SESRO
Draft Design Principles

J696-AA-ZZZZ-RP-ZDP100001

June 2024

Contents

List of Figures

List of Tables

Acronyms

Acronym	Term
ACWG	All Company Working Group
CDM	Construction Design and Management
DCLG	Department for Communities and Local Government
DCO	Development Consent Order
GHD	Greenhouse Gas
NIC	National Infrastructure Commission
NSIP	Nationally Significant Infrastructure Project
NPS	National Policy Statement
SESRO	South East Strategic Reservoir Option
SRO	Strategic Resource Option
UKCP18	UK Climate Projections 2018

1 Introduction

1.1 Scope of this report

1.1.1 This report introduces the South East Strategic Reservoir Option project (SESRO) design vision and describes the draft design principles that will underpin the design of the proposed reservoir. The design principles contained in this document mainly apply to design development and the operational phase of the project; in general, they do not apply to the construction phase as any necessary mitigation for that stage will be covered in the code of construction practice.

1.1.2 The design vision is a concise statement that encapsulates Thames Water's ambitions for the project. The purpose of the design vision is to set the strategic direction of our design development, create a framework for our design principles and help external stakeholders and the public understand the aims of the project.

1.1.3 The draft design principles presented in this document will be developed in consultation with local authorities and other stakeholders. The principles establish parameters that must be met in the final detailed design of the project. The principles serve a number of functions:

- They will help to inform the assessment of the likely environmental effects of the project in the environmental impact assessment.
- They demonstrate how sustainability objectives will be implemented in project design.
- They set the parameters for the detailed plans to be prepared by contractors or others to satisfy the Requirements (i.e. conditions) that will be attached to the Development Consent Order (DCO).
- The principles will be considered by the relevant local planning authorities post-consent, alongside the DCO plans, such as landscape plans and site works parameter plans, in assessing the detailed designs submitted for subsequent approval.
- They will help to illustrate how SESRO has responded to public consultation feedback in relation to design.
- They will help to illustrate how SESRO has taken account of the criteria for good design set out in the following documents:
    i. National Infrastructure Commission (NIC) - Design Principles for National Infrastructure[1] (February 2020). An updated version titled Project Level Design Principles – Guidance from the National

[1] NIC-Design-Principles.pdf https://nic.org.uk/app/uploads/NIC-Design-Principles.pdf

Infrastructure Commission Design Group[2] was published in May 2024.

ii. The National Infrastructure Strategy – Fairer, faster, greener[3] (November 2020).

iii. National Policy Statement for Water Resources Infrastructure[4] (April 2023).

iv. All Company Working Group (ACWG) – Water Resources: Design Principles & User Guidance[5] (March 2023).

v. Guidance from the Department for Communities and Local Government[6] (DCLG) - Planning Act 2008: Pre-application stage for Nationally Significant Infrastructure Projects (April 2024).

vi. In addition, Natural England is in the process of developing guidance on preparing design principles specifically for new reservoirs which we will need to take into account when it is published.

1.1.4 The draft design principles and design vision have informed the Interim Landscape and Environmental Master Plan (the Interim Master Plan), which illustrates how the engineering requirements for the proposed reservoir could be integrated with proposed environmental mitigation and potential recreational uses of the site.

1.1.5 This report is structured as follows:

- Section 2 outlines Thames Water's design vision for SESRO.
- Section 3 presents the ACWG high level design principles and how these form the basis for the SESRO design principles.
- Section 4 explains how the Interim Master Plan has split the site into seven zones which have broadly different characteristics. These distinct areas help us to focus design ambitions that may be more relevant to a particular zone.
- Section 5 sets out the SESRO overarching design principles. These represent general project-wide design commitments. However, they must

[2] NIC-Design-Principles-Handbook-Digital-PDF.pdf
[3] NIS_final_web_single_page.pdf (publishing.service.gov.uk)https://assets.publishing.service.gov.uk/media/5fbd810dd3bf7f5736c1a18f/NIS_final_web_single_page.pdf
[4] National Policy Statement for Water Resources Infrastructure (publishing.service.gov.uk) https://assets.publishing.service.gov.uk/media/6437e3a2f4d420000cd4a1a7/E02879931_National_Policy_Statement_for_Water_Resources.pdf
[5] All Company Working Group (2023). acwg-design-principles-methodology-document.pdf (wrse.org.uk)

[6] Planning Act 2008: Pre-application stage for Nationally Significant Infrastructure Projects - GOV.UK (www.gov.uk), *Paragraph 014 Reference ID 02-014-20240430, Published: 30/04/2024.* .

be read in conjunction with the site-specific design principles as they are not necessarily appropriate for each Master Plan zone.

- Section 6 details the site-specific principles. These are contextual principles that are unique to each Master Plan zone, or which elaborate further on the overarching principles.

1.1.6 The principles work in conjunction with the Interim Master Plan drawings. They provide more detail of the design intent but still provide flexibility to develop the detailed designs at a later date in the light of the prevailing circumstances when the project is implemented.

1.2 Next steps for the design principles

1.2.1 The draft design principles are being published in this document for comment by stakeholders. They will be reviewed and updated through the preliminary design development phase of the project as the design itself matures and in response to feedback from stakeholders. They will ultimately be submitted as part of the application for development consent with a view to these being secured through the DCO so subsequent design development, detailed plans and construction must be in accordance with the principles.

2 Design Vision

2.1.1 As noted, the purpose of the design vision is to set the strategic direction of our design development towards DCO, create a framework for our design principles and help external stakeholders and the public understand the aims of the project.

2.1.2 The design vision briefly describes what the project is intended to achieve, what problem it is required to solve, how it will do so, and what benefits it might deliver.

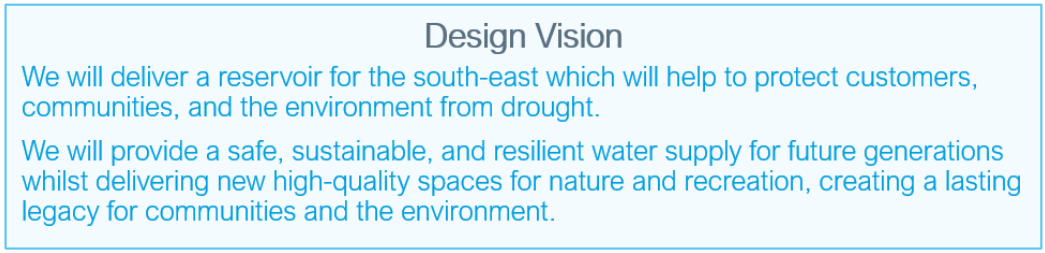
2.1.3 We will revisit our design vision throughout the project and amend it as necessary to ensure it continues to serve its purpose and expresses what we want SESRO to achieve.

2.1.4 Getting our design vision right is important because SESRO provides a unique opportunity to create a lasting positive legacy, both in terms of water security and the quality of the public open space when construction is complete. SESRO is a major regional investment, using customer's money and is a nationally significant infrastructure project (NSIP). OFWAT[7] and the government[8] require promoters of NSIPs to look beyond the boundary of their own project to see how they can add value to wider society.

2.1.5 Figure 1 shows how our design vision leads the strategic direction of our design principles. Our overarching design principles, which are based on the NIC themes of safe and well, climate, people, place and value, draw inspiration from the design vision. Our site specific design principles for each of the seven Master Plan zones shown in Figure 1, provide more specific detail for how the design vision and overarching design principles will be implemented. The design vision sets out our ambition for SESRO, and provides the golden thread which runs through our design principles, and consequently our final design solution.

2.1.6 Thames Water's design vision for SESRO captures the dual purpose of SESRO to both functionally provide long-term water security for the South East of England and also create a place where nature can thrive, and people can enjoy recreation in attractive surroundings for generations to come.

Figure 1: Design Vision



Source: Thames Water Internal

[7] January-2024-Gate-Three-Guidance-Version-3.pdf (ofwat.gov.uk) https://www.ofwat.gov.uk/wp-content/uploads/2024/01/January-2024-Gate-Three-Guidance-Version-3.pdf. Section 2.2.3
[8] National Policy Statement for Water Resources Infrastructure (publishing.service.gov.uk). Sections 4.10 and 4.13

3 ACWG design principles

3.1 Development of Design Principles

3.1.1 Design principles are a means to set out a unified approach to design and give clarity to stakeholders on design intent, objectives and required outcomes, whilst still providing flexibility for the detailed design to be developed. Although they have historically been used on major projects, in 2020 the National Infrastructure Commission (NIC) issued guidance[9] on the use of design principles for National Infrastructure projects around the four themes of Climate, People, Places and Value. The guidance states that *'These principles should guide the projects which will upgrade and renew the UK's infrastructure system. They should be applied to all economic infrastructure: digital communications, energy, transport, flood management, water and waste'.* The use of design principles such as these is supported by Section 3.6 of the National Policy Statement for Water Resources Infrastructure (the NPS).

3.1.2 The ACWG was set up to ensure that water companies with Strategic Resource Options (SROs) were adopting a consistent design approach where possible. In 2023, the ACWG issued guidance to water companies[10] on how they expect design principles to be applied to SRO projects such as SESRO. The ACWG guidance builds on the NIC design principles and reinforce the importance of good design, and include principles associated strongly with landscape and environmental value.

3.1.3 The ACWG guidance advises SRO projects to develop design principles around the following themes:

- 'Be Specific - Develop project-specific design vision and principles based on an understanding of the objectives of each location and the people and places it will affect'.
- 'Safe and Well - Actively and collectively develop designs that can be built, used and maintained without unacceptable risks to the health and safety of workers - particularly during hazardous construction and operational activity. Manage risks to members of the public thoughtfully with an approach that balances maximising wellbeing benefits with protection from risks that could cause significant harm'.
- 'Climate - Mitigate greenhouse gas emissions and adapt to climate change'.
- 'People - Reflect what society wants and share benefits widely'.
- 'Place - Provide a sense of identity and improve our environment'.
- 'Value - Achieve multiple benefits and solve problems well'.

3.1.4 The ACWG design principles are presented below.

Table 1: ACWC design principles

ACWG Ref	Theme	Principle
1	Be specific	Develop project-specific design vision and principles based on an understanding of the objectives of each project and places it will affect
2	Safe and Well	Actively and collectively develop designs that can be built, used and maintained without unacceptable risks to the health and safety of workers - particularly during hazardous construction and operational activity. Manage risks to members of the public thoughtfully with an approach that balances maximising wellbeing benefits with protection from risks that could cause significant harm.
3A	Climate	Nature knows no boundaries: Water is essential to all life and managing our response to climate change is a collective and urgent activity. Projects must be developed to work across companies and/or legislative boundaries to develop sustainable solutions and environmental enhancement for the wider benefit of society.
3B	Climate	Resource and carbon efficient throughout: Projects shall seek to reuse existing assets, eliminate waste (including waste of water) and make efficient use of materials and transport across the whole of the project lifecycle.
3C	Climate	Resilient and adaptable: Design for anticipated future demand at the appropriate scale. Build in the resilience to absorb and recover from the impacts of the extreme events and incremental stresses likely to arise from climate change.
4A	People	Understand and respond to your Community's needs: Develop a full understanding of the social context that will be impacted by the project over its lifecycle. Design for how local communities will encounter the infrastructure in their everyday lives during both construction and operation.
4B	People	Engage widely, early and meaningfully: Work with stakeholders and local communities to develop their understanding of the importance of nature and water conservation. Develop co-design approaches to aspects of the design of infrastructure and associated landscape where practicable.
4C	People	Improve access and inclusion: Consider how people move around your works. Maximise opportunities to support active travel and improve recreational access to waterside and green

ACWG Ref	Theme	Principle
		spaces that can improve outcomes for wellbeing, health, local economy, social inclusion and education
5A	Place	Take care: Develop proposals in the spirit of stewardship looking to both the past and future of each context to understand and develop its landscape, cultural heritage, health and sustainability. Work with partners to secure the long-term success of all measures.
5B	Place	Protect and promote the recovery of nature: Focus on the role of landscape, its capacity to accommodate infrastructure and shape places. Work collaboratively and employ holistic, landscape-scale approaches that support and deliver biodiversity net gain as well as multiple other benefits.
5C	Place	Design all features beautifully, with honesty and creativity: Our utility infrastructure can be a source of pride and a positive contribution to its context. Develop proposals that reveal and celebrate its importance, provide visual delight and leave a positive legacy.
6A	Value	Maximise embedded value: Work collaboratively across specialisms and with stakeholders to maximise the benefits of the scheme by being smart with the location and arrangement of elements and design of mitigation within the project scope and budget.
6B	Value	Understand how you could provide additional value: Identify opportunities to contribute wider regional benefits outside of the project scope. In particular look for synergies with relevant catchment management plans and proposals that support the delivery and enjoyment of a healthy water environment.
6C	Value	Capture and measure embedded and additional value: Have clear narratives about how you are contributing to society beyond the core scope of your project. Quantify these benefits so they can be considered meaningfully in conversations on value, financing and risk. Share your experience and knowledge widely.

Source: ACWG[11]

[11] acwg-design-principles-methodology-document.pdf (wrse.org.uk)

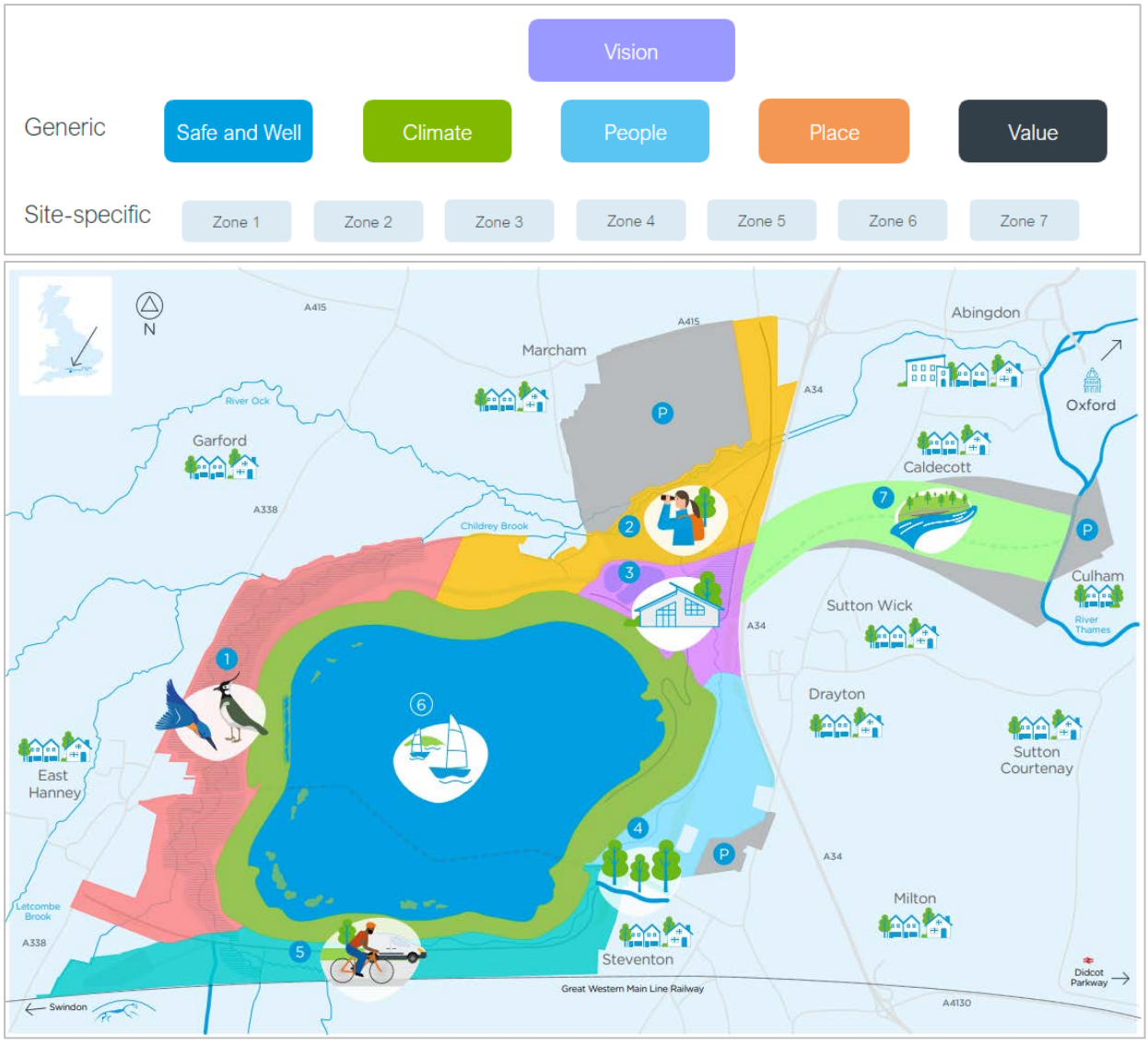
4 Master Plan Zones

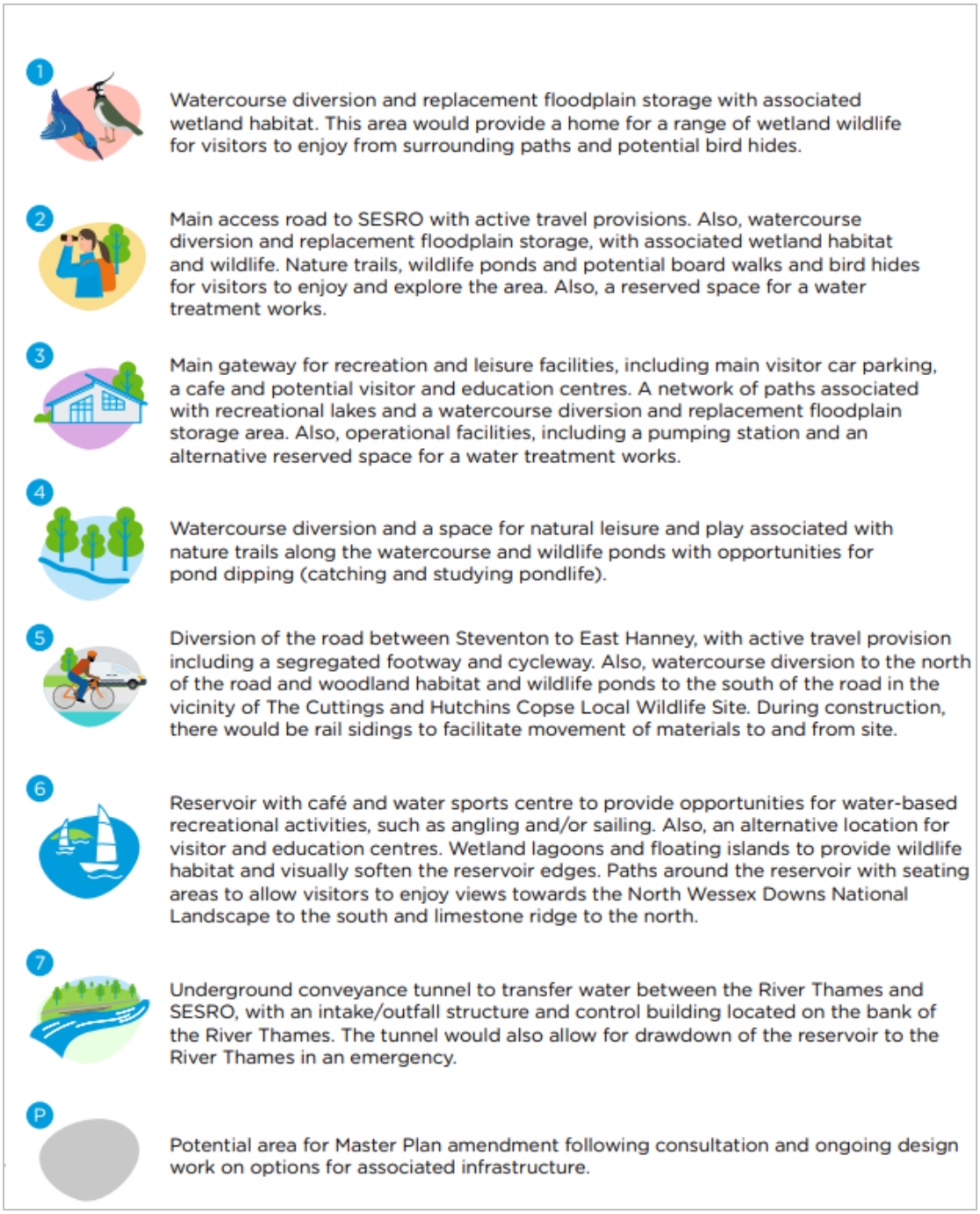
4.1.1 The SESRO Interim Master Plan has been split into seven zones that have broadly different characteristics as shown in Figure 2. Zones P are potential areas for Master Plan amendment following consultation and ongoing design work on options for associated infrastructure. As Interim Master Plan do not incorporate these zones, they are not discussed further in this report.

4.1.2 We have taken the ACWG design principles as a starting point, using the five themes of Safe and Well, Climate, People Place and Value, and developed SESRO specific overarching design principles. We have also developed site-specific principles for the seven Master Plan zones.

4.1.3 Figure 2 shows the relationship between the design vision, the generic design principles and the site-specific principles that area based on the seven Master Plan zones.

Figure 2: SESRO master plan zones





Source: Thames Water Internal

5 SESRO overarching design principles

5.1 Introduction

5.1.1 These design principles have been developed to accompany the early stages of design and, as such, many are aspirational and forward-looking using terms such as “actively explore…” or “consider the need for…”. As we receive feedback from stakeholders on our design proposals and develop our design further, we will develop the design principles to be more precise and those that are finally drafted for inclusion in the application for development consent will be more likely to use terms such as “landscaping shall include…”.

5.2 Safe and well

5.2.1 Safety is at the heart of everything Thames Water does. These principles set out how we want SESRO to be designed, delivered, operated and used to ensure people are kept safe.

5.2.2 The following safe and well principles shall apply, unless stated otherwise at the beginning of each site-specific section.

Table 2: Safe and well overarching design principles

Ref	Principle
2-S1	**The reservoir will be designed to consistently maintain reservoir water quality** during operation.
2-S2	**Reservoir operational infrastructure: Provide reservoir infrastructure which is designed, constructed, commissioned and operated safely**, following international reservoir safety good practice. The design and construction will be supervised by an All Reservoir Panel Construction Engineer (appointed under the Reservoirs Act 1975) with all safety-related design decisions also reviewed by an independent expert panel.
2-S3	**Construction safety will be a key consideration during design development to achieve improved health and safety outcomes.** Consider construction and commissioning safety in design of all associated infrastructure (inlet/outfall, tunnels, roads, rail, landscaping etc). A Principal Designer will be appointed in accordance with Construction (Design and Management) Regulations (CDM) and the design will comply with all relevant safety legislation. Develop and maintain a risk register for the site throughout design development and seek to reduce the identified risks through good design.
2-S4	**Ensuring no increased risk of flooding for local people from rivers, surface and ground water during construction and operation as a result of the project is an integral design consideration for the SESRO design.** Flood replacement storage will be provided in defined areas of the site

Ref	Principle
	and will be designed with safety in mind in accordance with prevailing legislative requirements.
2-S5	**Provide supporting infrastructure and site facilities that are safe to maintain, efficient to operate and resilient.** SESRO infrastructure will be designed with operational simplicity and safety in mind, in accordance with good practice and utilising appropriate available technology and digital tools.
2-S6	**Public areas will be designed sensitively and appropriately to provide access to nature and recreation for improved wellbeing, and with safety of visitors in mind.** The design will enable easy access to walking routes and recreational areas whilst considering water safety and maintaining the necessary security for operational areas.
2-S7	**Acknowledge the power of blue spaces on mental wellbeing and utilise water (including moving water) to engage the senses**. Water will be at the heart of the visitor experience.
2-S8	**Consider the need for lighting for safety along new recreational routes** alongside environmental constraints, such as the effect on the night sky and biodiversity, and in accordance with prevailing good practice and local guidance for highways and Public Rights of Way.

Source: Thames Water Internal

5.3 Climate

5.3.1 The projected impact of climate change in our region will add to a difficult situation where water resources are already stressed, and the population is increasing. We believe reducing our greenhouse gas (GHG) emissions and managing the impacts of climate change is essential.

5.3.2 In delivering SESRO, we want to ensure that we protect water resources, deliver a resilient project which is adaptable to climate change, support Thames Water's carbon commitments, use resources efficiently and minimise waste, and enhance the environment.

5.3.3 The following climate principles shall apply, unless stated otherwise at the beginning of each site-specific section.

Table 3: Climate overarching design principles

Ref	Principle
3-S1	**Actively seek to prevent and minimise whole-life carbon emissions at every stage of project development and support water industry operational net zero ambitions.** Seek opportunities to reduce embodied and operational carbon following the carbon management hierarchy such as investing in low carbon solutions, increasing energy efficiency and incorporating carbon sequestration on site, where possible.
3-S2	**Actively explore whether there are any aspects of our designs that can enable our supply chain to reduce climate impacts during construction.** Work with other water companies and our supply chain to explore ways to integrate benefits with other projects in the area and wider industry.
3-S3	**Actively explore whether there are any aspects of our designs that can enable our customers and the wider public to reduce climate impacts during the operation and use of SESRO**.
3-S4	**Aim to reuse all excavated material on site**. The SESRO design is based on using clay excavated on site for reservoir construction and reusing excavated material on site for landscape fill and other beneficial uses where practicable, thereby minimising waste and off-site disposal. Soils suitable for re-use (including topsoil) will be managed and stored appropriately for reuse in the final landscape scheme.
3-S5	**Actively seek to use resources efficiently and avoid waste**. Specify low carbon, sustainable and responsibly sourced materials where reasonably practicable and consider end of life disassembly, repurposing and re-use of temporary works.
3-S6	**All aspects of the project, including water management, landscaping, recreation and habitat creation will be designed for climate resilience.** Explore incorporation of adaptation measures and pathways to address the effects of climate change (such as longer growing seasons, heatwaves, drought and other extreme weather events), based on available long-term projections of future climatic conditions, such as UK Climate Projections 2018 (UKCP18).

Source: Thames Water Internal

5.4 People

5.4.1 Our vision is that SESRO will not only provide long term water security for the South-East, but it will also leave a lasting positive legacy for the communities in the area. We want to minimise the construction impact on people living nearby and design the reservoir to be accessible for communities to and use for recreation and relaxation.

5.4.2 The following people principles shall apply, unless stated otherwise at the beginning of each site-specific section.

Table 4: People overarching design principles

Ref	Principle
4-S1	**Develop a project that engages the local population and organisations during the construction period and seeks to foster a long term sense of ownership**. To include exploring how to enable employment opportunities for local people in both the construction and operational stages.
4-S2	**Develop an inclusive, accessible and multifunctional recreational facility for local people and visitors, that will provide opportunities for recreational activities in nature, which contribute to improved quality of life**. Seek to encourage recreational activities that will improve fitness, health and mental wellbeing of visitors and people in local communities.
4-S3	**Seek to encourage active travel and use of public transport as part of the long term legacy for SESRO**. Ensure that there are safe and car-free or segregated access routes for walkers, and cyclists incorporated as part of the project. Also engage with the Vale of White Horse District Council and Oxfordshire County Council to identify opportunities to support travel connections outside the SESRO site to enable people in surrounding communities to use active travel routes to visit SESRO.
4-S4	**Reduce construction impacts on the local communities and transport network as far as reasonably practicable through design**. Considering impacts on noise, dust and visual amenity, adhering to good practice principles to be set out in a Code of Construction Practice. Develop plans that locate site entrances away from the local villages to the extent possible and maximise the use of the railway to minimise movements by roads as far as reasonably practicable, proposing noise and visual screening near local communities adjacent to the SESRO site and reusing materials on site.
4-S5	**The design shall seek to connect buildings on the site via active travel routes and commonality in architectural style and seek to provide interesting and 'unique' moments throughout the site to encourage exploration and engagement.**
4-S6	**Aim to minimise noise from the fully developed site to nearby sensitive receptors by considered siting of recreational hubs and operational areas.**
4-S7	**Propose new foot, cycleways and bridleways to improve recreational access within the area, including connectivity between SESRO and local communities. Where practicable, retain and enhance the existing public rights of way network.**
4-S8	**Develop good wayfinding signposts and colour-coded mapping of recreational routes to help people navigate the SESRO site.**
4-S9	**Maintain connectivity of public rights of way throughout construction, as far as reasonably practicable.**

Source: Thames Water Internal

5.5 Place

5.5.1 We want to design the reservoir to blend sensitively into the landscape, mindful of its rural context, proximity to local villages and the North Wessex Downs National Landscape. We want to create valuable new habitats for nature, and when buildings are required, construct them so that they enhance the landscape. Our vision is to create a high-quality space for nature and recreation, creating a lasting legacy for communities and the environment.

5.5.2 The following place principles shall apply, unless stated otherwise at the beginning of each site-specific section.

Table 5: Place overarching design principles

Ref	Principle
5-S01	Develop a Master Plan that considers the impact of SESRO on the character of the low lying Vale, floodplain and limestone ridge, and is sensitive to the setting of the North Wessex Downs National Landscape , in particular the panoramic views across the Vale towards the limestone ridge, and to integrate the reservoir into the local landscape and enhance local landscape characteristics as far as practicable.
5-S02	Develop a design that seeks to achieve environmental net gain requirements, to increase biodiversity and leave the natural environment in a better state through creation of new terrestrial and aquatic habitats, giving these space to function naturally, as well as enhancement of existing habitats to be retained. This should be achieved within the SESRO site or otherwise locally, as far as reasonably practicable.
5-S03	Develop a strong sense of identity for SESRO that provides a biodiverse and visually attractive landscape for people, that is well integrated and is sympathetic to the local landscape character. This could include varying the embankment profile and softening views of the reservoir as far as reasonably practicable.
5-S04	Explore opportunities to enhance the green infrastructure network locally by working with local organisations to seek to integrate the SESRO site into the wider environment and help to facilitate local and regional green infrastructure initiatives.
5-S05	The design shall seek to retain valuable landscape and habitat features across the site where reasonably practicable. Native species shall generally be used to promote new habitat creation.
5-S06	Develop new habitats that seek to maintain and improve habitat connectivity across the SESRO site, where reasonably

Ref	Principle
	practicable, to reduce any potential fragmentation of habitats and to accommodate the movement of protected species.
5-S07	Ensure sensitive positioning and/or high-quality design of all buildings, associated structures and other infrastructure, such as reservoir towers and pump houses, so that these would not draw the eye in views from the scarp of the North Wessex Downs to the south or limestone ridge to the north as far as reasonably practicable. This would include careful use of materials and colours that are visually recessive and appropriate to the local landscape character and setting of the North Wessex Downs National Landscape, avoiding the use of reflective materials and referring to the Guidance on the selection and use of colour in development (Waygood Colour for North Wessex Downs Area of Outstanding Natural Beauty, 2020[12]).
5-S08	Seek to reduce the spread of Invasive Non-Native Species through good design and other mitigation facilities, such as boat washing.
5-S09	Ensure sensitive design of the reservoir in order to limit the impact of light and noise on the tranquillity and dark night skies of the scarp and footslopes of the North Wessex Downs, as well as the wider setting of the North Wessex Downs National Landscape as far as reasonably practicable.
5-S10	Reserve space for the Wiltshire and Berkshire Canal Trust's aspiration for the future diversion and rebuilding of the Wiltshire and Berkshire Canal as a recreational waterway within the landscape surrounding the proposed reservoir.
5-S11	Retain existing woodland, trees and hedgerows that are in good condition as far as reasonably practicable and incorporate new woodlands, trees and hedgerows in the landscape surrounding the proposed reservoir to help compensate for loss of such features, as far as reasonably practicable.
5-S12	Retain and restore field patterns around the reservoir, where reasonably practicable, with new hedgerow and tree planting along field boundaries, making reference to the Oxfordshire Historic Landscape Characterisation and historic maps.

[12] Waygood Colour for North Wessex Downs AONB (2020). North Wessex Downs Area of Outstanding Natural Beauty Guidance on the selection and use of colour in development. Available at: https://www.northwessexdowns.org.uk/wp-content/uploads/2021/11/WD_guidance_screen.pdf. Accessed May 2024.

Ref	Principle
5-S13	Conserve existing views and allow new views towards the North Wessex Downs National Landscape and limestone ridge, as far as reasonably practicable. Consider designing new views framed by woodland, looking towards the scarp of the North Wessex Downs, as part of SESRO, in order to reflect the character of the wider lower Vale farmland.
5-S14	Seek to sensitively design new bridges and culverts associated with watercourse crossings, such as consideration of clear span bridges over the River Ock.
5-S15	Where utility diversions are required, if reasonably practicable, seek to place them underground in order to reduce the presence of detracting pylons and overhead wires in the landscape.
5-S16	Seek to incorporate public art into the Master Plan to celebrate and enhance the local, natural, and cultural history. This could be included as part of the design of benches, cycle racks, bins, signposts, paving and walls.
5-S17	Monitoring equipment shall be designed to be as unobtrusive and sensitive to the surrounding landscape context, as far as reasonably practicable.
5-S18	Consider options to retain or relocate ancient, veteran and notable trees. Where removal is unavoidable, mitigation or compensation measures could be undertaken in accordance with good practice guidance on ancient woodland, ancient trees and veteran trees. For example, relocating the intact dead wood hulks to a nearby woodland area to decompose naturally, and taking cuttings and planting within the indicative location for SESRO.

Source: Thames Water Internal

5.6 Value

5.6.1 Promoters of nationally significant infrastructure projects such as SESRO are asked to look for opportunities to maximise the value of major infrastructure investment to wider society in guidance documents referred to in sections 1.1.2 and 2.1.2. This includes looking for opportunities to work together with other major projects to reduce overall impact and delivering a project that has lasting positive benefit to communities and the environment.

5.6.2 The following value principles shall apply, unless stated otherwise at the beginning of each site-specific section.

Table 6: Value overarching design principles

Ref	Principle
6-S1	**Seek to facilitate or deliver multi-sector or non-public water supply benefits**. Create opportunities to deliver multiple benefits from the SESRO site by actively engaging with stakeholders and leveraging the multi-disciplinary expertise of our supply chain.
6-S2	**Seek out synergies and opportunities to integrate with other infrastructure projects that are being developed in the local area and wider region**. Bring together experts across different technical areas to create a shared understanding between different projects and disciplines, enabling resolution of multiple problems at once, providing multiple benefits and a more efficient design process. Identify dependencies and synergies between SESRO and other water resource and SRO schemes.
6-S3	**Use digital tools to drive efficiency in project development and delivery.** Use technology to encourage collaboration within the project team and support discussions with stakeholders throughout the development of the scheme design.

Source: Thames Water Internal

6 Site-specific design principles

6.1 Zone 1

Table 7: Zone 1 specific design principles

Theme	Ref.	Principle
Safe and Well	2-Z1-1	The design will enable safe, easy access to walking routes whilst considering water safety, and will provide access to nature and recreation for improved wellbeing.
Climate	3-Z1-1	Consider projected climate in the design of flood storage and environmental systems to increase resilience to pressures such as drought, heatwaves and high rainfall.
People	4-Z1-1	Develop the design to be sensitive to the nearby South Oxfordshire Crematorium, located near the north-east corner of this zone.
People	4-Z1-2	Develop the design in this zone for quiet recreational activities, such as bird watching.
Place	5-Z1-1	Create space for water through the development of an extensive array of new river, stillwater and wetland habitats of value to plants, animals, waterfowl and other birds. Other existing habitats will also be enhanced to provide an overall net gain for biodiversity.
Place	5-Z1-2	The new western watercourse diversion will be designed to reflect the natural meandering pattern of local watercourses; incorporate a stillwater and wetland habitat mosaic including waterside woodland and tree belts with willow and poplar; and design landform changes for optimised water levels sensitively, when designing new watercourse diversions, associated ditches and replacement floodplain storage.
Place	5-Z1-3	Propose tree planting, including willow, along some of the new watercourse diversions and ditches.
Place	5-Z1-4	Enhance existing hedgerows to be retained that are in poor condition including, for example, planting where gaps are present, and propose new species-rich hedgerows to include locally characteristic species such as hawthorn and blackthorn, to compensate for loss of existing hedgerows.
Place	5-Z1-5	Ensure sensitive design of features that would introduce lighting, noise and traffic movement to the Vale as far as reasonably practicable, in order to limit the impact on the setting of East Hanney Conservation Area.
Value	6-Z1-1	Integrate replacement floodplain storage and watercourse diversions to deliver high quality naturalised river and wetland habitats and enhance ecological value on the western side of the reservoir.

Source: Thames Water Internal

6.2 Zone 2[13]

Table 8: Zone 2 specific design principles

Theme	Ref.	Principle
Safe and Well	2-Z2-1	Design to minimise interaction between vehicles and other users accessing the site.
Climate	3-Z2-1	Consider projected climate in the design of the access road to improve resilience of the project to the impacts of climate change such as heatwaves and intense rainfall events.
People	4-Z2-1	Create a well designed and inviting gateway into the reservoir landscape for visitors, with good signposting to amenities and considered design of buildings and other hard infrastructure.
People	4-Z2-2	Create small seating and gathering areas along new recreational routes within short walking distance of the visitor centre, as well as areas for quiet recreational activities, such as bird watching, further away from the visitor centre.
Place	5-Z2-1	Seek to keep the alignment of the site access road close to the A34 highway corridor in order to reduce the effect of traffic and highway infrastructure on the landscape.
Place	5-Z2-2	Create space for water through the development of a new river, stillwater and wetland habitats of value to plants, animals, waterfowl and other birds and enhance existing habitats to provide an overall net gain for biodiversity.
Place	5-Z2-3	The new eastern watercourse diversion and associated ditches will be designed to reflect the natural meandering pattern of local watercourses; and incorporate a stillwater and wetland habitat mosaic including waterside woodland and tree belts with willow and alder.
Place	5-Z2-4	Enhance existing hedgerows to be retained that are in poor condition including, for example, planting where gaps are present, and propose new species-rich hedgerows to include locally characteristic species such as hawthorn, to compensate for loss of existing hedgerows.
Place	5-Z2-5	Propose tree planting along some of the new watercourse diversions and ditches, to reflect the existing characteristic trees silhouetted against the skyline.
Place	5-Z2-6	Reflect the characteristic pattern of wide grass verges, ditches and hedgerows, including standard trees, along new foot and cycleways.
Value	6-Z2-2	Seek to integrate access to the site with access to Dalton Barracks allocated housing development site, as far as reasonably practicable.

Source: Thames Water Internal

[13] Zone 2 may include a water treatment works (WTW), subject to the outcome of consultation and further design development. If a WTW is required in Zone 2, additional design principles will be added

6.3 Zone 3

Table 9: Zone 3 specific design principles

Theme	Ref.	Principle
Safe and Well	2-Z3-1	Sensitively segregate operational and recreational areas for safety and security, recognising the need for private and public spaces.
Climate	3-Z3-1	The design shall seek to include a hydroturbine for renewable power generation when water is discharged from the reservoir to the River Thames.
Climate	3-Z3-2	Consider projected climate in design of the pumping station (structures, technology etc.) to increase resilience to the impacts of climate change, such as heatwaves, floods and droughts.
Climate	3-Z3-3	Design the buildings and facilities to be energy efficient and incorporate low carbon and sustainable materials where reasonably practicable.
People	4-Z3-1	Design the site and appropriate facilities for all ages and abilities and optimise educational opportunities in all design elements.
People	4-Z3-2	The main visitor entrance point to the site should seek to create an attractive, accessible and multifunctional hub for visitors coherently linking facilities which are flexible and open to everyone alongside site information such as a sightings board, trails and maps.
People	4-Z3-3	Consider views from the visitor centre to seek to create a connection with the landscape and the wildlife and habitats within the surroundings. The design should be contextually sensitive, allowing visual connection to the natural surroundings.
Place	5-Z3-1	Propose high quality building designs that are contextually sensitive and recognise the significance of the infrastructure.
Place	5-Z3-2	The new eastern watercourse diversion and associated ditches will be designed to reflect the natural meandering pattern of local watercourses; and incorporate waterside woodland and tree belts with species such as willow, alder and individual waterside trees to reflect the existing characteristic trees silhouetted against the skyline.
Place	5-Z3-3	Enhance existing hedgerows to be retained that are in poor condition including, for example, planting where gaps are present, and propose new species-rich hedgerows to include locally characteristic species such as hawthorn, to compensate for loss of existing hedgerows.
Place	5-Z3-4	Along new foot and cycleways, reflect the characteristic pattern of wide grass verges, ditches and hedgerows with standard trees.
Place	5-Z3-5	Create space for water through the provision of a new watercourse and wetland corridor to the eastern side of the reservoir.
Value	6-Z3-1	Settlement ponds are needed during construction. Explore opportunities to repurpose these as part of the legacy of SESRO.

Source: Thames Water Internal

6.4 Zone 4

Table 10: Zone 4 specific design principles

Theme	Ref.	Principle
Safe and well	2-Z4-1	Consider the most appropriate design solution to work around existing utilities including overhead electric powerlines, the existing electricity substation and other underground utilities.
Climate	3-Z4-1	Consider projected climate in design of landscaping and vegetation selection to improve resilience to the impacts of climate change such as heatwaves and flooding. Seek to enhance tree cover to provide refuge from high temperatures.
People	4-Z4-1	Landscape design to consider the relationship between the Steventon community and the site and seek to deliver a new local recreational resource and enhanced landscape context such as screening in the vicinity of the existing substation.
Place	5-Z4-1	The new eastern watercourse diversion and associated ditches will be designed to create a new wetland corridor, reflecting the natural meandering pattern of local watercourses; and incorporate waterside woodland and tree belts with willow and alder and individual waterside trees to reflect the existing characteristic trees silhouetted against the skyline.
Place	5-Z4-2	Enhance existing hedgerows to be retained that are in poor condition including, for example, planting where gaps are present, and propose new species-rich hedgerows to include locally characteristic species such as hawthorn, to compensate for loss of existing hedgerows.
Place	5-Z4-3	Along new foot and cycleways, reflect the characteristic pattern of wide grass verges, ditches and hedgerows, with standard trees.
Place	5-Z4-4	Seek to create a new woodland within the SESRO site to link with the Steventon community woodland in the adjacent landscape to the east.
Place	5-Z4-5	Develop new river and wetland habitats of value to waterfowl, other birds and animals and enhance existing habitats to provide an overall net gain for biodiversity.
Value	6-Z4-1	Add value by integrating part of the Thames to Southern Transfer project pipeline within the SESRO construction plan, thereby minimising the construction impact and associated carbon emissions.

Source: Thames Water Internal

6.5 Zone 5

Table 11: Zone 5 specific design principles

Theme	Ref.	Principle
Safe and well	2-Z5-1	Hanney Road diversion will be designed and constructed with safety as a priority in consultation with the local highways authority. Construction of the highway will be sequenced to ensure connectivity between Steventon and East Hanney is maintained throughout the construction period and safe methods for construction traffic to cross over will be implemented.
Climate	3-Z5-1	Consider projected climate in design of the road, cycle route and rail siding to improve resilience of these assets to the impacts of climate change such as heatwaves and flooding.
People	4-Z5-1	Where reasonably practicable, use the east-west transport corridor, connecting Steventon and East Hanney, to facilitate safe, segregated and attractive travel options for all travellers such as walkers, cyclists and horse-riders, and facilitating access for public transport routes.
People	4-Z5-2	Work with local organisations and stakeholders to plan active travel routes into the site for local communities and connectivity with existing footpaths, bridleways and cycle routes.
Place	5-Z5-1	Enhance existing hedgerows to be retained that are in poor condition, including, for example, planting where gaps are present and the addition of standard tree planting, where this is not already present.
Place	5-Z5-2	Consider extending the existing woodland belt to the north of the Great Western Main Line railway and/or planting new copses within fields.
Place	5-Z5-3	Retain the associated waterside tree belts along the route of the old Wiltshire and Berkshire Canal and meandering Cow Common Brook in the vicinity of The Cuttings and Hutchin's Copse Local Wildlife Site as far as reasonably practicable.
Place	5-Z5-4	Propose new characteristic features, such as woodland blocks to enhance the landscape character and screening effect of woodland belts along the railway.
Place	5-Z5-5	The new eastern watercourse diversion and associated ditches will be designed to reflect the natural meandering pattern of local watercourses; and incorporate waterside woodland and tree belts.
Place	5-Z5-6	Create space for water through the provision of a new watercourse and wetland corridor to the southern side of the reservoir.
Place	5-Z5-7	Develop new river and wetland habitats of value to waterfowl, other birds and animals and enhance existing habitats to provide an overall net gain for biodiversity.

Theme	Ref.	Principle
Place	5-Z5-8	Design the temporary rail sidings and other associated infrastructure to seek to conserve The Cuttings and Hutchin's Copse Local Wildlife Site and seek opportunities to enhance where reasonably practicable.
Value	6-Z5-1	A temporary rail siding is likely to be required during construction. Explore opportunities to either repurpose the rail siding and materials handling area in situ as part of the legacy of SESRO or enable ease of decommissioning and potential reuse of materials resulting from the decommissioning works.

Source: Thames Water Internal

6.6 Zone 6

Table 12: Zone 6 specific design principles

Theme	Ref.	Principle
Safe and Well	2-Z6-1	Safety of water users will be a core design consideration.
Safe and Well	2-Z6-2	Ensure the design of all recreational facilities takes account of the expected operational fluctuation in water level within the reservoir, so it remains safe to use for a wide range of operational conditions.
Climate	3-Z6-1	Consider projected climate in design of public realm and recreational areas to improve resilience of the assets and their users to the impacts of climate change such as heatwaves and flooding.
People	4-Z6-1	Design the public realm and recreational areas around the reservoir to maximise access to water for all social groups and individuals where safe and practicable.
People	4-Z6-2	Consider zoning on the water to reduce conflicts between different activities and disturbance to wildlife.
People	4-Z6-3	Utilise level changes on the embankments to provide multiple walking routes and offer new vistas and perspectives for visitors to celebrate the journey around the site.
Place	5-Z6-1	Where reasonably practicable and compliant with safety and security requirements for the reservoir, 'soft' engineering solutions should be used in preference to 'hard', softening the edges of the reservoir with planting, varying the height of the embankment crest, softening the gradients and profile of the outer embankment and exploring opportunities for planting, to seek to blend the embankments into the existing landscape and provide slopes with a natural appearance.
Place	5-Z6-2	Consider options to incorporate planting within the reservoir water surface, such as floating islands, to create additional

Theme	Ref.	Principle
		ecological benefits, help to provide visual breaks in the surface and reflect the pattern of small woodland blocks within the Vale landscape.
Place	5-Z6-3	Consider incorporating small woodland copses and gentle undulations on the south-facing reservoir embankment to help to integrate the reservoir embankment into the landscape when seen from the scarp and footslopes of the North Wessex Downs National Landscape looking across the Vale landscape, towards the largely wooded limestone ridge.
Place	5-Z6-4	Design new views and new vantage points looking from the SESRO site towards the scarp of the North Wessex Downs National Landscape to the south and limestone ridge to the north.
Place	5-Z6-5	The reservoir toe drain will be designed to be an open aquatic habitat with diverse marginal habitats where reasonably practicable.
Value	6-Z6-1	Seek to provide lasting local and regional benefits by creating multiple opportunities for water-based recreation.

Source: Thames Water Internal

6.7 Zone 7

Table 13: Zone 7 specific design principles

Theme	Ref.	Principle
Safe and Well	2-Z7-1	Design intake and outfall structure to ensure the safety of the public (i.e., river users and public on land), including security fencing and intake/outfall protection, as appropriate.
Climate	3-Z5-1	Consider projected climate in the design of structures such as the tunnel and intake-outfall to improve resilience to the impacts of climate change such as flooding, drought and subsidence.
People	4-Z7-1	Develop the design to limit visual effects on the nearby community in Drayton, Abingdon and Culham as far as reasonably practicable.
Place	5-Z7-1	Design the intake and outfall structures sensitively to seek to conserve the relative sense of tranquillity and remoteness along the River Thames, and the visual amenity of the Thames Path National Trail to the east of the river.
Place	5-Z7-2	Incorporate new tree belts, thick hedgerows and trees, such as willow, poplar and alder in conjunction with new features to help to integrate the intake and outfall structure into the landscape and reflect the character of riparian vegetation along the River Thames.
Place	5-Z7-3	Enhance existing hedgerows to be retained where they are in poor condition, including planting where gaps are present.
Place	5-Z7-4	If watercourse diversions or replacement are needed for the Oday ditch network then these will be designed to deliver high quality watercourse and/or ditch habitat through naturalised design.
Place	5-Z7-5	Operation on the intake and outfall from SESRO will be regulated to meet licensing requirements and seek to protect the River Thames ecology.
Value	4-Z7-1	Explore opportunities for new foot and cycleways to improve recreational access within the area, such as including new links with National Cycle Network Route 5 and the Vale Way Long Distance Path.

Source: Thames Water Internal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