swale Lakes SSSI and is in close proximity (34 m) to Black Scar Quarry SSI. The sensitivity of these sites to construction effects at this distance would be medium. Construction would generate dust emissions and noise disturbance with potential for minor impacts on the SSIs. Consultation with NE 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 300 m. 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 habitals, taking account of best practice mitigation measures and undertaking works at an appropriate time of year to minimise impact.								
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	 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	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	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.	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 MI/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 (deverse) 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. 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)	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, 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.	I 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					Assess	nent of option			
Торіс	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.	The pipeline would be located within approximately 4 km of Flood Risk Zone 2 with some smaller sections within Flood Risk Zone 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. 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.	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 burded 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 the 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 4,249 tonnes of 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 Leighton Reservoir water to be treated at a WTW 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 by 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.	There are no landscape designations in proximity to the scheme, however 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 would import raw water from a Northumbrian Water pumping station and combination of upgrading existing and developing new pipelines to supply the Yorkshire Water treatment works. The scheme would comprise a new pumping main and inline pumping station, connecting the existing main to a break pressure tank. In addition to a gravity flow, joining the existing treatment works. The scheme would comprise a new pumping main and inline pumping station, connecting the existing main to a break pressure tank. In addition to a gravity flow, joining the existing treatment works. The scheme would comprise a new pumping main and inline pumping station, connecting the existing main to a break pressure tank. In addition to a gravity flow, joining the existing treatment works delivery main. The scheme would fequire the construction of up to 50 km of pipeline. The scheme would deliver a combined transfer of up to 140Ml/d over three phases (50 Ml/d; 80 Ml/d and 140 Ml/d). The scheme is supported by additional releases from Kielder Reservoir and up to 50 Ml/d from Cow Green Reservoir in dry weather conditions.
Scheme description
The scheme would provide a vield of up to 140Ml/d in the phases:

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Phase 1: 50Ml/d
 Phase 2: 30Ml/d (total 80Ml/d)

Phase 2: 30MI/d (total 80MI/d)
 Phase 3: 60MI/d (total 140MId)

SEA topics and objectives Assessment of ontion Residual adverse Residual beneficial Scale of effect: geography ration of effect ence of eff /alue / sensitivity of ertainty of effect ommentary: potential residual effect on sensitive receptors (assuming good practice construction lagnitude of effect effect significance effect significance Topic Objective and/or population affected short-term / medium ermanent / receptor low / moderate / high) (low / medium / high) kely to remain after likely to remain after (small / medium / large) erm / long-term) mporary) low / medium / high asonable mitigation) easonable mitigation) Biodiversity, flora and fauna 1.1 To protect and enhance biodiversity. The HRA screening assessed potential impacts on the North Pennine Moors SAC (UK0030033). North Pennine Negligible beneficial Medium Low Long-term Permanent High (adverse) Medium (adverse) ecological functions, capacity, and habitat Moors SPA (UK9006272), Moor House - Upper Teesdale SAC (UK0014774), North Pennine Dales Meadows Low (beneficial) Low (beneficial) connectivity within Yorkshire Water's supply SAC (UK0014775), North York Moors SAC (UK0030028), North York Moors SPA (UK9006161), Irthinghead and source area Mires Ramsar (UK11032) and Border Mires, Kielder - Butterburn SAC (UK0012923). It concluded that the proposed pipeline and infrastructure required to support the scheme is sufficiently distanced from the all the designated sites for direct and in-direct construction impacts to be unlikely to affect gualifying features. uring operation, flow releases from Cow Green reservoir and an existing pipeline from the Kielder to support the 80 MI/d and 140 MI/d schemes may have adverse effects on some of these European sites and a number of SSSIs (Upper Teesdale: Middle & Side Stonyoill Meadows: Shipley & Great Woods). The potential adverse effects are uncertain and further investigation is required. The proposed pipeline falls within the IRZ of Hell Kettles SSSI and is in close proximity (<300 m) to a number of area of ancient woodland. Construction would generate dust emissions and noise disturbance with potential for minor impacts on the SSSI. Consultation with NE would be required during project planning. Potential impacts on the areas of ancient woodland would be negligible The pipeline passes directly through a coastal and flood plain grazing marsh NERC habitat. The construction of the pipeline would result in habitat loss. However, impacts would only be temporary as the pipeline would be buried and the habitat would recover. Impacts on species found within the habitat would be minimised through best practice construction techniques and the implementation of appropriate mitigation measures. Construction of the various scheme assets, including the pipeline and works at the water treatment works will have temporary (1-2 vears) effects on non-designated habitats, taking account of best practice mitigation measures and undertaking works at an appropriate time of year to minimise impact. Previous investigations of the Tees direct pipeline option identified a risk to fish species in the River Tees in relation to changes in water chemistry, disease transfer risks, invasive species migration, temperature and flow/level changes due to River North Type transfers to the River Tees in very dry conditions. Biodiversity, flora and fauna 1.2 To protect, conserve and enhance Scheme construction and operation may have adverse effects on ecosystem services such as fresh water Medium Low Long-term Medium (adverse Minor adverse Negligible beneficial Permaner Low (adverse natural capital and the ecosystem services ovisioning, water regulation, and cultural services Low (beneficial) Low (beneficial) from natural capital that contribute to the vmono Biodiversity, flora and fauna 1.3 To avoid introducing or spreading INNS. Previous investigations of the Tees direct pipeline option identified a risk to native white clawed cravifsh in Medium (adverse) Moderate (adverse) Temporan Negligible beneficial large Low I ong-term relation to the spread of invasive signal crayfish and crayfish plague in the Tees catchments as a result of flow Low (beneficial) Low (beneficial) and level changes. 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 an uncertain risk of increasing the spread of aquatic INNS from Kielder to the Tees. Further assessment s required Population and human 2.1 To protect and improve health and well-For the majority of its length, the proposed pipeline route runs through agricultural land or adjacent to main roads. Medium (adverse) Long-term (adverse) Temporary (adverse) Medium (adverse) High (adverse) Low (adverse) Minor adverse being and promote sustainable sociolowever there are areas where the pipeline construction work would come in proximity to residential areas with Large (beneficial) High (beneficial) Long-term (beneficial) Permanent (beneficial High (beneficial) Medium (beneficial) hoalth economic development through provision of the potential for some adverse effects from construction, such as nuisance from noise, dust and vibration. These access to a resilient, high quality, sustainable effects will be mitigated as far as possible through best practice construction measures and consultation with and affordable supply of water over the long residents through local parish, town and district councils. The scheme would deliver up to 140 MI/d helping to maintain essential public water supplies and therefore help naintain 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. Population and human 2.2 To protect and enhance the water The construction activity will have a minor, temporary adverse impact on informal recreation due to temporary Medium High Long-term Temporary Low (adverse) Medium (adverse) Minor adverse Negligible beneficial disruption to some recreational facilities such as public paths and rights of way. These effects will be mitigated as ealth nvironment for other users, including Low (beneficial) Low (beneficial) recreation, tourism and navigation. 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 vironment in the local area. 3.1 To reduce, and make more efficient, the The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy Material assets and L arge High I ong-term Permanen Medium (adverse Medium (adverse) Moderate adverse Negligible beneficial esource use domestic, industrial and commercial Scheme construction will require some use of materials at a scale consistent with the size of the scheme (pipeli Low (beneficial) Low (beneficial) consumption of resources, minimise the and pumping station) generation of waste, encourage its re-use Once operational, minimal material inputs will be required, other than for regular maintenance but some minor and eliminate waste sent to landfill. additional resources will be needed for treatment chemicals and power for pumping. Wate 4.1 To maintain or improve the quality of The scheme was screened out of WFD assessment. Medium Medium (adverse) Negligible beneficial Hiat Long-term Low (adverse) Minor adverse Temporary rivers, lakes, groundwater, estuarine and The construction of the pipeline has potential to have adverse effects on water quality in the River Tees and a Low (beneficial) Low (beneficial) coastal waterbodies 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. The scheme is unlikely to affect water quality in the long term, with no net increase in abstraction downstream of the River Tees intake due to the reservoir regulation releases. 4.2 To avoid adverse impact on surface and No adverse effects on surface or ground water flows associated with normal 50 MI/d operation of the scheme. Medium Medium (adverse) Negligible beneficial Wate Low Long-term Permanen Medium (adverse Moderate adverse groundwater levels and flows, and ensure Under the 80 and 140 MI/d variants of the scheme, there would be significant increases in flows downstream of Low (beneficial) Low (beneficial) sustainable management of abstractions Cow Green reservoir to the Northumbrian Water abstraction. The construction of the nineline has notential to have adverse effects on water flows and levels in the River Tees and a number of streams and brooks as a result of changes to drainage. However, the effects are likely to be negligible.

SEA	topics and objectives					Assessmer	nt of option			
Торіс	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.	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 below ground with only a very small footprint above ground. The effects on flood storage are therefore assessed as minor (subject to the findings of any Flood Risk Assessment and assuming the new pipe bridge is designed such that it does not impact on flood flows). Increased flows in the Tees associated with the releases from Cow Green Reservoir and the pipeline from Kielde would have adverse effects on flood risk. However, these effects would be outside of normal operations and temporary.	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.	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 50 km) are considered temporary and reversible. The scheme would predominantly lie on Agricultural Land Classification 3. The pipeline would be buried so would only have temporary effects, as such, the adverse effects on land-use would be minor.	Large	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 long-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 increased operations would be negligible.	Large	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 a minor increase in GHG 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 and increased operations at the WTW.	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 scale of this scheme would make a major 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	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.	There are numerous listed buildings and scheduled ancient monuments 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. However, the majority of these are located adjacent to major roads and as such it is unlikely that pipeline construction will result in adverse effects apart from very short term (1 month) local disturbance to their setting. However, the scheme will not affect their physical setting or access over the short-term. The pipeline construction could affect unknown buried resources. Mitigation would be dependent on further study at the time. If required, a watching brief, surveys and investigation would be put in place to minimise risk of harm to unknown assets.	Medium	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 Howardian Hills AONB is located over 2km away from the pipeline route and would not be directly affected by construction or operational activities. Any temporary impact on visual amenity to the AONB is therefore assessed as no greater than minor adverse. There is the potential for adverse visual impacts due to lower water levels in Cow Green and Kielder Water reservoirs as a result of the additional abstraction compared to current operations. However, there is also potential for beneficial impacts on river reaches where flows are increased by the regulation releases to the River Twe and River Tees.	Medium	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial

Scheme name R56 Tees - Ouse Pipeline Option 2

The details of this scheme are similar to R54 and it also provides a yield of up to 140Ml/d in three phases. This option however includes a new Yorkshire Water intake and pumping station on the River Tees.

Scheme would import water by constructing a new Yorkshire Water intake and pumping station on the Tees and completing the pipeline connection between the River Tees at Blackwell and the Yorkshire Water treatment works at Elvington. Assets required would include a new pumping main and inline pumping station, connecting to the existing Birkby to Blackwell and the Yorkshire Water treatment works at Elvington. Assets required would include a new pumping main and inline pumping station, connecting to the existing Birkby to Blackwell and the Yorkshire Water treatment works at Elvington. Assets required would include a new pumping main and inline pumping station, connecting to the existing Birkby to Blackwell and the Yorkshire Water treatment works at Elvington. The scheme is supported by flow releases from either Kielder Water or Cow Green Reservoir. Operation of the scheme is elvington water delivery main. The scheme would require the construction of up to 50 km of pipeline. The scheme is supported by flow releases of up to 50 km of pipeline. The scheme is oblived from Cow Green Reservoir in dry weather conditions.

PUBLIC

The scheme would provide a yield of a yield of up to 140MI/d in three phases: - Phase 1: 50MI/d

- Phase 2: 30MI/d (total 80MI/d) Phase 2: 60MI/d (total 140Mid)

SEA	topics and objectives					Assessm	ent of option			
Торіс	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	 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 the North Pennine Moors SAC (UK0030033), North Pennine Moors SAC (UK0006272), Motor House - Upper Teesdale SAC (UK001775), North Ponine Dales Meadows SAC (UK001775), North Porine Dales Meadows SAC (UK00174775), In concluded that the proposed pipeline and infrastructure required to support the scheme is sufficiently distanced from the all the designated sites for direct and in-direct construction impacts to be unlikely to affect qualifying features. During operation, flow releases from Cow Green reservoir and a existing pipeline from the Kielder to support the 80 Mild and 140 Mild schemes would exist in uncertain adverse effects on some of the European sites and a number of SSS (Upper Teesdale; Niddle & Sidel Stongy) Il Meadows; Shpley & Great Woods). The new YW river abstraction on the Tees would be supported by the releases from Cow Green reservoir and Kielder so it would not be likely to have any impacts on designated sites downstream. The proposed pipeline fails within the IR2 of Hell Kettles SSSI and is in close proximity (<300 m) to a number of area of ancient woodland. Construction would generate dust emissions and noise disturbance with potential for minor impacts on the SSSI. Consultation with NE would be required during project planning. Potential impacts on the pipeline asses directly through a coastal and flood plain grazing marsh NERC habitat. The construction of the pipeline would recover. Impacts on species found within the IR2 of various scheme assets, including the pipeline and would be impacting accusate and the habitat would erecover. Impacts on species found within the habitat would berown of a reador of construction techniques and the implementation of appropriate imagitation mea	Medium	Low	Long-term	Permanent	High (adverse) Low (beneficial)	Medium (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.	Scheme construction and operation may have adverse effects on ecosystem services such as fresh water provisioning, water regulation, and cultural services.	Medium	Low	Long-term	Permanent	Low (adverse) Low (beneficial)	Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	 To avoid introducing or spreading INNS. 	Previous investigations of the Tees direct pipeline option identified a risk to native white clawed crayfish in relation to the spread of invasive signal crayfish and crayfish plague in the Tees catchments as a result of flow and level changes. 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 an uncertain risk of increasing the spread of aquatic INNS from Kielder to the Tees. Further assessment is required.	Large	Low	Long-term	Temporary	Medium (adverse) Low (beneficial)	Moderate (adverse) Low (beneficial)	Moderate adverse	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.	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 listrict councils. The scheme would deliver up to 140 MI/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.	High (adverse) High (beneficial)	High (adverse) High (beneficial)	Long-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.	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. 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.	Medium	High	Long-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, 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 (river intake, pipeline and pumping station). 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	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.	Medium	Moderate	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.	No adverse effects on surface or ground water flows associated with normal 50 MI/d operation of the scheme. Under the 80 and 140 MI/d variants of the scheme, there would be significant increases in flows downstream of Cow Green reservoir to the Northumbrian Water abstraction. The construction of the pipeline has potential to have adverse effects on water flows and levels in the River Tees and a number of streams and brooks as a result of changes to drainage. However, the effects are likely to be negligible.	Medium	Low	Long-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

SEA	topics and objectives					Assessm	ent of option			
Торіс	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. 	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 below ground with only a very small footprint above ground. The effects on flood storage are therefore assessed as minor (subject to the findings of any Flood Risk Assessment and assuming the new pipe bridge is designed such that it does not impact on flood flows). Increased flows in the Tees associated with the realeases from Cow Green Reservoir and the pipeline from Kielder would have adverse effects on flood risk. However, these effects would be outside of normal operations and temporary.	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.	N/A	N/A	N/A	N/A	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	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 50 km) are considered temporary and reversible. The scheme would predominantly lei on Agricultural Land Classification 3. The pipeline would be buried so would only have temporary effects, as such, the adverse effects on land-use would be minor.	Large	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 long-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 increased operations would be negligible.	Large	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 a minor increase in GHG 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 and increased operations at Elvington WTW.	Medium	High	Long-term	Permanent	High (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 major 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	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.	There are numerous listed buildings and scheduled ancient monuments 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. However, the majority of these are located adjacent to major roads and as such it is unlikely that pipeline construction will result in adverse effects apart from very short term (1 month) local disturbance to their setting. However, the scheme will not affect their physical setting or access over the long term. The pipeline asses through a registered historic battlefield. It is also possible that the excavation works for the pipeline construction could affect unknown buried resources. Mitigation would be dependent on further study at the time. If require, a watching brief, surveys and investigation would be put in place to minimise risk of harm to unknown assets. In the longer term, no adverse effects are anticipated from operation of the scheme.	Medium	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 Howardian Hills AONB is located over Zkm away from the pipeline route and would not be directly affected by construction or operational activities. Any temporary impact on visual amenity to the AONB is therefore assessed as no greater than minor adverse. There may be other small-scale, temporary adverse effects on visual amenity during construction. There is the potential for adverse visual impact due to lower water levels in Cow Green and Kielder Water reservoirs as a result of the additional abstraction compared to current operations. However, there is also potential for beneficial impacts on river reaches where flows are increased by the regulation releases to the River Tyne and River Tees.	Medium	Moderate	Long-term	Temporary	Low(adverse) Low (beneficial)	Medium (adverse) Medium (beneficial)	Minor adverse	Minor beneficial

Scheme name	R58 Transfer from UU Option 3									
Scheme description	This option is the first of two transfer scheme the Grid SWZ. The existing bulk supply point The scheme would provide a yield of 1Ml/d.	s to import water from United Utilities' Integrated Resource Zone to Yorkshire Water's Grid SWZ. The sch would require upgrading, which would include the installation of a replacement connection valve and a 500	eme would utilise an existing m length of 160mm OD PE pip	connection to a 13" Unite beline in the A6033 Roch	ed Utilities pipe on the bo dale Road.	undary of United Utilities	and Yorkshire Water's su	pply areas. The pipeline	would be used to import 1	MI/d to Todmorden in
SEA	topics and objectives					Assessment	of option			_
Торіс	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	 To protect and enhance biodiversity, ecological functions, capacity, and habitat connectivity within Yorkshire Water's supply and source area. 	HRA screening assessed potential impacts on the South Pennine Moors SAC (UK003220), South Pennine Moors Phase 2 SP4 (UK0907022) and Peak District Moors (South Pennine Moors Phase 1) SPA (UK9007021). It concluded that there would be no adverse effects on these 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 the South Pennine Moors 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 the Rochdale Canal LWS and 600m from the Ramsden Clough LWS. However, the limited scale of works means that impacts on these sites would be negligible.	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.	No adverse impacts on natural capital or ecosystem services are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	 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 (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	Potential adverse effects on a village 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 Mild 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, including the A6033 Rochdale Road. 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 (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, 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 contruct new infrastructure.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	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 scheme was screened out of WFD assessment. The construction of the 500m pipeline has the potential to have adverse effects on water quality in the in streams and brooks adjacent to the A6033 Rochdale Road, however effects are expected to ne negligible assuming best practice construction techniques. No adverse effects on surface or ground water quality are anticipated during operation, as the scheme would utilise water already within United Utilities' Integrated Resource Zone.	Small	High	Short-term	Temporary	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.	No adverse effects on surface or ground water levels and flows are anticipated during construction or operation. The scheme would utilise water array within United Utilities 'Integrated 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.	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	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

N/A

N/A

Small

Small

N/A

N/A

High

High

N/A

N/A

Short-term

Long-term

N/A

N/A

Temporary

Permanent

reserve so the effects on flood storage are therefore assessed as negligible.

associated with the energy required to pump the additional 1 MI/d of supply.

There are no opportunities for raising awareness of water sustainability and the efficient use of water

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

The pipeline would be within the existing road reserve so would not have any adverse effects on geological features, soils or land use.

movements and construction activities. There would be a negligible increase in GHG emissions

Operation of the scheme is not likely to affect flood risk.

hrough best practice construction techniques.

6.2 To minimise greenhouse gas emissions. Scheme construction would be associated with a negligible increase in GHG emissions from HGV

Water

Air and climate

Air and climate

4.4 To increase awareness of water

Soil, geology and land use 5.1 To protect and enhance geology, geomorphology, and the quality and quantity

of soils.

sustainability and efficient use of water.

6.1 To maintain and improve air guality.

N/A

N/A

Low (adverse) Low (beneficial)

Low (adverse)

Low (beneficial)

N/A

N/A

Low (adverse) Low (beneficial)

Low (adverse)

Low (beneficial)

Negligible adverse

Negligible adverse

Negligible adverse

Negligible adverse

Negligible beneficial

Negligible beneficial

Negligible beneficial

Negligible beneficial

SEA	A topics and objectives					Assessmen	t of option			
Торіс	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 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 (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 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 (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Landscape and visual amenity	 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 the village, however, they would be short-term and temporary.	Small	High	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial

Scheme description	This option is the second of two transfer sch The point of connection is a bulk supply poir allowing the existing supply to these villages	emes to import water from United Utilities Integrated Resource Zone. It would provide a treated import to n United Utilities' watercourse. Infrastructure required includes new transfer pumping station, hyports to be used elsewhere in the Grid SWZ.	ort of 1MI/d. ochlorite dosing, orthophosph	ate dosing and a new 6	km length, 250mm diam	eter pipeline to High Ber	ntham. The import could	l be used to supply High	Bentham villages' demand w	vith surplus going to Ingleton,
SE	A topics and objectives					Assess	ment of option			
Торіс	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 the Ingleborough Complex SAC (UK012782) and Bowland Felis SPA (UK005151). 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) Robert Hall Moor 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 Clear Beck Meadow 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 (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Biodiversity, flora and fauna	 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 (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. 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 (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	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.	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 Mi/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 (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 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 (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, 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 scheme was screened out of WFD assessment. The construction of the pipeline has potential to have adverse effects on water quality in a number of streams and brocks 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 on more than minor. No adverse effects on surface or ground water quality associated with operation of the scheme are anticipated. If 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.	Medium	High	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 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.	a Small	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial
Water	4.3 To reduce and manage flood risk.	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 (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name

R59 Transfer from United Utilities Option 4

SEA	A topics and objectives					Assessr	ment of option			
Торіс	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.	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 (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 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 (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 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 MI/d of supply.	Medium	High	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 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 (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 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 (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 construction of the pipeline would have temporary effects on the landscape setting of the Forest of Bowland AONB, however, they would be medium-term and temporary.	Medium	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Moderate adverse	Negligible beneficial

Scheme name	R61 East Yorkshire coast desalination									
Scheme description	Scheme involves the construction and operati requires construction of a 26 km pipeline.	on of a desalination plant utilising brackish water from beach wells or groundwater. Ultrafiltration (UF) must	embranes are proposed as the	e pre-treatment option. T	he scheme would requir	e an ocean outfall includ	ing on-shore and off-sho	re pipelines to transport t	the water to the discharge po	int. The scheme also
SE 4	tenies and chiestives					A	nent of ention			
Торіс	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, equacity, and habitat connectivity within Yorkshire Water's supply and source area.	The HRA screening assessed potential impacts on the Hornsea Mere SPA (UK8006171) and Humber Estuary SAC/SPARamsar. It concluded that there would be no adverse effects on the Hornsea Mere SPA because it is not hydrologically linked to and is sufficiently distanced for adverse effects on the Mitth respect to the Humber Estuary SAC (UK0030170), Humber Estuary SPA (UK9006111) and, Humber Estuary Ramsar (UK11031), although the abstraction of seawater is unlikely to have a significant impact on water quantity in the estuary and 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 alter hydrological process through which intertidal and sub-tidal habitats are supported. The abstraction may potential to significant impact or qualifying features of the designated site, notably habitats and fish and bird species, through noise and vibration generation, pollution and habitat loss. Whist most of these effects are likely to be reduced through mitigation, further information and justification is required to rule out impacts. The construction of the 26km connection pipeline also intersects the impact risk zone of several SSISIs (Pullin Bog), Tophil Low and Leven Canal). Consultation with NE would be required during project planning. There would also be potential minor adverse effects on a number of LNRs (Rockford Fields, Noddle Hill) and Local Wildlife Sites (Figham Pastures, Swine Moor, Watton Car) in proximity to the pipeline.	Large	Low	Long-term	Permanent	Medium (adverse) Low (beneficial)	High (adverse) Low (beneficial)	Major adverse	Negligible beneficial
Biodiversity, flora and fauna	 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.	Small	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	Moderate	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	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 phase of the scheme may also 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 MI/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.	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	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 public right of ways, footpaths and access 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.	Large	High	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, 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 (RO desaination 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.	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 in the Humber Estuary. 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 in the Humber Estuary. WFD screening assessed effects on the Humber Lower transitional waterbody (GBS304(2020201). The water body is associated with five surface water initiate vulnerable zones. However, the scheme will not affect the management of the protected area and no significant changes in water is discharged with STW effluent in zone of good mixing. The WFD screening concluded there would be no detrioration between status classes, no compromises to waterbody becitives and no impact on other water bodies.	Large	Moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Large

Moderate

Long-term

Permanent

Low (adverse)

Low (beneficial)

Low (adverse)

Low (beneficial)

Negligible adverse

Negligible beneficial

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 an essentially limitless 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 from the Humber Estuary, however, the effect on residence time of freshwater is considered imperceptible. Effects are therefore assessed as negligible.

Water

PUBLIC

SEA	topics and objectives					Assessr	ment of option			
Торіс	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.	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. The desailnation plant is also in Flood Zone 3, however benefits from flood defences.	Large	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.	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 solls.	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 26 km) are considered temporary and reversible. The scheme would lie on some small areas of urban land and mostly cover Agricultural Land Classification 3, which is medium land value. The WTW works only covers a small land area and the pipeline would be burled 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	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 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 RO 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 15,762 tonnes of GHG emissions from HGV movements and construction activities. Whilst the scheme will operate by reverse osmosis desailnation 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 is a registered park and garden and there are numerous listed buildings and scheduled ancient monuments within 1 km of the scheme construction. There is potential for adverse construction effects on the setting of these designations. Although scheduled ancient monuments are high value receptors, they would not be particularly sensitive to dust emissions and noise disturbance from a distance. 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 scheduled ancient monuments to safe guard any archaeological remains.	Small	Moderate	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 landscape designations in proximity to the scheme, however, construction of the pipeline may have long-term, 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	Long-term	Temporary	Medium (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Scheme name R62 North Yorkshire Rural Distribution enhancement

Scheme description This option involves transferring water via a new pipeline. The abstraction would be within the existing licence

SEA topics and objectives			Assessment of option								
			Scale of effect:		Duration of affect	Bormonon		Value / constituite	Residual adverse effect	Residual beneficial effect	
Торіс	Objective	Commentary: potential residual effect on sensitive receptors (assuming good practice construction methods)	population affected	Certainty of effect	(short-term / medium-	(permanent /	Magnitude of effect	receptor	significance	significance	
			large)	(iow / moderate / mgn)	term / long-term)	temporary)	(low / median / nigh)	(low / medium / high)	reasonable mitigation)	reasonable mitigation)	
Riediversity flore and	1.1 To protect and enhance bigdiversity	The HPA corporate according to the light of the Lewer Deputy Valley SAC (11/0012944). Diver Deputy SAC	Lorgo	Modorata	Long form	Tomporony	Modium (odvorso)	Modium (advorso)	Moderate advarge	Nogligible beneficial	
fauna	ecological functions, capacity, and habitat	(UK0030253), Lower Derwent Valley SPA (UK9006092) and Lower Derwent Valley Ramsar (UK11037). It concluded that the	Large	woderate	Long-term	remporary	Low (beneficial)	Low (beneficial)	wouerate auverse	Negligible benencial	
	connectivity within Yorkshire Water's supply and source area.	construction activities could impact on the designated sites. The construction activities will be located within the IRZ of the designated sites. Construction would generate dust emissions and noise disturbance with potential for moderate impacts on									
		the SSSI and SAC. This includes approximately 3.8km of pipeline near a YWSL WTW across the River Derwent SSSI and									
		effects towards the SAC and the designated features include physical modification of rivers, water pollution, water abstraction									
		and changes in land management. In both cases, impacts on the SAC and SSSI are unlikely should construction activities be									
		walkover with hydrologist and ecologist for route optimisation. The Route could also be re-aligned to exclude this section,									
		although the incorporation of standard mitigation measures will reduce the extent of any impacts. Therefore, an AA may be required to determine the effectiveness of mitigation measures to minimise impacts on the river.									
		Lower Derwent Valley SPA and Ramsar designated for a number of breeding and overwintering birds. The only concern is									
		disturbances could impact on bird community. However, most impacts could be avoided by timing of the works to outside									
		winter period. The remaining impacts would be on three breeding populations (small population with <10 breeding pairs). Functional land will not be impacted, and noise and disturbance impacts can be mitigated through mitigation measures. This would require an AA.									
		Consultation with NE regarding mitigation for impacts on the SSSI would be required during project planning. Construction of									
		the scheme assets, including the pipeline new pumping station, will have temporary 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.									
		Negligible effects are anticipated during operation.									
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services	The potentially impacted designated sites would be of medium sensitivity to the temporary, medium-term construction work associated with construction of the pipeline. Scheme may have minor, temporary adverse effects on ecosystem services	Medium	Moderate	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial	
	from natural capital that contribute to the economy.	during pipeline construction.					,	,			
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	Medium	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial	
		construction waste. There is no risk of spreading aquatic INNS through the raw water transfer as the water is treated.					()				
Population and human	2.1 To protect and improve health and well-	Potential adverse effects on nearby residential areas through noise/vibration, dust emissions, HGV movement impacts	Large	Moderate	Long-term	Temporary	Low (adverse)	Medium (adverse)	Minor adverse	Minor beneficial	
riediui	economic development through provision of	areas located in proximity to the proposed pipeline route.					Low (beneficial)	Medidin (benencial)			
	access to a resilient, high quality, sustainable and affordable supply of water	The scheme would deliver 2MI/d helping to maintain essential public water supplies and therefore help maintain public health and well-being. Therefore, minor beneficial effects are anticipated.									
	over the long term.	Advarse affects anticipated during operation would be pagligible and limited to vehicle movements required for routine									
		maintenance.									
Population and human health	2.2 To protect and enhance the water environment for other users, including	The scheme would only cause temporary disruption to public right of ways, river crossings, footpaths and access routes nearby the construction. These effects will be mitigated as far as possible, such as by footpath diversions and liaison between	Large	High	Long-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial	
	recreation, tourism and navigation.	Yorkshire Water, local councils and the Highways Agency.					,	,			
		environment for other users.									
Material assets and	3.1 To reduce, and make more efficient, the	The scheme will not help reduce water demand, nor will it support the use of sustainable/renewable energy.	Medium	High	Medium-term	Permanent	Medium (adverse)	Medium (adverse)	Moderate adverse	Negligible beneficial	
resource use	domestic, industrial and commercial consumption of resources, minimise the	Scheme construction will require some use of materials at a scale consistent with the size of the scheme (new pipeline). Given the size of the scheme, the magnitude of effect is medium.					Low (beneficial)	Low (beneficial)			
	generation of waste, encourage its re-use and eliminate waste sent to landfill	Once operational, minimal material inputs will be required, other than for regular maintenance but some minor additional resources will be needed for nower for numping									
		The scheme will make use of existing water infrastructure.									
Water	4.1 To maintain or improve the quality of	As the existing licence from which the abstraction would be made is subject to review under the WINEP in AMP7, the WFD assessment indicated that the scheme is uncertain with respect the WED compliance. However, the impact of the increased	Medium	Low	Medium-term	Temporary	Low (adverse)	Medium (adverse)	Minor adverse	Negligible beneficial	
	coastal waterbodies	2MI/d abstraction in isolation is likely to be minor.					Low (bononoidi)	Low (bolicitoidi)			
		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. Best practice construction techniques and appropriate mitigation measures such as controlling									
		surface water runoff and dust emissions from construction sites would render the adverse effects no more than minor.									
Water	4.2 To avoid adverse impact on surface and	As the existing licence from which the abstraction would be made is subject to review under the WINEP in AMP7, the WFD	Small	Low	Medium-term	Temporary	Low (adverse)	Medium (adverse)	Minor adverse	Negligible beneficial	
	groundwater levels and flows, and ensure sustainable management of abstractions.	assessment indicated that the scheme is uncertain with respect the WFD compliance. However, the impact of the increased 2MI/d abstraction in isolation is likely to be minor.					Low (beneficial)	Low (beneficial)			
		The construction of the pipeline has potential to have adverse effects on water flows and levels in a number of streams and break as a result of changes to design a design of facts are articipated assuming best profiles construction									
		techniques and appropriate mitigation measures, including pipe-jacking and controlling surface water runoff flows.									
Water	4.3 To reduce and manage flood risk.	Sections of the pipeline would be located within Flood Risk Zones 2 or 3. Temporary mitigation measures may be required to	Small	High	Medium-term	Temporary	Low (adverse)	Medium (adverse)	Minor adverse	Negligible beneficial	
		alleviate flood risk during construction, including provision of flood compensation. However, the pipeline would be below		-9		,	Low (beneficial)	Low (beneficial)			
		Operation of the scheme is not likely to affect flood risk.									
Water	4.4 To increase awareness 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	
1	sustainability and efficient use of water.										
L	1	1	1	1	1	1	1	1	1		

SE	A topics and objectives		Assessment of option							
Торіс	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 would not affect any sites designated for geological interest. The potential effects on soil associated with the construction work (pipeline trenching/tunnelling) are considered large scale, temporary and reversible. The scheme would predominantly lie on Agricultural Land Classification 3 which is medium value. As such, the adverse effects on land-use would be minor. During operation the pipeline would be buried. Therefore, negligible effects anticipated during operation of the scheme.	Large	High	Medium-term	Temporary	Medium (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial
Air and climate	6.1 To maintain and improve air quality.	The Malton A ⁻ MA is located within 3km of the scheme proposed pipeline. Construction and vehicle movements associated with the construction phase would generate emissions and dust in the long-term. These will be minimised through best practice construction techniques. The increase in vehicle movements associated with the construction of the pipeline would be moderate. Air emissions during operation will be negligible and limited to vehicle movements required for routine maintenance checks.	Medium	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.	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 2MI/d of supply.	Medium	High	Medium-term	Permanent	Medium (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 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 (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial
Archaeology and cultura heritage	I 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 and one scheduled monument. 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 (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 Howardian Hills AONB is located within 3km of the proposed pipeline route. The construction of the pipeline would have temporary effects on the landscape setting of the AONB and other non-designated landscape areas, these would be medium- term and temporary.	Medium	High	Medium-term	Temporary	Low (adverse) Low (beneficial)	Medium (adverse) Low (beneficial)	Minor adverse	Negligible beneficial

Part	1 of 2
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ocheme name	Ros North Torkshile Groundwater 2										
Scheme description	This option involves increasing the permitted abstraction volume for an existing borehole licence in North Yorkshire. The option would involve abstraction from the Corallian Group, specifically the Malton Oolite Formation and the Lower Calcareous Grit formation, with an increase in the average daily abstraction from 2.49MI/d to 4.49MI/d.										
SEA t	opics and objectives					Asses	ssment of option				
Торіс	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.	A HRA assessment was undertaken for potential effects towards the River Derwent SAC. The River Derwent SAC is approximately 3km from the proposed abstraction point and construction works to commission the new borehole are required but are likely to be minor. With respect to the operation of this option, HRA screening has been undertaken	. Small	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.	Minor works to commission new borehole and to provide a washout to local drainage system are likely to be required, plus UV disinfection subject to water quality characteristics. Adverse impacts are likely to be minimal during operation on natural capital.	Low	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.	Minor construction works are required, though there is a negligible risk of introducing INNS through construction activities should standard biosecurity measures be implemented. There is no risk of introducing INNS during the operation stage.	n/a	n/a	n/a	n/a	n/a	n/a	Negligible Adverse	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.	An increase of 2 Mil/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.	Low	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 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, 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. 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 utilise existing infrastructure.	, Small	moderate	Long-term	Permanent	Low (adverse) Low (beneficial)	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	WFD assessment indicated no adverse effects towards the river water quality at low flows due to the potential impact of a minor reduction in baseflow from the Derwent (south) Mercia Mudstone, Lias, Ravenscar and Norton Corallian aquifer, as a result of the increased abstraction.	s 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.	A negligible impact is anticipated on baseflow to the Derwent (south) Mercia Mudstone, Lias, Ravenscar and Norton Corallian aquifer (GB40402G70220) as a result of the increased abstraction.	Small	Low	long-term	Permanent	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible Adverse	Negligible beneficial	
Water	4.3 To reduce and manage flood risk.	In operation the abstraction would have a negligible impact 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 affect 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.	There is no additional land take or excavations associated with the scheme, therefore no impacts are anticipated.	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 scheme is located within 3km of the Malton A ⁻ MA. There is minor construction works associated with the scheme. It is not anticipated that there will be any impacts on air pollutant emissions during the operation of the scheme.	s n/a	n/a	n/a	n/a	n/a	n/a	Negligible Adverse	Negligible beneficial	
SEA topics and objectives		Assessment of option									
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Торіс	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.	Operation of the scheme will require a very small amount of additional energy consumption associated with increased groundwater pumping and additional water treatment chemical use, with a negligible adverse impact on greenhouse gas emissions.	Low	Moderate	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 (2Ml/d) contribution to securing a supply-demand balance over the next 25 years taking account of climate change risks and uncertainties.	Low	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 or designated assets within proximity to the scheme. The local area is crossed by the route of a Roman Road but as there is no construction required for this scheme, there is no risk of disturbing unknown buried assets. There are no known water dependent heritage assets that might be affected by the potential small reduction in baseflow due to the abstraction.	n/a	n/a	n/a	n/a	n/a	n/a	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 designated landscapes within 3km of the scheme. Operation of the scheme is assessed as having no greater than a negligible impact on landscape and visual amenity arising from the potential small reduction in baseflow due to the abstraction and construction activities will take place within an existing borehole site.	e n/a	n/a	n/a	n/a	n/a	n/a	Negligible Adverse	Negligible beneficial	

Option Name	R72 River Wharfe Licence Increase										
Option Description	The option involves an increase in the licence volume from the River Wharfe. This option will not change the daily licence limits. The benefit of the option will depend on when permission is granted, as it is related to the number of days left in the licensing year.										
SE	SEA topics and objectives Assessment of option										
Торіс	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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and consider adaptability to climate change.	The impact to East Keswick Fitts SSSI (a meandering section of the River Wharfe providing valuable invertebrate habitat) has been assessed as negligible. The option has been assessed as having a negligible impact on river flow and level. The option is assessed as having a negligible impact on the NERC species and notable species: brown trout, Atlantic salmon, white clawed crayfish, otter and water vole. The risk of deterioration of WFD status regarding invertebrates has been assessed as negligible.	Large	Low	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 implementation of the option will lead to a negligible reduction in flow and level, and therefore natural capital and ecosystem services will not be impacted	l. Large	Low	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.	Invasive species utilise flow of the watercourse for dispersal. The implementation of the option will lead to a negligible reduction in flow, and is therefore not anticipated to increase the spread of aquatic invasive non-native species.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial	
Population and human health	2.1 To protect and improve health and well- being and reduce inequalities.	The option would help to maintain essential public water supplies during drought conditions, and therefore help maintain public health and well-being.	Large	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Negligible adverse	Minor beneficial	
Population and human health	2.2 To protect and enhance opportunities for formal and informal recreation.	The option would only cause a negligible reduction in flow, therefore recreational activities such as angling will not be impacted.	Large	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, encourage its re-use and eliminate waste sent to landfill.	No impacts on material assets are anticipated. The option involves relatively minor modifications to abstraction volumes only and no significant changes to energy use, generated waster or sustainable designs are envisaged. The option will make use of existing infrastructure.	Large	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	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.	Water quality throughout the study area is assessed as negligible risk of deteriorating.	Large	Moderate	Short-term	Temporary	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, including when this impacts on habitats and/or navigation.	The option is assessed as havng a negligible impact on river flow. In the River Wharfe between the intake and the tidal limit, the reduction in daily average flows (assessed as up to 23.6MU and would be confirmed at time of application) at moderate river flow conditions is no greater than a 5% effect, at high flows this is considerably less and there would be no impact on low flows. The drought permit would be implemented for a duration of up to 3 months during the period January to March.	S Large	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial	

SEA	A topics and objectives		Assessment of option								
Торіс	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 ensure appropriate and sustainable management of abstractions (or compensation llow) to maintain water supplies whilst protecting ecosystem functions that rely on water resources.	The option would contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. The option will be accompanied by water conservation campaigns to promote efficient use of water to protect the environment and safeguard supplies.	Large	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial	
Water	4.4 To reduce and manage flood risk.	No new assets will be constructed in the flood plain and the abstraction would have a negligible impact on flood flows.	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 the quality and quantity of soils and to protect and enhance geodiversity.	There are no land use changes associated with the implementation of the option. It is anticipated that there will be no impacts on geologically sensitive sites.	Large	Moderate	Short-term	Temporary	N/A	N/A	Negligible adverse	Negligible beneficial	
Air and Climate	6.1 To maintain and improve air quality.	The option involves minor modifications to abstraction volumes and would therefore not result in any significant increases in emissions to atmosphere.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial	
Air and climate	6.2 To reduce greenhouse gas emissions.	The increase in abstraction volumes would be associated with a negligible change in energy use and therefore no significant increases in greenhouse gas emissions are envisaged. The use of existing infrastructure will minimise increases in greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial	
Air and climate	6.3 To consider the need for adaptive measures for climate change.	This option will ensure resilience of water supplies during periods of drought, which may become more prevalent due to climate change.	Large	Moderate	Short-term	Temporary	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.	Nearby ancient monuments and heritage sites are not water-dependent, and would not be impacted by the option.	N/A	N/A	N/A	N/A	N/A	N/A	Negligible adverse	Negligible beneficial	
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	The option would result in a negligible reduction in the level of the River Wharfe, which will have a negligible visual impact on the Nidderdale AONB. However, there is limited access to the impacted reach with no national trails.	Large	Moderate	Short-term	Temporary	Low (adverse) Low (beneficial)	Low (adverse) Low (beneficial)	Negligible adverse	Negligible beneficial	





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