Thames Water

Final Water Resources Management Plan 2019

SEA Post Adoption Statement

May 2020

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1 Introduction

1.1 Background to the Water Resources Management Plan 2019

Water resources management planning is undertaken by all water companies in England and Wales in order to ensure reliable, resilient water supplies over the long term planning horizon. The Water Resources Management Plan (WRMP) sets out how water companies aim to manage customer demands while meeting their requirements over the long term, ensuring sufficient water supplies are available to meet their customers' needs. The minimum planning horizon is at least 25 years, but in view of the water supply-demand challenges in its supply area, Thames Water has adopted a much longer 80-year planning horizon to 2100 for its 2019 WRMP. This particularly reflects the high anticipated population growth in the Thames Water supply area over this period. The planning process includes working out and forecasting how much water customers will need over the 80-year planning period (assessing future demand) and how best to provide it (assessing options to reduce or constrain demand growth and/or augment reliable supplies of water) in an efficient, timely manner (programme appraisal). Companies seek to identify the preferred, 'best value' programme of demand management and water supply options to maintain a balance between reliable supply and demand in each Water Resource Zone (WRZ) and for their supply area as whole (the WRMP).

Thames Water's draft WRMP 2019 (WRMP19) was submitted to Defra on 1 December 2017 and was published for public consultation in February 2018, alongside the Strategic Environmental Assessment (SEA) findings set out in the SEA Environmental Report. In light of the representations received from the public consultation and other developments (such as changes to demand forecasts and requirements for water supplies from neighbouring water companies), a revised draft WRMP19 was prepared and the SEA Environmental Report was also updated to reflect the revisions made. The updated SEA Environmental Report was used to inform ongoing engagement with regulators and stakeholders. A further consultation on this revised draft WRMP was held to provide the opportunity for comments to be made on the changes made to the draft WRMP. The feedback was considered and a response to the consultation along with an addendum to the updated SEA Environmental Report was published in April 2019.

The WRMP19 was published in April 2020 following receipt of approval from the Secretary of State on 31 March 2020, alongside the updated SEA Environmental Report.

1.2 The SEA Process

The Thames Water WRMP19 has been subject to SEA in compliance with the SEA Directive[1], as transposed in England by the SEA Regulations[2]. This SEA Post Adoption Statement was produced in accordance with the provisions of Regulation 16.

Engagement with government, regulators, other licensed water suppliers and water companies, customers and a wide range of stakeholders is key to the WRMP process. Thames Water's WRMP19 consultation programme commenced in 2015 and included a wide range of stakeholders and the regulators. The SEA process for Thames Water's WRMP19 started early in 2016 and ran in parallel with the development of the WRMP19.

The assessment stage of the SEA process was repeated for each revision of the WRMP19 up to and including the final plan publication to ensure that the findings of the SEA Environmental Report remained relevant to the plan. This is in accordance with the Government's SEA Guidance which states:

[1] 1 Directive 2001/42/EC of the European Parliament and of the Council on the Assessment of the Effects of Certain Plans and Programmes on the Environment

[2] The Environmental Assessment of Plans and Programmes Regulations, 2004 (2001/42/EC)

'It is important to keep the implications for the Environmental Report under review to ensure that it remains consistent with the plan or programme on which opinions are being sought.'

The SEA has been undertaken in parallel with the Habitats Regulations Assessment (HRA) and Water Framework Directive (WFD) assessment to ensure an integrated approach to environmental assessment of the WRMP19.

1.3 Purpose of the SEA Statement

The SEA Statement must describe:

- How environmental considerations have been integrated into the WRMP19 (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 WRMP19 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 WRMP19 (Section 6).

Appendix A sets out the post-adoption requirements of the SEA Regulations.

2 How Environmental Considerations Have Been Integrated into the WRMP19

WRMPs are developed to ensure a reliable, secure water supply over the long-term and that the measures proposed to maintain the balance between supply and demand for water provide value for money to Thames Water's customers, whilst taking account of environmental and social effects. The SEA, along with the findings of the HRA and WFD assessments, have been used to help inform the development of the Thames Water WRMP19.

At the outset of developing the alternative options to be considered for the WRMP19, SEA principles were used to carry out a high-level screening assessment of the options, starting with the initial screening assessment of a large number of 'unconstrained' options. The environmental performance of each option in respect of SEA principles, HRA and WFD were considered and this information used to help decide which options should be rejected and not taken further in the planning process. At this stage of the plan development, several options were rejected on environmental grounds (and often alongside other factors such as planning or engineering feasibility), mainly due to their likely major adverse effects on international environmental designations (for example, on European conservation sites or UNESCO World Heritage Sites).

Remaining options were then considered in more detail as part of a Feasible List of options through a Feasibility Assessment process (as described and summarised in the Feasibility Assessment Reports accompanying the WRMP19). This process included assessment of each Feasible option against key SEA topics, HRA screening and WFD screening criteria. This process also involved extensive engagement with regulators and stakeholders. The environmental assessments formed part of a wider set of assessments of each option, including appraisal against economic, engineering, resilience and planning considerations. From these assessments, decisions were made about which options should be taken forward to the Fine Screening process. The Fine Screening process included comparing options of the same option type (e.g. reservoirs, desalination schemes, water reuse schemes) against SEA, HRA and WFD criteria and considering potential cumulative effects with other options, projects, plans or existing schemes. Those options that performed best against all of the Fine Screening assessment 'dimensions' and criteria were taken forward to the Constrained List of options for further, more detailed evaluation, including development of environmental mitigation measures where required as part of the conceptual design of each option. The Fine Screening process was subject to extensive consultation with regulators and stakeholders, including discussions at specific technical meetings with relevant parties, through the WRMP19 Water Resources Forum and associated Technical Stakeholder Meetings, as well as through written submissions. Feedback from this engagement activity helped to refine and finalise the final decisions on which options were taken forward to the Constrained list of options for further development and detailed SEA, HRA and WFD assessment. Further details are provided in the Fine Screening Report and the process is explained in Section 7 of the WRMP19.

For those options taken forward to the Constrained list, the options were disaggregated into their key component 'elements' and a conceptual design was developed for each of these 'option elements' (e.g. water source, raw water conveyance pipeline, water treatment works). Consideration of mitigation measures was a key component of the development of the conceptual designs, assessing the potential adverse effects and beneficial effects of each option element and identifying mitigation measures to reduce adverse effects or, where feasible, to enhance beneficial effects. The final conceptual designs for each option element were then assessed through the SEA (and HRA and WFD assessments) based on the residual effects after application of the identified mitigation measures. These mitigation measures were developed in an iterative manner between the design engineers and the environmental assessment team. The effects assessment was undertaken in accordance with the SEA Framework developed and consulted on at the SEA Scoping Report stage. The assessment also included production of a set of environmental metrics (numerical values from 0 to 10 to summarise the findings of the SEA adverse and beneficial effects assessment). The environmental metrics were developed in order to incorporate environmental and social considerations directly into the Thames Water programme appraisal optimisation model which was

used to help inform the selection of a short-list of reasonable alternative programmes and scheduling of options over the planning horizon. The environmental metrics were generated solely for the programme appraisal modelling and were not used in the SEA effects assessment of the various alternative programme options developed from the outputs of the programme appraisal model. The environmental metrics provided an important tool to ensure that the environment could be explicitly considered within the programme appraisal modelling.

The detailed findings of the SEA effects assessments of the option elements, along with the summary environmental metrics, were discussed and presented to regulators and stakeholders, including at specific technical meetings with regulators and at various Water Resources Forum and Technical Stakeholder meetings, as well as being made available to regulators and stakeholders via the Thames Water website: comments and challenges provided through this consultation activity helped to refine and finalise the SEA effects assessments and environmental metrics prior to the programme appraisal stage of the plan development.

The primary aim of the WRMP19 programme appraisal process was to determine the 'best value' programme and timing of various supply and/or demand management options to secure a supply-demand balance across the Thames Water supply area for the next 80 years to 2100. The process was informed by Thames Water's programme appraisal modelling tools which produced a wide range of different programmes optimised on a range of key selection criteria including whole-life cost, customer acceptability, resilience and environmental and social effects (represented by the environmental metrics described above). These alternative programmes included various options (comprising one or more option elements) to address the forecast supply deficit. The alternative programmes and their constituent options were reviewed for their relative performance against key decision-making criteria, including environmental and social performance using the SEA effects assessment framework (i.e. the same framework used to assess the option elements earlier in the planning process).

The SEA process was used to help develop and then assess a short-list of alternative programmes using the effects assessment framework methodology to provide the Thames Water decision-makers with a detailed appraisal of the relative environmental and social performance of each alternative programme. This SEA information was then used by Thames Water to help determine decisions on the preferred programmes for each WRZ and for the company's supply area as a whole (the WRMP19). Finally, the WRZ preferred programmes and the plan as whole were assessed by the SEA framework methodology to determine the environmental effects of the WRMP19.

The assessment process and findings were set out in the SEA Environmental Report for public consultation for both the draft WRMP19 and the revised draft WRMP19 as described further in Section 4 of this SEA Statement.

3 How the Environmental Report Influenced the WRMP19

The SEA Environmental Report and the WRMP19 were developed in parallel so that the SEA process could actively inform the decision-making processes involved in producing the WRMP19. Table 3.1 identifies the main findings and outputs of the SEA Environmental Report which informed the development of the WRMP19.

Table 3.1 Environmental Report Findings and Consideration in the WRMP19

SEA Finding/Output	How was this integrated into the WRMP19
Options and Programme Environmental Effects	
Screening of options included consideration of SEA topics as well as risks to WFD water body status and the risk of any likely significant effects on European sites designated under the Habitats Directive. The screening stages ensured that the final 'constrained' list of options did not include options that would have unacceptable environmental or social impacts.	Several options were rejected from the unconstrained list on environmental grounds (and often alongside other factors such as planning or engineering feasibility), mainly due to their likely major adverse effects on international environmental designations. These are set out in the Option Screening Reports. Remaining feasible options were subject to a further "Fine Screening" process which took account of SEA topics in the environmental screening of the options. Those options not taken forward from the 'feasible' list to the 'constrained' list following the fine screening process are detailed in the Fine Screening Report and option rejection register (WRMP19 Appendix Q).
For those options taken forward to the Constrained list, the options were disaggregated into their key component 'elements' and a conceptual design was developed for each of these 'option elements'. The final conceptual designs for each option element were assessed through the SEA (and informed by the parallel HRA and WFD assessments) based on the residual effects after application of the mitigation measures developed as part of the conceptual design of each option element. .	The SEA effects assessment of the option elements provided Thames Water with key information about the environmental performance of each element in comparison to others. The findings were shared extensively with regulators and stakeholders and assessments updated to reflect comments received prior to the WRMP19 programme appraisal process. Whilst no option elements were excluded from the draft WRMP19 programme appraisal process on environmental grounds, following representations on the draft WRMP19 the Teddington DRA option elements were excluded from the Constrained List and programme selection for the revised draft WRMP19 on account of the WFD challenges in respect of the lower River Thames and upper reaches of the Thames Tideway.
A wide range of alternative programmes and associated options were generated from the Thames Water programme appraisal model and reviewed against the SEA effects assessment methodology.	A short-list of six reasonable alternative programmes was selected by Thames Water, taking into account of the SEA effects assessment as well as other decision-making criteria, such as cost, affordability and water supply resilience. The non-shortlisted programmes offered either no material improvement

SEA Finding/Output	How was this integrated into the WRMP19
	compared to the short-listed programmes or marginal improvements in some of the assessment criteria metrics and significant detriment to others.
The SEA of each of the reasonable alternative programmes highlighted that given the scale of the supply deficit faced over the next 80 years, it was not considered feasible to develop a programme that would lead to only minor adverse cumulative effects. Some major adverse effects from options are therefore inevitable, albeit that they can be mitigated such that, overall, the environmental and social effects of the programmes are predominately of a minor to moderate significance (both adverse and beneficial effects).Three of the six programmes were assessed as having potential for some cumulative major adverse effects. All of these programmes showed several WFD cumulative compliance risks. They would present significant challenges for promotion and obtaining required permissions and approvals. The other three programmes were assessed as having the potential for cumulative moderate adverse effects. These are broadly similar in overall scale of effects with little to choose between them, but a relative ranking showed that one had the fewest environmental challenges due to a much smaller programme of schemes. For these programmes, it was identified that WFD risks were likely to be unacceptable in relation to the Britwell groundwater option and that identified mitigation measures need to be applied for specific other options to ensure WFD compliance. Programmes that involve both the South East Strategic Reservoir and the Severn-Thames Transfer at high transfer volumes were shown to give rise to WFD cumulative compliance risks in the Middle River Thames as discharges to the river would exceed the approximate 500 Ml/d threshold above which changes to the low flow regime may start to adversely affect aquatic ecology and geomorphology of the river reach downstream of Culham.	The SEA effects assessment of six alternative programmes considered the individual effects of each of the options within the programme and their cumulative effects, both between the various options and with other plans and projects. The SEA findings of the six reasonable alternative programmes were used by Thames Water to help inform its decision-making on the final preferred programmes for the WRMP19. In view of the WFD risks associated with the Britwell groundwater option, it was decided to remove this option from the preferred programme. Given that all of the alternative programmes are characterised by at least moderate adverse cumulative environmental effects, consideration was given through the SEA process as to how each of these alternative programmes might be improved to improve the environmental performance. This process helped to further identify those features of each programme that present the greatest environmental challenges and which should be avoided in developing the preferred programme. Discussions on the selection of a preferred programme also explored the potential additional measures that could be incorporated into the preferred programme to improve the overall environmental outcomes of the plan. Such considerations also reflected the strong stakeholder feedback on the draft WRMP19 that Thames Water needed to secure greater environmental benefits from delivery of its WRMP19 given the environmental dis-benefits associated with development of major new water sources. This led to consideration through the SEA process as to how wider environmental benefits from implementing the plan could be delivered. The SEA process helped with decision-making about the appropriate strategic schemes to be included in the preferred plan. The SEA indicated that inclusion of the largest (150 Mm^3) South East Strategic Reservoir option, timed with the need from Affinity Water, would present an overall environmental acceptable solution to the wider South East England supply deficit. As well as helping Affinity Water address its supply deficit, delivery of the largest South East Strategic Reservoir option creates

SEA Finding/Output	How was this integrated into the WRMP19
Programmes that involve both desalination and reuse schemes at a cumulative capacity above 275 Ml/d were shown to give rise to possible WFD compliance risks in the Thames Tideway due to potential effects on saline-sensitive aquatic species, and potential effects regarding the Recommended Thames Estuary Marine Conservation Zone (MCZ). The assessments also demonstrated that there are viable alternative options available for each of the different programmes at comparable levels of environmental effects.	sufficient surplus in the Thames Water supply-demand balance which can be used to facilitate a reduction in some of Thames Water's abstractions that are perceived to have an adverse impact on vulnerable chalk streams. Delivering this environmental improvement will require a number of new pipelines and pumping stations to be constructed to ensure that customers continue to receive a resilient water supply. These additional "chalk stream" improvement options were assessed as part of the SEA of the preferred programme and shown to have mostly beneficial effects. The resulting preferred programme was subject to SEA, HRA and WFD assessment, including cumulative assessment with other programmes, plans and projects, in order to confirm the WRMP19 was environmentally acceptable.
Cumulative Effects of the Preferred Programme	
No adverse cumulative effects were identified by the SEA effects assessment as a result of delivery of the preferred programmes included in the final WRMP. This included confirming no adverse cumulative effects with neighbouring water company WRMPs or Drought Plans. The potential for cumulative effects with other land use and development plans identified a number of considerations for the future but no cumulative effects with known land use and development projects.	In developing the preferred programme, the major cumulative adverse effects highlighted in the SEA of the reasonable alternative programmes (and particularly in respect of WFD cumulative compliance risks) have been avoided in the final preferred programme by excluding cumulative option development that would adversely affect the Thames Tideway and ensuring the future cumulative flow support volumes to the middle River Thames remains below the threshold at which adverse effects could arise. Cumulative beneficial of demand management measures in Thames Water's Drought Plan, and with similar measures in other company WRMPs and Drought Plans, were identified in terms of the reduction in the growth of water abstraction from the water environment, as well as lower energy use and carbon emissions from reduced water pumping and treatment. The WRMP19 includes additional demands on the Thames Water supply system from some of the neighbouring water companies for additional bulk water supply exports. These extra supplies provide cumulative major beneficial effects by using sustainable water resource developments to secure reliable and resilient water supplies to the wider South East of England.

SEA Finding/Output	How was this integrated into the WRMP19
Mitigation of the WRMP19 schemes	
Consideration of mitigation measures has been an integral part of the SEA (and associated HRA Appropriate Assessment and WFD assessment) process in development of the WRMP19 from the very outset. A wide range of mitigation and enhancement measures have been incorporated into the option element conceptual designs to address both potential construction-related effects and potential operational effects. Several specific mitigation measures have been identified by the SEA, HRA and WFD assessment process as summarised in Appendix I of the SEA Environmental Report. In particular, several schemes included in the preferred WRMP19 programme include some significant residual effects requiring the application of specific mitigation measures	An iterative approach to mitigation measures was followed, with the initial screening assessments identifying potential adverse effects and mitigation measures being explored to reduce their magnitude. As more detailed assessments of the feasible options were carried out, and consultees provided feedback on the options, the mitigation measures were further refined and incorporated into the conceptual design (and costs) of the option elements included in the programme appraisal model. Following the development of the preferred programmes for each WRZ and the Thames Water supply area as a whole, the SEA, HRA and WFD assessments identified some additional mitigation measures to address adverse effects. In a similar way, opportunities for enhancing identified beneficial effects were also considered throughout the SEA, HRA and WFD assessment process. A wide range of mitigation and enhancement measures have been incorporated into the WRMP19 to address the risks of potential adverse construction or operational effects identified by the SEA process. Such measures include the preparation of Construction Environmental Management Plans for each development and use of ground reprofiling and mitigation planting to screen new developments. Thames Water will continue to work closely with the Environment Agency, Natural Resources Wales, Historic England and Natural England to agree the further specific design details of these mitigation measures. This further work will be carried out as part of the detailed design and refinement of all schemes in the WRMP19 as they are brought forward for more detailed planning, in order to seek opportunities to further reduce the identified adverse residual effects and increase beneficial residual effects.
Construction works to expand the capacity of Thames Water's Kempton and Coppermills Water Treatment Works included in the WRMP19, as well as construction of the Deephams Reuse scheme, South West London 'chalk streams' pipelines and River Lee New Gauge 'chalk streams' pipeline schemes will require mitigation measures as set out in the HRA Report and the SEA Environmental Report. This includes mitigation measures to protect designated	The SEA (and associated HRA Appropriate Assessment) process highlighted the need for mitigation measures to be included in the WRMP19 for the construction period to protect designated bird species associated with nearby Special Protection Areas and Ramsar sites (these are internationally important conservation sites designated for the protection of important bird species and their habitats). Thames Water will work with Natural England to confirm and agree the final mitigation measures as planning for these works progresses.

SEA Finding/Output	How was this integrated into the WRMP19
bird species that may be affected by construction work activities. Where possible, any new water conveyance tunnels will be aligned so that historic assets are outside the zone of influence. Where this is not possible, due to constraints on the alignment, detailed settlement analysis will be undertaken to demonstrate how best to minimise the impacts during construction. This will include stringent control and monitoring requirements during tunnelling, to limit settlement. Specific additional mitigation measures may also be required for some cultural heritage assets to further reduce the potential residual effects	The SEA process also identified the need to include mitigation measures in the WRMP19 to protect various historic heritage assets. Close liaison with Historic England and local conservation groups will be required during design development to agree the final mitigation measures for heritage value.
Construction works necessary to provide a new fully bunded South East Strategic Reservoir, the associated conveyance tunnel and intake / discharge structure at Culham on the River Thames and enabling structures including temporary railway siding, contractor's area and access and haul roads. In addition to construction best practice, further construction mitigation measures in the form of extensive vegetation planting around the reservoir margin as well as compensatory measures to enhance lower quality habitat in the vicinity of the reservoir to replace lost habitat will be developed in close dialogue with regulatory bodies, planning authorities, interested stakeholders and local communities. The scheme will involve the removal and rerouting of several small watercourses, mitigation measures will be set out in a Flood Risk Assessment (FRA) in support of an application for a flood risk activity permit where required. Results from previous surveys and excavations of the reservoir site identifies moderate archaeological potential (prehistoric and roman). The SEA identified that further archaeological work will be required to be undertaken during the construction of the reservoir. The SEA also identified that the development of a bunded reservoir will	The SEA identified that, where applicable (and depending on updated bird surveys to be carried out as part of the detailed design of the scheme), that mitigation measures need to be included in the WRMP19 and developed in advance of reservoir construction so as to minimise effects on identified bird species. There will be further work to confirm floodplain compensation requirements and to examine the opportunity to reduce the risk of flooding in the local area. The SEA process identified the need to include mitigation measures in the WRMP19 to protect known and possibly buried heritage assets. Further meetings will be held with Historic England and Oxfordshire County Council to confirm the final mitigation measures as part of the detailed design process. Mitigation measures will include review of previous desk based and field studies, further targeted field evaluations and targeted excavations alongside watching briefs during overburden stripping where archaeology has been identified. As part of any future application for consent further studies will be commissioned, including landscape and visual impact assessments, that will help inform the detail of mitigation measures such as landscape proposals. The SEA process also identified the need to include mitigation measures in the WRMP19 to mitigate potential landscape and visual impacts. During construction embankment heights and the steepness of the side slopes will be limited. While use of ground reprofiling, extensive planting, forming new hedgerow and woodland links and grassland would be applied to help integrate the new feature into the

SEA Finding/Output	How was this integrated into the WRMP19
insert a new feature into the landscape. In consequence, compensatory and enhancement landscape features will be developed in close dialogue with regulatory bodies, planning authorities, interested stakeholders and local communities.	wider landscape. New opportunities would be created for improved access, recreation and amenity provision across the area of the reservoir sensitive design and landscape treatment around the new reservoir.

4 Consultation on the SEA

4.1 Introduction

The SEA Regulations require consultation at two stages in the SEA process: at the scoping stage and on the assessments as documented in the SEA Environmental Report. The SEA Regulations define the consultation bodies according to the spatial extent of the plan. If a plan will only affect England, the consultation bodies are the Environment Agency, Natural England and Historic England. If the plan may affect other parts of the UK, the consultation bodies are widened to reflect this. The Scoping Report was issued to the English and Welsh statutory consultation bodies. The Welsh bodies (Natural Resources Wales, Cadw) plus Welsh Government were included because options to transfer water from part of the River Severn catchment and part of the River Wye catchment on the England/Wales border were included on the constrained list of options being considered by Thames Water in developing its WRMP19.

Thames Water consulted both the English and Welsh statutory consultation bodies and the public on the SEA Scoping Report and on the SEA Environmental Report that accompanied the draft and revised draft WRMP19. Thames Water carried out much wider and extensive consultation than required by the SEA Regulations, with consultation commencing well in advance of the SEA Scoping Report and throughout the development of the draft and revised draft WRMP19 in advance of the formal SEA Environmental Report publication. Findings from initial SEA screening through to the draft WRMP19 SEA option element assessments were communicated, discussed and comments invited from all parties, particularly through the regular Water Resources Forum established by Thames Water to facilitate stakeholder engagement on the draft WRMP19. A regular series of Technical Stakeholder Meetings were also held at which emerging findings from the SEA were presented and discussed. Additionally, a range of specific meetings with specific regulators and stakeholders on particular options were held to examine SEA and associated environmental issues in more detail. The key SEA findings were also made available on the Thames Water website, with comments invited from the public, stakeholders and regulators prior to the formal SEA Environmental Report being published for statutory consultation.

Consultation on the SEA Scoping Report took place between 25th July 2016 and 7th September 2016 (7 weeks) and was issued to both the statutory consultees and wider stakeholders, as well as published on the Thames Water website. Feedback on the Scoping Report from consultees was used to refine the environmental baseline, SEA objectives and effects assessment framework methodology. The SEA Environmental Report was published alongside the draft WRMP19 between 9th February and 29th April 2018 for public consultation on the Thames Water website and also issued to the statutory consultation bodies and all stakeholders. This provided an opportunity for the statutory bodies, stakeholders and the public to express their views on the findings of the Environmental Report along with their views on the draft WRMP19. A wide range of representations were received on the SEA Environmental Report as set out in the Statement of Response published by Thames Water on its website in September 2018. A revised draft WRMP19 was prepared taking into consideration the representations received on the draft plan and accompanying SEA Environmental Report. The published Statement of Response indicates the changes made to the draft WRMP19 and to the SEA Environmental Report as a result of the representations. An updated SEA Environmental Report was produced and published for consultation alongside the revised draft WRMP19 and used to inform further consultation with regulators and stakeholders. A second Statement of Response was produced along with an Addendum to the revised draft WRMP19. These were published in April 2019 detailing the consideration given to representations received and changes made to the revised draft WRMP19 as a result of that consideration.

Following approval by the Secretary of State in March 2020, the WRMP19 was published in April 2020 on the Thames Water website, accompanied by an updated final version of the SEA Environmental Report.

This SEA ‘Post Adoption’ Statement sets out how the SEA and any views expressed by the statutory consultation bodies or the public, in relation to environmental matters, have influenced the WRMP19.

Table 4.1 lists the main documents relating to the WRMP19 environmental assessments and provides their publication dates.

Table 4.1 Summary of Key Published WRMP19, SEA, HRA and WFD Documentation

Document	Date of Publication	Purpose
SEA Scoping Report	July 2016	Issued to public and statutory bodies as vehicle for consultation on scope and approach for SEA.
Draft WRMP19	February 2018	Issued for formal consultation to understand the views and priorities of customers and stakeholders.
SEA Environmental Report for the draft WRMP19	February 2018	Issued with the draft WRMP19 to document the environmental assessments supporting the draft WRMP19.
HRA Report for draft WRMP19	February 2018	Issued to fulfil Habitats Directive requirements for the draft WRMP19.
WFD Compliance Assessment Report for draft WRMP19	February 2018	Issued to fulfil WFD objectives and statutory requirements for the draft WRMP19.
Statement of Response (SoR) No 1	October 2018	Responded to the comments received from consultation on the draft WRMP19, including those relating to SEA, HRA and WFD assessments. The SoR explained consideration of the feedback and the changes made to the draft WRMP19.
Revised draft WRMP19	October 2018	A revised draft WRMP19 taking into consideration the representations received on the draft plan and the SoR No 1 and indicating the changes made to the draft WRMP19.
SEA Environmental Report for the revised draft WRMP19	October 2018	Issued with the revised draft WRMP19 to document the environmental assessments supporting the revised draft WRMP19.
HRA Report for revised draft WRMP19	October 2018	Issued to fulfil Habitats Directive requirements for the revised draft WRMP19
WFD Compliance Assessment Report for revised draft WRMP19	October 2018	Issued to fulfil WFD objectives and statutory requirements for the revised draft WRMP19
Statement of Response (SoR) No 2	April 2019	Sets out the comments received from the further consultation in Autumn 2018 and explains how these were taken into account.
Technical Update Note	April 2019	Sets out the specific changes made to each of the sections in the technical report and technical appendices of the revised draft plan.
Addendum to the SEA report	April 2019	Sets out changes required to the SEA report following further public consultation on the revised draft plan
Addendum to the HRA report	April 2019	Sets out changes required to the HRA report following further public consultation on the revised draft plan.
Addendum to the WFD Assessment report	April 2019	Sets out changes required to the WFD report following further public consultation on the revised draft plan.
Secretary of State letter of approval for WRMP19 publication	March 2020	Instruction to publish Final WRMP19 in accordance with Regulation 6 of the Water Resources Management Plan Regulation 2007.
WRMP19	April 2020	WRMP19 published on Thames Water's website.

Document	Date of Publication	Purpose
SEA Environmental Report for the WRMP19	April 2020	Issued with the WRMP19 to document the environmental assessments supporting the development of the WRMP19. Published on Thames Water's website.
HRA Report for the WRMP19	April 2020	Issued to fulfil Habitats Directive requirements for the WRMP19. Published on Thames Water's website.
WFD Compliance Assessment Report for WRMP19	April 2020	Issued to fulfil WFD objectives and statutory requirements for the WRMP19, Published on Thames Water's website.
SEA Post Adoption Statement for WRMP19	May 2020	Sets out how the SEA and any views expressed by the consultation bodies or the public have influenced the development of WRMP19

4.2 Consultation on the Draft and Revised Draft WRMP19

The responses to the consultation on the draft WRMP19 which relate to the SEA, HRA and WFD were included in the Statement of Response No 1 (SoR No 1) and associated revised draft WRMP19 that were published on Thames Water's website in October 2018:

https://corporate.thameswater.co.uk/about-us/our-strategies-and-plans/water-resources

The responses to the consultation on the revised draft WRMP19 which relate to the SEA, HRA and WFD were included in the Statement of Response No 2 (SoR No 2) and associated SEA, HRA and WFD Addendum documents that were published on Thames Water's website in April 2019:

https://corporate.thameswater.co.uk/about-us/our-strategies-and-plans/water-resources

The Environmental Report, HRA Report and WFD Compliance Assessment Report for the WRMP19 took account of the comments made by consultees on the draft and revised draft WRMP19 and the commitments made by Thames Water in these two Statement of Response documents in and the Addendum documents published in April 2019.

5 Rationale for Selection of Options for the WRMP19

5.1 Option Level Alternatives

For those options taken forward to the Constrained list (after the Feasibility Assessment process), the options were disaggregated into their key component 'elements' and a conceptual design was developed for each of these 'option elements'. Consideration of environmental mitigation measures was a key component of the development of the conceptual designs, assessing the potential adverse effects and beneficial effects of each option element and identifying mitigation measures to reduce adverse effects or, where feasible, to enhance beneficial effects. The final conceptual designs for each option element were then assessed through the SEA (and HRA and WFD) effects assessment framework methodology based on the residual effects after application of the identified mitigation measures. These measures were developed in an iterative manner between the design engineers and the SEA assessor team.

5.2 Programme Level Alternatives

Programme appraisal is the process by which alternative programmes of options (comprising of one or more option elements) to meet the forecast supply deficit are considered using a water resources planning optimisation model involving various criteria, including environmental effects, cost and supply resilience. The WRMP19 SEA process involved assessing the different programmes against the SEA effects assessment framework methodology and using this information to help decision-makers determine the final Preferred Programme presented in the WRMP19, as well as assessing the plan as a whole (as described in Section 10 WRMP19). The primary aim of the WRMP19 programme appraisal process (including the SEA process) is to determine the 'best value' programme of supply and/or demand management options to secure a supply-demand balance across the Thames Water supply area.

The process involved assessing a wide range of different, alternative programmes optimised on a range of key selection criteria. The relative performance of each programme against key decision-making criteria, including environmental and social performance as determined by the SEA process informed a decision on a short-list of reasonable alternative programmes for further detailed environmental assessment through the SEA process.

The six alternative programmes short-listed for further detailed SEA appraisal (and HRA and WFD assessments) were:

- Favouring intergenerational equity (Min_IGEQ) [3]
- Favouring resilience and cost equally (Multi-Obj_RES)
- Favouring customer preference for the frequency of restrictions and cost equally (Multi-Obj_FP)
- Favouring resilience with a programme cost restriction of 120% of least cost (NearO_RES)
- Favouring customer preference for type of options with a programme cost restriction of 120% of least cost (NearO_TP)[4]
- Least cost programme (Phased_LC).

[3] Min_IGEQ = (Minimum Intergenerational Equity) An optimisation run that uses a 1% discount rate instead of 3.5% in order to decrease the incentive to defer spend to the future. The lower the values, the greater the intergenerational equity provided by the programme.

[4] NearO_TP = (Near optimal type preference) An optimisation run that meets customer preferences for option type, constrained to within 120% of the Least Cost

For each of these short-listed reasonable alternative programmes, SEA (effects assessment (along with HRA and WFD assessments) were carried out for each of the options (schemes) within the programme, both individually and then cumulatively within and across all of the WRZs in the Thames Water supply area, and also at the plan level as a whole. Importantly, the assessments were based on the residual effects after application of mitigation measures included in the conceptual design (and cost) of each scheme. The findings were used by Thames Water to help inform its decision-making to develop its final preferred programme for each WRZ and the WRMP19 as a whole.

The SEA of each of the reasonable alternative programmes highlighted that:

- Given the scale of the supply deficit faced over the next 80 years, it was not considered feasible to develop a programme that would lead to only minor adverse cumulative effects. Some major adverse effects from options are therefore inevitable, albeit that they can be mitigated such that, overall, the environmental and social effects of the programmes are predominately of a **minor to moderate** significance (both adverse and beneficial effects).
- Three of the six programmes (Multi_Obj_RES, Multi_Obj_FP and NearO_RES) were assessed as having potential for some cumulative **major adverse effects**, with the Multi_Obj_FP programme having the greatest magnitude of cumulative adverse effects. All of these programmes have several WFD cumulative compliance risks. They would present significant challenges for promotion and obtaining required permissions and approvals.
- The other three programmes were assessed as having the potential for cumulative **moderate adverse effects**. These are broadly similar in overall scale of effects with little to choose between them, but a relative ranking shows that the NearO_TP programme had the fewest environmental challenges due to a much smaller programme of schemes. For these programmes, WFD risks could be addressed if the Britwell groundwater option was removed from relevant programmes and mitigation measures were applied where identified for specific other options in the WFD assessments.
- Effects are geographically spread across the Thames river basin: some programmes lead to greater effects in the Thames Tideway whilst some others result in the concentration of effects in the Middle Thames. Some programmes also affect the Severn river basin, increasing the overall magnitude of cumulative effects (mainly due to inclusion of the Minworth flow support option for programmes that include the Severn-Thames Transfer) which brings WFD compliance risks.
- Programmes that involve both the South East Strategic Reservoir and the full Severn-Thames Transfer gave rise to possible WFD cumulative compliance risks in the Middle River Thames as discharges to the river would exceed the approximate 500 Ml/d threshold above which changes to the low flow regime may start to adversely affect aquatic ecology and geomorphology of the river reach downstream of Culham.
- Programmes that involved both desalination and reuse schemes at a cumulative capacity above 275 Ml/d gave rise to possible WFD compliance risks in the Thames Tideway due to potential effects on saline-sensitive aquatic species, and may also affect the Recommended Thames Estuary Marine Conservation Zone (MCZ).

Given the fact that all of the alternative programmes are characterised by at least moderate adverse cumulative environmental effects, consideration was given as to how each of these alternative programmes might be improved so as to improve the overall environmental performance. This element of the SEA process helped to further identify those features of each programme that present the greatest environmental challenges and which should be avoided in developing the preferred programme.

Discussions on the selection of a preferred programme also explored, through the SEA process, the potential additional measures that could be incorporated into a preferred programme to improve the overall environmental outcomes of the plan. Such considerations also reflected the strong stakeholder feedback that Thames Water needed to secure greater environmental benefits from delivery of its WRMP19 given the environmental dis-benefits associated with development of major new water sources.

Through the SEA process, and taking account of other decision-making criteria, Thames Water developed a preferred programme as set out in the WRMP19. The schemes forming this preferred programme are compliant with Habitats Regulations with delivery of specified construction mitigation measures identified in the HRA report. The schemes forming this programme are also compliant with the WFD objectives, with no risk of WFD status deterioration subject to further surveys to confirm the WFD assessments and, where applicable, the implementation of mitigation measures as described in the SEA Environmental Report.

The preferred programme presents several challenges in delivery and operation from a planning and environmental perspective, requiring agreement of extensive mitigation measures for several schemes to avoid adverse effects in relation to European Sites and national environmental designations (including SSSIs, AONBs and heritage designations). The environmental performance of this programme is characterised by **moderate adverse effects** but has the advantage over any of the reasonable alternative programmes considered by:

- Removing schemes with WFD compliance risks (i.e. excludes the Minworth and Britwell options)
- Reducing the scale of the cumulative effects of the Severn Thames transfer and South East Strategic Reservoir at Culham to an acceptable total volume of river flow regulation of the River Thames that avoids cumulative WFD compliance risks to the Middle River Thames water bodies.
- Avoids cumulative WFD and Recommended MCZ compliance risks for the Thames Tideway by only developing a relatively small reuse scheme at Deephams.
- Provides for a material reduction in abstraction by Thames Water in low flow conditions from various vulnerable chalk streams and water courses by creating sufficient supply headroom and developing additional water supply transfer infrastructure from 2037/38. This measure materially improves the overall environmental performance of the WRMP19.

6 Monitoring of the WRMP19

The SEA Regulations require the responsible authority (in this case, Thames Water) to:

> *'monitor the significant environmental effects of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action.'*

Monitoring will track the residual environmental effects of implementing the WRMP19 to show whether they arise as anticipated in the SEA, will help identify any other adverse impacts and will trigger deployment of any of the mitigation measures as required. Monitoring recommendations are based on the current understanding of the option design. The monitoring programme will be refined as schemes progress through the detailed planning and environmental approvals stage. The plan will include:

- Scheme-specific monitoring requirements and targets that focus on scheme-specific risks, habitats, species and sites; and
- Strategic, regional and local monitoring requirements and targets to ensure that monitoring is conducted at a suitable spatial scale that reflects the scale and risks of each scheme and the overall programme.

The monitoring plan will be owned and implemented by Thames Water and will be developed to reflect the phasing of the preferred programme. The monitoring plan will be further developed beyond this report during the implementation of WRMP19 in consultation with Natural England, the Environment Agency, Natural Resources Wales and Historic England to make best use of available data, to share existing monitoring locations and, where possible, locate new monitoring sites in locations that not only meet scheme-specific requirements but provide additional value to the monitoring programmes of the statutory bodies.

The natural, built and human SEA receptors potentially affected by the WRMP19 are set out in Table 6.1 with monitoring indicators provided alongside. These proposed indicators would form the core component of the monitoring programme to assess whether the identified effects in the SEA are occurring as anticipated, or whether it is giving rise to greater or lesser effects (adverse or beneficial). In turn, the monitoring may identify changes to the mitigation measures necessary to minimise adverse effects and/or modifications to scheme design or operation to further augment beneficial effects. These will enable Thames Water to develop and implement a monitoring programme to establish whether the WRMP is performing as expected over the coming years as anticipated by the SEA findings.

Table 6.1 Proposed receptors and indicators for the SEA monitoring programme

Receptor	Monitoring Indicators
Water resources, water quality, biodiversity	Changes in WFD condition status (both adverse and positive) of surface waters and groundwater waterbodies and number of water bodies where no deterioration to current WFD status has arisen Site-specific Protected Species and Habitats surveys Condition of European Sites and SSSIs according to Natural England condition assessments Progress against the Thames Water publication: *Our Biodiversity Policy*
Climate Factors	Net greenhouse gas emissions per Ml (million litres) of treated water (kg CO2 equivalent emissions per Ml) reported annually by Thames Water.

Receptor	Monitoring Indicators
	Progress against company target to achieve net zero carbon from operational emissions by 2030 and go beyond this by 2040.
Transport	Scheme level traffic disruption due to construction works / during operation (where applicable) will be monitored through appropriate Environmental Management Plans agreed as part of the planning permission process which would establish agreed traffic routes and traffic levels and timings
Nuisance/ Community Amenity Effects	Scheme level community disruption due to construction works / during operation (where applicable) will be monitored through Environmental Management Plans such as a Construction Environmental Management Plan (CEMP) and Transport Logistics Plans agreed as part of the planning permission process Complaints logged with Thames Water and Local Authority Environmental Health Officers or equivalent Responses gauged through customer satisfaction surveys and reported in Thames Water's annual performance processes Surveys of recreational and other amenities likely to be affected, including assessment of the success of agreed mitigation measures.
Air Quality	Scheme-specific monitoring during construction works / during operation (where applicable) will be monitored through an Environmental Management Plan agreed as part of the planning permission process Changes in air quality as monitored by the Defra Automatic Urban and Rural Network (for example nitrogen oxide), including using these data to establish the baseline conditions.
Landscape and visual amenity	Baseline, construction phase and operational phase Landscape and Visual Impact Assessments or equivalent assessment techniques of sensitive landscapes (including townscapes where applicable) and visual amenity identified in the SEA (and subsequent planning application submissions) as being at a major or moderate adverse effect. Assessments will be carried out in consultation with appropriate bodies, such as the relevant AONB committees and Natural England. These surveys will aid planning and evaluation of the success of proposed mitigation measures to reduce adverse effects on the landscape and visual amenity.
Cultural Heritage	Consultation with Historic England, heritage asset owners and other relevant stakeholders will take place to ensure adverse impacts are minimised and opportunities sought for heritage discovery and/or maintenance Condition of buried archaeology will be monitored during construction works as part of a Watching Brief and associated response measures as set out in the Environmental Management Plan agreed as part of the planning permission process Reference to Historic England's monitoring of heritage assets such as Listed Buildings and Scheduled Monuments, Registered Battlefields, Registered Parks and Gardens, in particular the 'Heritage at risk' register.

As options are brought forward for development, further specific monitoring requirements may be incorporated in detailed designs and plans accompanying scheme development (including, where applicable, formal applications for any required environmental permits or abstraction licences, planning permission, as well as any scheme-specific HRA and WFD assessments). These will be discussed with relevant regulatory and statutory bodies and stakeholders to agree the appropriate scale and duration of such scheme-specific monitoring activities proportionate to the assessed environmental risks.

7 Availability of Documents

The Final WRMP19 and accompanying SEA Environmental Report is available on Thames Water's website at: www.thameswater.co.uk/wrmp

The documents are also available for inspection at Clearwater Court, Reading by appointment. To arrange an appointment please contact us by:

Email to: consultations@thameswater.co.uk
or
By writing to: Lesley Tait, Thames Water, Clearwater Court, Vastern Road, Reading, RG1 8DB

Appendices

Appendix A SEA Post Adoption Procedures

Appendix A SEA Post Adoption Procedures

Part 4 of the Environmental Assessment of Plans and Programmes Regulations 2004 requires Thames Water 'as soon as is reasonably practicable' after the adoption of the WRMP19 to:

1. Make a copy of the WRMP19 and SEA 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 WRMP19;
    - 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 WRMP19 and SEA documents on the Thames Water website and informing all consultees of the publication. The publication of this document fulfils Requirement 4.

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