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# Strategic Environmental Assessment of Yorkshire Water's Final Water Resource Management plan

## Post Adoption Statement

Report for Yorkshire Water

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SEA of the WRMP: Post Adoption Statement

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# 1 Introduction

## 1.1 Background to the WRMP

Every five years water companies in England and Wales are required to produce a Water Resources Management Plan (WRMP). The WRMP sets out how water companies aim to balance the supply and demand for water over the next 25 years in a cost-effective manner, managing future demand for water and ensuring resilient and sustainable water supplies. It consists of several elements, including:

- A 25-year demand forecast describing how much water customers will need in the future, considering factors such as changing behaviours and population growth;
- A 25-year supply forecast describing how much water is available for use now and how this may change in the future, considering the impacts of climate change and potential sustainability reductions;
- An assessment of the options to manage the demand for water, including installing water meters at customers' properties, helping customers to be more water-efficient, and reducing leakage;
- An assessment of the options for providing additional reliable supplies of water, including water abstraction, water transfers and desalination.

The Yorkshire Water draft Water Resources Management Plan (dWRMP) was published for consultation in Spring 2018, accompanied by the Strategic Environmental Assessment (SEA) Environmental Report. Comments relating to the Environmental Report and the SEA process, and the actions taken by Yorkshire Water in response to the consultation, were recorded in the Statement of Response, published in September 2018, accessible at https://www.yorkshirewater.com/resources/. Following this, a revised draft Water Resources Management Plan (rdWRMP) was published in September 2018 and the Environmental Report was also updated to align with the rdWRMP. Yorkshire Water have since made further changes to the WRMP2019 to adjust the implementation of its future leakage activity and to include a proposal to increase a river abstraction licence that will provide addition winter resilience, and the SEA was updated accordingly. The Final WRMP2019 was published in April 2020.

## 1.2 The SEA Process

The WRMP has been subject to SEA in compliance with the SEA Directive, as transposed in England by the SEA Regulations. This SEA Post Adoption Statement is produced in accordance with the provisions of Regulation 16 of the SEA Regulations.

The SEA process for Yorkshire Water's WRMP started in 2017 and ran in parallel with the development of the WRMP. An Environmental Report was produced with the dWRMP and was further updated to accompany the rdWRMP. Habitats Regulations Assessment (HRA) screening of the WRMP was also undertaken and helped to inform the SEA process. Following Defra's review of the rdWRMP in February 2019, some further amendments were made to the WRMP prior to final publication in April 2020, with the SEA informing the finalisation of the preferred programme of measures in the WRMP. Following approval of the WRMP2019 for publication by the Secretary of State, this SEA Post-Adoption Statement is being issued to accompany the published plan.

### 1.2.1 Purpose of the SEA Post Adoption Statement

This SEA Post Adoption Statement is produced in accordance with the provisions of Part 4 of the SEA Regulations (see **Appendix A**). In accordance with Regulation 16 of the SEA Regulations, this SEA Post Adoption Statement describes:

- How environmental considerations have been integrated into the Final WRMP (Section 2)
- How the Environmental Report has been taken into account (Section 3)
- How responses to consultation have been taken into account (Section 4)
- Reasons for choosing the Final WRMP as adopted, and why other reasonable alternatives were rejected (Section 5)
- The measures that are to be taken to monitor the significant environmental effects of implementation of the Final WRMP (Section 6).

# 2 How Environmental Considerations have been integrated into the WRMP

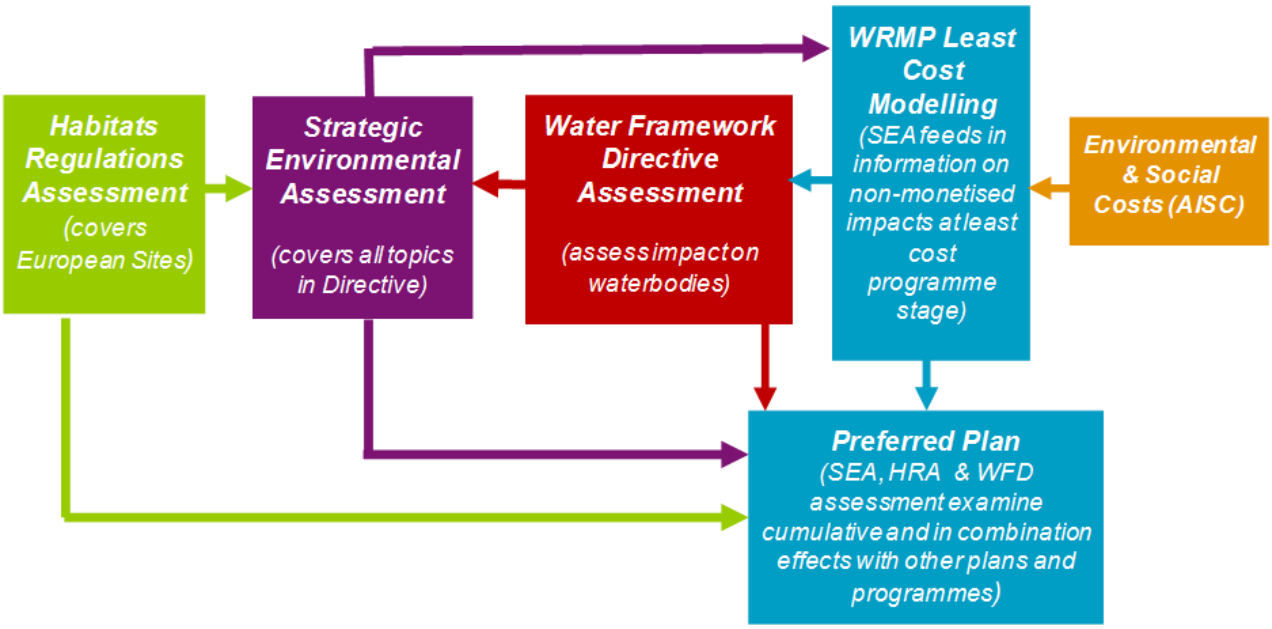
WRMPs are developed to ensure a reliable, secure water supply over a 25-year planning period and that the measures proposed to maintain the balance between supply and demand for water provide value for money to Yorkshire Water's customers, whilst taking account of environmental and social effects. Environmental requirements are considered in the calculation of available water supply, including incorporation of climate change scenario predictions.

Environmental considerations were incorporated into the development of Yorkshire Water's WRMP from the outset. The initial 'unconstrained' option list was screened against a range of criteria including environmental impact. A 'constrained' list' of options was arrived at through successive screening stages. The process is explained in more detail in the WRMP.

Those options that were suitable to be taken through to the 'constrained' list were scoped and subject to engineering and environmental appraisal to enable derivation of capital and operating costs, an understanding of environmental and social impacts, assessment against the SEA objectives, and incorporation of appropriate mitigation, for example, by routing pipelines to avoid sensitive habitats. Where environmental and social impacts (both negative and positive) could be monetised, values were ascribed to enable their inclusion in the average incremental social cost (AISC) of each scheme. Using Yorkshire Water's optimisation model according to the Economics of Balancing Supply and Demand (EBSD) methodology, the least cost solution for the Grid Surface Water Zone was identified, based on net present costs. A 'least cost' programme was developed, incorporating consideration of those environmental and social impacts which had been monetised.

**Figure 2.1,** replicated from the final WRMP2019, illustrates how the SEA, Habitats Regulations Assessment (HRA) and Water Framework Directive (WFD) Assessment of the WRMP contributed to the development of Yorkshire Water's WRMP least cost modelling (along with the inclusion of Environmental and Social Costs) and through iteration, led to the identification of the Preferred Programme of measures to balance supply and demand.

Figure 2.1 Integration of SEA, HRA and WFD assessment components into the development of the Yorkshire Water WRMP Preferred Plan. *Source: YW WRMP2019, Figure 9.2*



The SEA was used to review all the environmental and social effects of the least cost programme taking account of those environmental and social effects which had not already been monetised and thereby considered through least cost modelling. This provided a check that the least cost programme did not include schemes that might cause unacceptable or avoidable environmental and social effects, and accords with Stage 13 of the EBSD Guidelines.

HRA Screening was undertaken in parallel with, and informed, the SEA. The screening assessment considered the potential for any likely significant effects (LSEs) on the integrity of European sites arising from schemes included in the feasible options list in the WRMP2019. The HRA found that there were unlikely to be any LSEs on European sites from the WRMP (based on current information and current designations), either alone or in combination with other plans or projects. Natural England and the Environment Agency were extensively consulted as part of the HRA. Additionally, effects on SSSIs arising from potential schemes were assessed in consultation with Natural England.

# 3 How the Environmental Report influenced the WRMP

The Environmental Report and the WRMP were developed in parallel so that the SEA process could inform the development of the WRMP. **Table 3.1** identifies the main findings and outputs of the Environmental Report which informed the development of the WRMP.

Table 3.1 Findings of Environmental Report and their considerations in the WRMP

| Finding/Output | Integration into the WRMP |
|---|---|
| **Schemes and Programme Impacts** | |
| Individual scheme assessments were undertaken. Potential cumulative scheme effects and mutually exclusive schemes were also identified. On the basis of these assessments, informed decisions were made as to which schemes should be considered for inclusion in programmes or excluded. | SEA outputs were integrated into the WRMP as follows:<br>Schemes in the programme selected by least cost modelling were examined to determine whether they had significant environmental and social effects that had not already been taken into account as monetised impacts. Where schemes were found to have greater impacts, they were removed from the scheme pool (feasible list) and the programmes re-modelled (e.g. Scheme R6).<br>The least cost solution for the WRMP was refined taking into consideration the non-monetised environmental effects and other factors, such as customer and stakeholder views and wider risks to scheme development and promotion.<br>The SEA examined the Preferred Solution including consideration of cumulative effects that could arise between the schemes in the Preferred Solution, and between the WRMP and other plans.<br>Specific scheme related recommendations are identified below. |
| Scheme R6 - South Groundwater Option 1. The scheme was identified as having potential to cause moderate adverse effects on groundwater quality in an aquifer unit already assessed as having poor status under the Water Framework Directive.<br>Scheme R12 – East Yorkshire Groundwater Option 1. This scheme was identified as having potential minor adverse effects on multiple SEA objectives. | Schemes R6 and R12 were both selected in the least cost solution. In scheme R6, although abstraction would be in existing licence conditions, there is a risk of potential deterioration between WFD classes. For scheme R12, although the licensed limit is underutilised there is a risk to future abstractions due to potential saline intrusions.<br>Both of these schemes are in WINEP and further investigations would be needed to be carried out to confirm impacts before implementation. They were therefore not included in the preferred plan.<br>The preferred plan for the WRMP was considered to be more robust and sustainable than the least cost solution. |
| The distribution management options were assessed as being unlikely to have any major adverse effects on any of the SEA objectives. Minor adverse effects were found to be associated with potential construction impacts for the following topics; population and human | When selecting the preferred plan, Yorkshire Water reviewed their initial least-cost plan against SEA findings. The preferred plan was also selected in accordance with YW's goal to use distribution management and leakage reduction options as far as possible. The limited |

| Finding/Output | Integration into the WRMP |
|---|---|
| health, material assets and resource use and air and climate. Any adverse effects are likely to be short-term and localised and it is suggested that best practice construction methods will help minimise these. | minor adverse effects associated with the distribution management options and potential for major to minor beneficial effects enabled YW to select these options for their preferred plan with the confidence of having limited to no environmental or social effects. |
| Scheme R13 has moderate adverse effects on SEA objectives involving biodiversity (including natural capital) and groundwater levels. | This option is included in the preferred plan to provide added resilience in addition to the distribution management options. The SEA highlighted that further investigation on this option would be required to determine the extent of any adverse effects to groundwater levels and further design details are required to demonstrate if mitigation measures can avoid impacts on the ancient woodland.<br><br>The WRMP specified further environmental investigations for this option during AMP7 including hydrological impact assessment and WFD assessment before licence application in AMP8. |
| Several schemes were identified as having major adverse effects on the environment (e.g. reservoir desilting, desalination and the Tees to Ouse options). | These schemes were included in the feasible list of options, however, the SEA identified major adverse effects associated with these schemes. YW's preference was to constrain out options classified in the SEA as having major adverse impacts, therefore, these options were not included in the preferred plan.<br><br>YW specified in the WRMP that if these options were selected in the future, YW would consider the wider benefits of the schemes (such as those identified in the SEA) and potential mitigation before constraining out. |
| **Mitigation of the WRMP** | |
| *Effects on population and human health*: many of the schemes could result in minor temporary adverse effects including reduced access and enjoyment of amenity sites and associated recreational pursuits, noise, vibration and dust, and traffic disruption during construction of supply schemes or delivery of leakage and demand management solutions. | Mitigation measures, such as communication of the period of works, careful timing of works and temporary provision of alternative access routes and sites for recreation and access, would help minimise the adverse effects over the construction/delivery period and ensure they do not extend beyond it. |
| *Effects on water and biodiversity, flora and fauna*: A number of schemes could lead to minor adverse effects on groundwater and/or surface water flows either as a result of direct abstraction or flow augmentation. Schemes R13 and R9 could have moderate or minor adverse effects depending on final design, location and timing of the abstractions. | Effects on river flows, groundwater levels, water quality and ecology will need to be considered in more detail to inform potential mitigation requirements. This is pertinent to Schemes R9 and R13. Mitigation may involve careful siting of new boreholes, identification of optimal pumping regimes relative to groundwater levels or river flows, and careful routing of new pipelines. |
| *Effects on archaeology and cultural heritage effects*: Any adverse effects would need to be investigated in close cooperation with Historic | Mitigation through careful design and pipeline routing plus a watching brief to oversee construction works and ensure appropriate precautions are taken to protect buried assets. |

| Finding/Output | Integration into the WRMP |
|---|---|
| England, county archaeological services and other interested stakeholders. | Mitigation may include preserving in-situ, and where impracticable, opportunities to preserve assets ex-situ should be investigated. |
| *Material assets and resource use*: some of the schemes have mixed effects (D1, D4, D5, D6, D7, D8, D10, D11). Minor adverse effects are associated with the requirement of materials and minor to moderate beneficial effects are provided through reduced water demand. | Mitigation measures including sustainable procurement policies and energy conservation measures, plus efficient use of materials during construction. |
| *Soils, geology and land use*: all schemes in the preferred plan were assessed as having negligible effects on soil, geology and land use. | Mitigation measures principally comprise soil erosion control precautions during construction and best practice land re-instatement techniques following construction. |
| *Effects on air quality and greenhouse gas emissions:* many of the schemes were identified as resulting in minor adverse effects associated with construction works, operational vehicle movements and operational energy use. | Where adverse effects are associated with air quality and emissions to sensitive areas (e.g. AQMA designations), mitigation measures such as vehicle emission control, effective logistical organisation and selection of appropriate vehicle routes to minimise the potential effects can be implemented. Green energy procurement and green transport fleet activities can also mitigate the adverse effects. |
| *Effects on landscape and visual amenity*: Scheme D1 (Active leakage control: increased find and fix) has the potential for minor adverse effects associated with the renewal/repair of supply pipes. | Mitigation comprises sensitive design of permanent above ground assets and screening where necessary of construction works near residential properties. |

# 4 Consultation and Updates

## 4.1 Consultation on the SEA

The SEA process comprised several consultation stages, as follows:

- An SEA Scoping Report was issued on 30 May 2017 to statutory consultees and opinions were sought on the proposed scope and level of detail proposed for the SEA until 4 July 2017.
- The SEA Environmental Report was published with the dWRMP on Yorkshire Water's website in March 2018 for an eight-week period, for both statutory and public consultation. A draft HRA Screening Report and the non-technical summary were published at the same time.
- A Statement of Response (SoR), including responses to comments on the SEA Environmental Report and the HRA Screening Report, was published on Yorkshire Water's website in September 2018.
- The SEA Environmental Report was updated in response to the comments made in the consultation period and published along with the rdWRMP on Yorkshire Water's website in September 2018.
- Following the publication of the SoR, Yorkshire Water received a request from Defra for further information in support of the plan, in a letter dated 8 February 2019. This specially contained information relating to the SEA Non-technical Summary. This letter, along with a response from Yorkshire Water dated 27 March 2019, were uploaded alongside the SoR on the Yorkshire Water website and relevant consultees were also informed.
- The SEA Environmental Report and SEA Post Adoption Statement were published with the Final WRMP on Yorkshire Water's website in April 2020.

Changes to the WRMP made as a result of consultation are described in the SoR and changes to the SEA made as a result of consultation are summarised in **Section 4.2**.

## 4.2 Consultation Responses

**Table 4.1, 4.2 and 4.3** list a summary of the representations that relate to the SEA and the resulting changes as set out in the SoR and subsequent revision of the SEA Environmental Report in September 2018.

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Table 4.1 Extract from Statement of Response: Summary of draft WRMP Environment Agency representations relating to the SEA and changes made

| Issue | Comment | Implications | Changes Required | YW Response |
|---|---|---|---|---|
| I 4.1 Non-Technical Summary (NTS) | The Non-Technical Summary (NTS) provided fails some of the criteria set out in the relevant Regulations, specifically Schedule 2, paragraph 10 which requires the NTS to include information as set out in Paragraphs 1 to 9.<br><br>Information on Paragraphs 2, 3 and 7 is not provided and is weak for Paragraphs 4, 6 and 9.<br><br>Addition of a location plan would aid understanding of the scope of the SEA.<br>The NTS is very high level and provides no information on the demand- or supply-side options being considered or their environmental effects. | The NTS is not compliant with the requirements of the Environmental Assessment of Plans and Programmes Regulations 2004. | The company should revise its NTS in line with the requirements of the Environmental Assessment of Plans and Programmes Regulations 2004.<br><br>A summary table of demand- or supply-side options and their environmental effects should be provided. | The NTS has been expanded to provide more detailed information relating to Paragraphs 2, 3, 4, 6, 7 and 9 of the Environmental Assessment of Plans and Programmes Regulations 2004. A figure displaying the assessment study area with the approximate location of schemes and a table that summarise the environmental effects of schemes in the plan have been added. |
| I 4.2 Baseline environmental information | The current state of the environment and evolution data is only provided for Sites of Special Scientific Interest (SSSIs).<br><br>Future evolution of the environment in the absence of the plan is largely not discussed.<br><br>Although 'key issues' are clearly identified, these do not relate specifically to future evolution.<br><br>Section 4 notes difficulties inherent in attempting to predict | The water resource management plan will remain non-compliant with the Regulations if comment is not provided on the "likely evolution thereof without implementation of the plan or programme". | The company should include in Section 4.2 a statement on the lack of certainty about future evolution for all receptors except SSSIs (for which future status data was available from Natural England, NE) and that, in accordance with NE's consultation response, this linked to the 'certainty' column of the assessment framework table.<br><br>The company should include additional comment on future development in the absence of the plan. | It should be recognised that WRMP options for implementation beyond 2025 will be further assessed by Yorkshire Water through the next statutory WRMP. Due to be published in 2024; this plan will also be subject to SEA. This process is currently repeated every five years, and it is assumed this will continue into the future. This regular statutory update and review will ensure that actual changes to the baseline and updated forward projections can be considered in subsequent WRMPs and |

| Issue | Comment | Implications | Changes Required | YW Response |
|---|---|---|---|---|
| | the evolution of the environmental baseline over the very long timescales required for a water resource management plan. | | It may be possible to include lessons learnt from the preceding (2014) WRMP to inform at least some of the environmental baseline covered in this water resource management plan. | SEAs. Sections 4.3 and 4.4 of the SEA Environmental Report have been amended to provide further clarity on this issue. |
| I 4.3 Existing environmental problems should be identified and used to inform the SEA objectives and assessment. | The water resource management plan states that Habitats Risk Assessment (HRA) screening has been carried out and summary conclusions are provided in a number of Options Assessment matrices in Appendix E of the plan.<br><br>It is not stated if the water resource management plan has been screened against the Birds Directive though Special Protection Areas are identified in Appendix D tables and figures. | Presentation of summary conclusions is appropriate for a SEA, but the results are deeply buried. | The company should bring these HRA screening results together into a short section or summary table in the main report. | A section has been added to the SEA Environmental Report that summarises the outcomes of the HRA Screening. Section 1.4 has been updated to clarify that the HRA included the consideration of Special Protection Areas designated under the Birds Directive. |
| I 4.4 Eels | No evidence is provided within the plan to describe the eels work (either past work meaning no further work needed or new works planned). There also appears to be no reference to eels in the SEA report (though there is mention of associated regulations in the SEA Appendices). | It is unclear how the plan will ensure compliance with the Eel Regulations. | The company should provide in the plan detail of past, current and planned future works to demonstrate actions to comply with Eel Regulations are being taken. | The Eels (England and Wales) Regulations 2009 are cited in Appendix C of the SEA. Appendix D provides an overview of the environmental baseline, which includes consideration of eels. As described in Section 4.6 of the Environmental Report, key issues arising from the review of baseline conditions for each of the SEA topics are summarised in Table 4.1. These key issues have been used to support the |

| Issue | Comment | Implications | Changes Required | YW Response |
|---|---|---|---|---|
| | | | | development of the SEA objectives in Section 5 and resultant assessment of all options. All options have been assessed to the same level of detail, in line with the SEA legislative requirements, national SEA guidance and the UKWIR SEA guidance. The level of detail for the environmental assessment of each option is consistent with the strategic nature of SEA. This is a high-level, strategic assessment, carried out without the detailed information which would be support an EIA. However, to address the comment that Yorkshire Water should provide detail of past, current and planned future works to demonstrate actions to comply with Eel Regulations are being taken, additional information is provided in SEA Appendix D, Section 1.1.2. |
| I 4.5 Local wildlife sites | It is not clear whether the company has fully taken on board comments from Natural England about inclusion of local wildlife sites as well as formally designated sites. | The company's assessment of options may not include locally significant wildlife sites and potential impacts upon them. | The company should update figures D1 and D2 with local wildlife sites (in its supporting document) and demonstrate it has considered local wildlife sites in the plan. | LWS in proximity to the options were identified, subject to availability of suitable data-sets. However, gathering of detailed information and the assessment of effects on Local Wildlife sites is outside the scope of SEA. LWSs would be considered during the implementation phase of schemes at the project level. Obtaining information on all LWSs for the WRMP is not considered reasonable given the significant time and costs |

| Issue | Comment | Implications | Changes Required | YW Response |
|---|---|---|---|---|
| | | | | associated with acquiring the data. Screening of LWSs was undertaken for the Drought Plan as it was feasible to gather the required data set. Going forward, Yorkshire Water acknowledge the importance of LWSs and is undertaking work to ensure that their plans and operations do not adversely affect LWSs. |

Table 4.2 Extract from Statement of Response: Summary of draft WRMP Natural England representations relating to the SEA and changes made

| Comment | Response |
|---|---|
| Strategic Environmental Assessment:<br><br>The SEAs five-year temporal scope does not comply with the regulations long term requirement | Section 4.3 in the Environmental Report has been updated to clarify that the temporal scope of the SEA is aligned with the 25-year duration of the WRMP. |
| Enhancing Resilience:<br><br>The plan (dWRMP) could be much improved by giving greater consideration to opportunities in the natural environment to help secure resilient water supplies, such as integrated catchment solutions, alongside its traditional asset and infrastructure based options to increase water supply. The natural environment has a major role in the provision and regulation of water resources (both quality and quantity). | For PR19 we have developed a resilience framework to assess the maturity of our resilience in all parts of the business, including land management and water supply systems. The process and findings of this has been published in our report 'Water resilience in Yorkshire' alongside our PR19 business plan. Details of this resilience planning are included in section 3.8 of the revised plan. Section 3.8.9 gives specific details of our approach to resilient catchment management to protect Yorkshire's raw water and biodiversity. |
| Natural Capital and Ecosystem Services: It is recommended the dWRMP could be much improved in its approach to enhance natural capital and improve ecosystem services. For example, protecting raw water quality is still the major role water companies can play and do more around this, creating a direct benefit to the WRMP and water supple because of reduced need for treatment/blending etc. | The Environment Agency's Environmental Valuation in Water Resources Planning – Additional Information (2016) recommends the use of risk-based approach to assessment of environmental and social impacts of the plans. For environmental impacts, the Environment Agency encourages the use of the ecosystem services approach as a first step in assessing the water resource management plans (although it also presents alternative appraisal methodologies). For the draft WRMP19, we identified environmental impacts using the ecosystem services approach and were further informed by the results of the Strategic Environmental Assessment. |

Table 4.3 Extract from Statement of Response: Summary of draft WRMP Hull City Council representations relating to the SEA and changes made

| Comment | Response |
|---|---|
| Finally, the last point has been further brought into focus by the publication of the Environment Agency "State of the Environment: Water Resources" Report on the 23rd May. While this has been published at the end of the consultation period it would be beneficial if Yorkshire Water could identify, in response to the consultation questions, how it is/will respond to the issues raised in the Report. | The Environment Agency "State of the Environment: Water Resources" Report has been reviewed and added to Table C1 in Appendix C of the SEA. |

Following publication of the SoR, rdWRMP in September 2018, and subsequent revision of the SEA Environmental Report, Yorkshire Water received further comments from Defra in a letter dated 8 February 2019. This letter contained a request for further updates to the SEA Non-technical summary in order to meet compliance, further details are provided below in **Table 4.4**.

Table 4.4 Extracted from letter from Defra (dated 8 February 2019) and a response letter from Yorkshire Water (dated 27 March 2019)

| Defra Comment | YW Response |
|---|---|
| **Update to the SEA non-technical summary to make it compliant:**<br><br>There are a number of changes needed to the non-technical summary to make the Strategic Environmental Assessment (SEA) compliant. This includes updating the environmental baseline section, stating whether any significant effects (adverse or beneficial) are expected as a result of the preferred plan and including a summary of the mitigation measures. The non-technical summary should be a standalone document and allow the reader to understand the mitigation measures envisaged. | We have liaised with the Environment Agency to understand in more detail those areas of the SEA non-technical summary that may have been viewed as non-compliant, and we have updated the non-technical summary accordingly. A copy of our revised non-technical summary is appended to this letter. In the revised non-technical summary, please note that the yellow highlighted text is from the last update (as per our revised draft WRMP submission); further updates, in response to your letter of 8 February and after discussion with the Environment Agency, are shown highlighted in blue.<br><br>I trust that this letter addresses the issues raised in your letter. Please do not hesitate to contact me should you require any further information. I can confirm that this letter, together with a copy of your letter of 8 February, will be uploaded to our website alongside our previous Statement of Response, and also that relevant consultees will also be informed. |

# 5 Rationale for selection of the Water Resources Management Plan

## 5.1 Scheme level alternatives

All the options in the Feasible List, including both demand and supply options, were subject to assessment against the developed SEA framework. In this way, viable alternatives were assessed at the scheme level. This assessment informed the assessment of alternative programmes, and the assessment of potential cumulative effects between schemes.

## 5.2 Programme level alternatives

Programme appraisal commenced with the generation of a least cost solution to address the forecast supply-demand deficit over the 25-year planning horizon using an optimisation model. The costs considered by the model are capital costs (capex) and operating costs (opex). In addition, certain environmental and social effects are monetised using an ecosystem services approach, and these are included in the costs input to the model.

Programme appraisal is the process by which the least cost solution is refined to create the Preferred Programme solution. The process takes account of the environmental and social effects of each scheme identified by the SEA, as well as other factors, such as government policy, customer preferences, stakeholder considerations and wider risk factors. Only those environmental effects which have not been monetised are taken into account in programme appraisal, in order to avoid double counting of effects.

**Table 5.1** provides a summary of the SEA outputs relating to the least cost solution relating to the final revised supply-demand forecast. The majority of impacts associated with the selected schemes were assessed as negligible, but there are several minor adverse and minor beneficial effects. There is one scheme that has a moderate adverse effect in relation to one SEA objective.(R6 South Yorkshire Groundwater Option 1).

In selecting its preferred solution for the WRMP, Yorkshire Water sought to provide a solution that minimised environmental and social risks, met customer and regulatory preferences and was flexible and sustainable in an uncertain future. Both Ofwat and the UK Infrastructure have stressed the importance of leakage reduction as a priority, a challenge which resonated strongly with Yorkshire Water customers. Therefore, Yorkshire Water's preferred solution is to reduce leakage by 40% by AMP9.

The resulting preferred solution is largely distribution management led with a further two resource management options for resilience. The demand reduction options meet Yorkshire Water's customers' aspirations and business objectives to reduce leakage by 40% by AMP9. The additional supply side solutions are included to provide additional resilience and further adaptability and will not be required to meet any future supply-demand deficit.

The main difference between the least cost and preferred solution (**Table 5.2**) is the emphasis now placed on leakage reduction activity, highlighting Yorkshire Water's long term ambition to avoid reliance on increased abstraction to meet future deficit. Furthermore, R6 South Yorkshire Groundwater Option 1 and the R12 East Yorkshire Groundwater Option 1 have been omitted from the preferred plan. These were not included in the preferred plan as they are both in WINEP and further investigations are required to give Yorkshire Water confidence that they could be implemented. Instead, schemes R9 North Yorkshire Groundwater Option and R13 East Yorkshire Groundwater Option 2 were included in the preferred solution.

## Table 5.1 SEA of the Yorkshire Water WRMP2019 Least Cost Solution

| Scheme Ref. | Scheme Name | | SEA Objective | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Biodiversity, flora and fauna | | | Population and human health | | Material assets and resource use | Water | | | | Soil, geology and land use | Air and climate | | | Archaeology and cultural heritage | Landscape and visual amenity |
| | | | 1.1 | 1.2 | 1.3 | 2.1 | 2.2 | 3.1 | 4.1 | 4.2 | 4.3 | 4.4 | 5.1 | 6.1 | 6.2 | 6.3 | 7.1 | 8.1 |
| C6a | Commercial water user audit and retrofit | Adverse | | | | | | | | | | | | | | | | |
| | | Beneficial | | | | | | | | | | | | | | | | |
| D8a-b | Satellite Technology | Adverse | | | | | | | | | | | | | | | | |
| | | Beneficial | | | | | | | | | | | | | | | | |
| D10a-b | Smart Networks | Adverse | | | | | | | | | | | | | | | | |
| | | Beneficial | | | | | | | | | | | | | | | | |
| R6 | South Yorkshire Groundwater Option | Adverse | | | | | | | | | | | | | | | | |
| | | Beneficial | | | | | | | | | | | | | | | | |
| R12 | East Yorkshire Groundwater Option 1 | Adverse | | | | | | | | | | | | | | | | |
| | | Beneficial | | | | | | | | | | | | | | | | |

**Key:**

- Major adverse
- Moderate adverse
- Minor adverse
- Negligible adverse
- Major beneficial
- Moderate beneficial
- Minor beneficial
- Negligible beneficial

## Table 5.2 SEA of the Yorkshire Water WRMP2019 Preferred Plan

| Option | Impact | SEA objective | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.1 | 1.2 | 1.3 | 2.1 | 2.2 | 3.1 | 4.1 | 4.2 | 4.3 | 4.4 | 5.1 | 6.1 | 6.2 | 6.3 | 7.1 | 8.1 |
| D1 Active leakage control: increased find and fix | Adverse | | | | | | | | | | | | | | | | |
| | Beneficial | | | | | | | | | | | | | | | | |
| D4 Customerside | Adverse | | | | | | | | | | | | | | | | |
| | Beneficial | | | | | | | | | | | | | | | | |
| D5 Trunk main metering | Adverse | | | | | | | | | | | | | | | | |
| | Beneficial | | | | | | | | | | | | | | | | |
| D6 DMA engineering & pressure management | Adverse | | | | | | | | | | | | | | | | |
| | Beneficial | | | | | | | | | | | | | | | | |
| D7 Acoustic logging | Adverse | | | | | | | | | | | | | | | | |
| | Beneficial | | | | | | | | | | | | | | | | |
| D8 Satellite technology | Adverse | | | | | | | | | | | | | | | | |
| | Beneficial | | | | | | | | | | | | | | | | |
| D10 Smart networks | Adverse | | | | | | | | | | | | | | | | |
| | Beneficial | | | | | | | | | | | | | | | | |
| D11 Service pipe renewal | Adverse | | | | | | | | | | | | | | | | |
| | Beneficial | | | | | | | | | | | | | | | | |
| R9 North Yorkshire Groundwater Option | Adverse | | | | | | | | | | | | | | | | |
| | Beneficial | | | | | | | | | | | | | | | | |
| R13 East Yorkshire Groundwater Option 2 | Adverse | | | | | | | | | | | | | | | | |
| | Beneficial | | | | | | | | | | | | | | | | |

**Key:**

- Major adverse
- Moderate adverse
- Minor adverse
- Negligible adverse
- Major beneficial
- Moderate beneficial
- Minor beneficial
- Negligible beneficial

R9 North Yorkshire Groundwater Option was selected to provide security to a local area where current sources are adequate to meet current and future demand but there is uncertainty over potential housing development in the area, it was also identified as a low cost solution. The assessment for this scheme indicated minor adverse effects on a SSSI as a result of reduced baseflow. Consultation with Natural England regarding mitigation for potential impacts would be required before implementation.

R13 East Yorkshire Groundwater Option 2 was selected as an improved location to an existing licensed abstraction that was closed due to bacterial contamination. This scheme features a number of moderate adverse impacts on biodiversity and groundwater SEA objectives. It is suggested that further investigation on this option including further design details and method statement will enable the extent of any adverse impacts to groundwater levels and ancient woodland to be determined. Furthermore, the WRMP has specified further environmental investigations for this option during AMP7 before implementation.

As described in Section 2, the HRA, which included assessment of options R9 and R13, and an Stage 2 Appropriate Assessment for R9, found that there were unlikely to be any likely significant effects on European sites from the WRMP (based on current information and current designations), either alone or in combination with other plans or projects. Natural England and the Environment Agency were extensively consulted as part of the HRA.

# 6 Mitigation and Monitoring of the WRMP

## 6.1 Overview

Consideration of mitigation measures and monitoring of potential effects has been an integral part of the SEA process. Key stages of the SEA process include Task B5: *Mitigating adverse effects*, Task B6: *Proposing measures to monitor the environmental effects of plan or programme implementation* and Stage E: *Monitoring the significant effects of the plan or programme on the environment*). The SEA Directive also requires the significant environmental effects of implementing a plan to be monitored. The sections below describe:

- how these tasks have been addressed;
- how Yorkshire Water intends to ensure that the mitigation measures and monitoring plans are implemented for any adverse effects that are identified; and
- the means by which the environmental performance of the WRMP can be assessed.

## 6.2 Mitigation Measures

Mitigation may be defined as a measure to limit the effect of an identified significant impact or, through the most successful application, avoid the adverse impact altogether, the latter being the preferred option.

Consideration of mitigation measures has been an integral part of the SEA process. The SEA appraisals have been based on residual impacts, i.e. those impacts likely to remain after the implementation of reasonable mitigation. Certain assumptions have been made regarding this:

- Where suitable mitigation measures are known and identified within the WRMP, these have been taken into account, such that the resultant residual impact has been determined.
- In line with recommendations made in the UKWIR SEA Guidance[1], the SEA appraisals have assumed the implementation of reasonable mitigation, such as the use of good construction practice.

During implementation of a specific WRMP scheme, appropriate monitoring will be undertaken to track any potential environmental effects which will, in turn, trigger deployment of suitable and practicable mitigation measures.

## 6.3 Monitoring Requirements

Monitoring is required to track the environmental effects to show whether they are as predicted, to help identify any adverse impacts and trigger deployment of mitigation measures.

Key monitoring parameters are those relating to the abstraction of water and the effects this may have on waterbodies, their WFD waterbody status, and their functions as habitats. Changes to water levels can also affect archaeological and heritage assets. The WRMP may also cause more direct potential impacts on people living in urban areas, due for example to construction works and associated disturbance.

The effectiveness of the WRMP will be monitored and reported to the Environment Agency through the annual review process. The SEA focussed on impacts of individual schemes and programmes of schemes, as well as cumulative impacts of the WRMP with other plans. It is important to recognise that

[1] UKWIR (2012) Strategic Environmental Assessment and Habitats Regulation Assessment – Guidance for Water Resources Management Plans & Drought Plans (12/WR/02/A).

these monitoring recommendations are based on the current understanding of the scheme design. As options are brought forward for development, further monitoring requirements may be set out in EIA-related Environmental Monitoring Plans, borehole drilling and pump test consents, abstraction licences and other environmental permissions, or in Yorkshire Water voluntary best-practice monitoring plans accompanying scheme development. These will be discussed with relevant key regulatory bodies and stakeholders. In practice, close dialogue should occur between Yorkshire Water, Environment Agency, Natural England and any affected third parties to agree the appropriate scale and duration of such scheme-specific monitoring activities proportionate to the assessed environmental risks.

Higher level potential effects such as those on water resources, groundwater and river levels, as well as aquatic habitats, are monitored and reported routinely by the Environment Agency, in particular as part of the Water Framework Directive monitoring programme. Many company level effects, such as carbon dioxide emissions, are monitored and reported annually by Yorkshire Water.

**Table 6.1** identifies indicators for potentially significant effects which the WRMP could have on different receptors. Key monitoring parameters at the strategic WRMP level will be those relating to the abstraction of water and the effects that this may have on waterbodies and their functions as habitats. There are also direct potential impacts on humans, the built environment, terrestrial habitats, the atmosphere, landscape and heritage assets, which may arise from construction activities and/or scheme operation. Extensive primary data collection is neither feasible nor appropriate for this programme level of monitoring, and use should be made where possible of existing datasets and monitoring regimes.

Table 6.1 SEA Monitoring Parameters

| Impacted Receptor | SEA Topic | Indicator |
|---|---|---|
| Water resources, water quality, biodiversity | Water resources, water quality, biodiversity | No deterioration to WFD status of surface waters and groundwater waterbodies that may be affected by WRMP schemes.<br>Species and habitats surveys; hydrological and water quality surveys.<br>No deterioration in Condition Assessments for relevant European Sites and SSSIs that may be affected by WRMP schemes. |
| Human health and well-being, recreational resources | Population and Human Health | Scheme level community disruption of capital works would be monitored through EIA led Environmental Monitoring Plan if required.<br>Complaints logged with Yorkshire Water and Local Authority EHOs.<br>Responses gauged through Yorkshire Water customer satisfaction surveys.<br>Community investment, employee volunteering and match funding by Yorkshire Water. |
| Transport | Air and climate | Transport fleet fuel consumption, emissions and business mileage, as monitored by Yorkshire Water. |
| Air Quality | Air and climate | Scheme related issues of capital works would be monitored through EIA led Environmental Monitoring plan if required.<br>Changes in air quality are monitored by the Automatic Urban and Rural Network[2] and these data would be available if required to inform a baseline. Ricardo-AEA[3] maintains the Defra air quality monitoring network in order to assess the Government's legal |

[2] Automatic Urban and Rural Network (AURN)
[3] http://www.ricardo-aea.com/cms/

| Impacted Receptor | SEA Topic | Indicator |
|---|---|---|
| | | compliance through detailed ambient air quality modelling, these data could also inform the baseline. |
| Climate Factors | Air and climate | Net greenhouse gas emissions per Ml (million litres) of treated water (kg CO2 equivalent emissions per Ml). |
| Archaeology and cultural heritage | Archaeology and cultural heritage | Condition of buried archaeology would be monitored during construction e.g. through the EIA led Environmental Management Plan or through a Watching Brief and informed by Historic Environment Records.<br>Consultation with relevant stakeholders to ensure impacts are minimised, e.g. to water level dependent assets and reference to evolving databases such as English Heritage (now Historic England) (2011) National Monument Record Wetland Heritage List.<br>Number of schemes developed that maintain or raise groundwater levels<br>Number of schemes that enhance the significance of heritage assets or historic landscape character, especially those assets identified as at risk<br>Historic England monitor parameters such as Listed Buildings and Scheduled Monuments, in order to maintain an 'Heritage at risk' register.<br>The company will monitor the condition of assets under its ownership. |

Consideration of mitigation measures has been an integral part of the SEA process. The SEA Regulations state that monitoring must enable appropriate remedial action. For the monitoring programme to be effective, there must, therefore, be a mechanism in place to detect trends and to ensure that action is taken where trends are progressively adverse. Monitoring identified will require further consideration and iteration with the Environment Agency and Natural England, as preferred options are developed in the future. At the scheme level, EIA-led EMPs (or similar EMPs relating to other statutory permissions and approvals) will facilitate monitoring and trigger mitigation if required, particularly during and immediately after capital works. At a more regional level and during operation of schemes, monitoring of key environmental parameters, such as groundwater levels and emissions, will inform development of the next WRMP, both directly and through the SEA process.

Scheme-specific monitoring has been identified for:

- R9 North Yorkshire Groundwater Option
- R13 East Yorkshire Groundwater Option 2.

Results of the proposed monitoring, and any mitigation measures taken, will be included within the SEA for the subsequent WRMP 2019 development. Where appropriate, the data and findings will be reported in the annual WRMP update to the Environment Agency, particularly where this may lead to any changes to the plan or improved understanding of the impact of any scheme.

**Table 6.2** (reproduced from Table 11.1 in the WRMP2019) sets out the timetable for the scheme-specific monitoring and investigations required in support of scheme promotion and development and which will inform formal applications for any required abstraction licences, other environmental permits, any EIA scoping and planning permissions, as well as any scheme-specific HRA and WFD

assessments. For clarity, plan level HRA has been undertaken and this included a Stage 2 Appropriate Assessment of R9.

Five yearly assessment of the environmental baseline will be undertaken in preparation for the SEA of the subsequent WRMP. This will incorporate consideration of the parameters identified in **Table 6.1** and the scheme-specific requirements linked to the supply schemes shown in **Table 6.2**.

Table 6.2 AMP7 environmental investigations for options in the preferred plan (reproduced from WRMP)

| Potential scheme | Investigation | Driver | Timescale |
|---|---|---|---|
| R9 North Yorkshire Groundwater Option | HIA (hydrological impact assessment) – started<br><br>WFD – unlikely but subject to outcomes from HRA<br><br>EIA – No, licence increase | Increased risk of outages in North Yorkshire area due to housing developments in this area of the region | AMP6 (ongoing) investigation and licence application in 2022/23 |
| R13 East Yorkshire Groundwater Option 2 | HIA – Yes<br><br>WFD – Yes<br><br>HRA – No<br><br>EIA – No (assumed permitted development) | Water Quality – will provide additional blending in an area where outages occur due to nitrate | AMP7 investigation and licence application in AMP8 (2025/26) |

# 7 Availability of Documents

The adopted WRMP and accompanying SEA documentation is available on the Yorkshire Water website at:

www.yorkshirewater.com/resources

The documents are also available for inspection at:

c/o Asset Strategy Manager – Supply and Demand
Yorkshire Water
Western House
Halifax Road
Bradford
BD6 2SZ

# Appendix A SEA Post Adoption Procedures

Part 4 of The Environmental Assessment of Plans and Programmes Regulations 2004 (referred to as the "SEA Regulations") requires Yorkshire Water, 'as soon as is reasonably practicable' after the adoption of the WRMP, to:

1. Make a copy of the WRMP and Environmental Report available at its principal office for inspection by the public at all reasonable times and free of charge;
2. Notify the public and potentially affected parties of their availability;
3. Inform the statutory consultees and other parties who responded;
4. Issue a statement containing:
    - How environmental considerations have been integrated into the WRMP;
    - How the environmental report has been taken into account;
    - How consultation responses have been taken into account;
    - The reasons for choosing the WRMP as adopted;
    - Measures to monitor the significant environmental effects of the WRMP.

Requirements 1 to 3 have been fulfilled by the publication of the WRMP and SEA documents on Yorkshire Water website and informing all consultees of the publication. In addition, with respect to 1, a hardcopy will be available for inspection on request.

The publication of this SEA Post Adoption Statement fulfils Requirement 4.


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