

AffinityWater



# SESRO

## Interim Landscape and Environmental Master Plan Report

AJ96-AJ-A02X-ZZZZ-RP-EN-100010

June 2024

## Notice

This document has been produced to support the public consultation on key infrastructure options, draft Design Principles and an Interim Master Plan for the South East Strategic Reservoir Option and to inform scoping of the environmental impact assessment. The information presented represents the current stage of the project design. It comprises material or data which is still in the course of completion, pending consultation, engagement and further design and technical development.

## Contents

Executive Summary .....	9
1 Introduction .....	12
2 Key Components of the Master Plan.....	16
2.1 Indicative Master Plan 2022 .....	16
2.2 Updates to the Key Components of the Interim Master Plan since Gate 2 .....	17
3 Master Plan Design Development Process .....	23
3.2 Design Development Process.....	23
3.3 Landscape and Environment Led Approach to Master Plan Development .....	24
3.4 Development of Design Vision and Design Principles .....	28
3.5 Approach to Biodiversity Net Gain .....	30
4 Master Plan Zoning .....	33
4.2 Zone 1 .....	33
4.3 Zone 2 .....	34
4.4 Zone 3 .....	35
4.5 Zone 4 .....	35
4.6 Zone 5 .....	36
4.7 Zone 6 .....	36
4.8 Zone 7 .....	37
4.9 Zones P .....	37
5 Summary of Interim Master Plan Design Development .....	38
5.2 Zone 1 .....	38
Western watercourse and ditch diversions.....	38
Corridor for future canal diversion .....	38
Car parking.....	38
Landscape and biodiversity habitat design .....	39
Recreational provisions .....	39
5.3 Zone 2 and 3 .....	40
Main access road/SESRO 'gateway' .....	40
Eastern watercourse and ditch diversions.....	41

Emergency discharge arrangement.....	42
Siting of SESRO and potential future STT operational infrastructure .....	42
Allocation of space for water treatment works.....	43
Corridor for future canal .....	43
Siting of recreational buildings and facilities .....	43
Car parking.....	44
Environmental bunding.....	45
Landscape and biodiversity habitat design .....	45
5.4 Zone 4 .....	46
Eastern watercourse and ditch diversions.....	46
Environmental bunding.....	47
Landscape and biodiversity habitat design .....	47
5.5 Zone 5 .....	48
Steventon to East Hanney road diversion .....	48
Recreational provisions .....	49
Car parking.....	49
Environmental bunding.....	50
Eastern watercourse and ditch diversions.....	50
Landscape and biodiversity habitat design .....	51
5.6 Zone 6 .....	52
Shape of the reservoir waterbody.....	52
Sub-division of the reservoir for recreation and biodiversity habitat.....	52
Floating islands .....	53
Reservoir towers .....	54
Renewable energy .....	55
Internal edges of reservoir water body.....	55
Wetland lagoons .....	56
Buildings and ancillary infrastructure on the reservoir embankment.....	57
Car parking.....	58
Embankment earthworks design.....	58
Embankment toe drain .....	59



	Landscape and biodiversity habitat design of reservoir embankment .....	60
5.7	Zone 7 .....	61
	Intake/outfall structure and control building.....	61
	Conveyance Tunnel and Emergency discharge arrangement.....	62
	Landscape and biodiversity habitat design .....	62
6	Biodiversity Net Gain Analysis and Results .....	63
6.2	Limitations and Assumptions .....	63
	Baseline.....	63
	Habitat retention and creation .....	64
6.3	BNG Results: Interim Master Plan with Below Ground Emergency Discharge Tunnel .....	65
	Overall BNG Results .....	65
	Baseline Calculations .....	65
	Habitat Loss.....	65
	Retained and Enhanced Habitats .....	65
	Habitat Creation.....	66
	Hedgerow Loss.....	66
	Retained and Enhanced Hedgerows.....	66
	Hedgerow Creation.....	67
	Watercourses .....	67
6.4	Trading Rules.....	67
6.5	Loss of Irreplaceable Habitats .....	68
6.6	Summary .....	69
7	Summary and Next Steps.....	71
7.1	Summary .....	71
7.2	Next steps for engagement on the Master Plan.....	71
7.3	Further key actions for Master Plan design development .....	76
7.4	Other actions for further design and consenting stages .....	80

Appendix A Interim Master Plan Design Development Process.....	81
Appendix B Feedback on Reservoir Design and Key Issues from Natural England on behalf of SESRO Landscape and Visual Technical Liaison Group .....	93
Appendix C Access and Security Requirements.....	94
Appendix D Interim Landscape and Environmental Master Plan with Below Ground Emergency Discharge Tunnel .....	97
Appendix E Interim Landscape and Environmental Master Plan Cross Sections...	98
Appendix F Indicative Master Plan 2022 .....	99

## Figures and Tables

Figure 3.1: Multi-disciplinary Design Development Process .....	23
Figure 3.2: Interim Master Plan Design Development Process up to March 2024.....	27
Figure 4.1: Master Plan Zones .....	33
Figure A.1: Interim Master Plan Design Development Process up to March 2024 .....	82
Figure A.2: Overview of Appraisal Methodology .....	85

Table 2.1: Summary of changes to the key components and assets in the Interim Master Plan .....	19
Table 7.1: Summary of feedback on the Master Plan design development received as part of the community survey and workshops in February and March 2024 .....	72
Table 7.2: Summary of further key actions for Master Plan design development .....	77

## Acronyms

Acronym	Term
ACWG	All Company Working Group.
ADC	Auxiliary drawdown channel.
BNG	Biodiversity net gain.
CAR	Conservation, access and recreation.
CCTV	Closed-circuit television.
CTA	Conservation Target Area.
DCO	Development Consent Order.
Defra	Department for Environment Food & Rural Affairs
DLL	District Level Licensing.
EIA	Environmental impact assessment.
GCN	Great crested newt.
IEMA	Institute of Environmental Management and Assessment.
LCA	Landscape character area.
LCT	Landscape character type.
LMDW	Lowland Mixed Deciduous Woodland.
LNRS	Local Nature Recovery Strategy.
LWS	Local Wildlife Site.
MoRPh	Modular River Physical Habitat.
NIC	National Infrastructure Commission.
NSIP	Nationally Significant Infrastructure Project.
PRoW	Public rights of way.
RAPID	Regulators' Alliance for Progressing Infrastructure.
SESRO	South East Strategic Reservoir Option.
SRO	Strategic Resource Option.
STT	Severn Thames Transfer.
STW	Sewage Treatment Works.
SWOX	Swindon and Oxfordshire.
TLG	Technical liaison group.

Acronym	Term
T2ST	Thames to Southern Transfer.
UKHab	UK Habitat Classification.
WFD	Water Framework Directive.
WRMP	Water Resource Management Plan.
WRSE	Water Resources South East.
WTW	Water treatment works.

## Executive Summary

In October 2022, Thames Water made a Gate 2<sup>1</sup> submission for the South East Strategic Reservoir Option (SESRO) to the Regulators' Alliance for Progressing Infrastructure Development (RAPID). The main report<sup>2</sup> included an indicative landscape and environment led Master Plan figure, hereafter referred to as the Indicative Master Plan 2022. This was included to illustrate how the engineering requirements for the project could be integrated with the expected requirements for environmental mitigation and potential recreational uses of the site.

Since Gate 2, alongside optioneering and design development work, Thames Water has held community information events, engaged with regulators and technical stakeholders through technical liaison groups (TLGs) and undertaken one-to-one consultee engagement. The feedback received as part of this engagement in 2023 has been taken on board in developing the Master Plan, ahead of further consultation, feedback and design iteration programmed during 2024 and 2025. Feedback received as part of engagement during the first part of 2024, such as initial workshops held in February 2024 with smaller groups of recreational and environmental stakeholders and other interested parties, is summarised in this report. As these workshops were aimed at identifying initial issues for further engagement, the feedback will be taken on board in the next iteration of the Master Plan development, once the project team have had the opportunity to engage and explore the feedback further.

This report summarises the key features of the Indicative Master Plan 2022 and documents the Master Plan design development process by the multi-disciplinary project team since Gate 2 up to the end of March 2024. It also provides an Interim Landscape and Environmental Master Plan update (hereafter referred to as the Interim Master Plan) to support the non-statutory public consultation on SESRO in summer 2024. The Master Plan design development has been undertaken on the basis that the location and, broadly, the overall shape and position of the proposed reservoir are as

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<sup>1</sup> The RAPID 'gated process relates to the funding of investigations and development of water resource solutions... There are four gates...' Gate 2 is the second gate and was focussed on 'investigation and development of solutions' that aligned with water resource management planning.

Ofwat (2023). The RAPID gated process and the proposed water resource solutions. Online. Available at: <https://www.ofwat.gov.uk/regulated-companies/rapid/the-rapid-gated-process/>. Accessed May 2024.

<sup>2</sup> Thames Water (2022). Strategic regional water resource solutions: detailed feasibility and concept design. Standard Gate two submission for South East Strategic Reservoir Option (SESRO). Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/SESRO-Gate-2-Main-Report-FINAL.pdf>. Accessed May 2024.

determined through the Water Resource Management Plan<sup>3</sup> (WRMP) and constraints assessment (see Chapter 2 in document J696-DN-A01A-ZZZZ-RP-ZD-100006). This report should be read together with the five option appraisal reports (refer to documents J696-DN-A01A-ZZZZ-RP-ZD-100006 to J696-DN-A01A-ZZZZ-RP-ZD-100010), which explain the optioneering process that has been undertaken for key infrastructure components in order to determine the preferred configuration of the project. This report addresses steps 7 and 8 of the optioneering methodology (see document (J696-DN-A01A-ZZZZ-RP-ZD-100006), comprising confirmation that there are no conflicts between preferred key infrastructure options (7) and master planning to inform non-statutory public consultation (8).

A landscape and environment led approach has been taken to the continued Master Plan design development. This approach is based upon good contextual design and collaboration, in order to ensure that the design is sensitive to the surrounding context, well integrated into the landscape and contributes to the delivery of benefits for landscape, nature and people. Updates to the Master Plan have been made in response to:

- Multi-disciplinary options appraisals and internal design workshops for the configuration and layout of essential infrastructure elements of the 150 Mm<sup>3</sup> SESRO project to achieve a technical consensus of the preferred configuration within the physical constraints of the site, whilst still delivering the overall outcomes required by the WRMP<sup>3</sup>;
- Project-specific landscape design guidance;
- Biodiversity net gain requirements;
- SESRO draft Design Vision and Design Principles;
- Multi-disciplinary engagement regarding design refinement; and
- Stakeholder engagement, specifically stakeholders with an interest in landscape including representatives from Natural England, the North Wessex Downs National Landscape<sup>4</sup>, Oxfordshire County Council, South Oxfordshire and Vale of White Horse District Council and the Environment Agency, which all are part of the SESRO Landscape and Visual TLG.

The output is the Interim Master Plan. As the design development is ongoing, the Interim Master Plan incorporates alternative options for recreational buildings and facilities, to

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<sup>3</sup> Thames Water (2023). A secure and sustainable water supply. Online. Available at: <https://www.thameswater.co.uk/about-us/regulation/water-resources>. Accessed May 2024.

<sup>4</sup> Note that prior to November 2023, the North Wessex Downs National Landscape was known as the North Wessex Downs Area of Outstanding Natural Beauty (AONB). In this report, the former AONB is now referred to as the North Wessex Downs National Landscape throughout.

enable Thames Water to seek feedback on these through non-statutory public consultation in summer 2024. Additional work is therefore required to further address some of the issues that have been explored in this report, such as zoning of the reservoir, location and provision of recreational buildings and facilities, activities and car parking, because these are dependent on further stakeholder engagement and public consultation. There are also some aspects of the design and mitigation, such as environmental bunding, watercourse diversions, floating islands, architectural approach, shape of the reservoir and public rights of way links that require more detailed technical consideration and design development, and this will be undertaken alongside addressing feedback from non-statutory public consultation and wider stakeholder engagement.

This is a first iteration of the Interim Landscape and Environmental Master Plan Report, which will be updated at key milestones in the Master Plan design development as it progresses towards Development Consent Order (DCO) submission. This iteration of the Interim Master Plan is representative of a step in this design development journey, which has been made to inform the environmental impact assessment (EIA) scoping and the non-statutory public consultation in summer 2024. Further iterations are planned as follows:

- To reflect ongoing design development and address feedback from the non-statutory public consultation, and to inform Statutory Consultation.
- Additional iterations to the Master Plan will be developed as the design progresses through to DCO submission, to reflect technical studies including EIA and Statutory Consultation feedback.

## 1 Introduction

- 1.1.1 In October 2022, Thames Water made a Gate 2<sup>5</sup> submission for the South East Strategic Reservoir Option (SESRO) to the Regulators' Alliance for Progressing Infrastructure Development (RAPID). The main report<sup>6</sup> included an indicative landscape and environment led Master Plan figure, hereafter referred to as the Indicative Master Plan 2022<sup>7</sup>. This was included to illustrate how the engineering requirements for the project could be integrated with the expected requirements for environmental mitigation and potential recreational uses of the site.
- 1.1.2 Since Gate 2, alongside optioneering and design development work, Thames Water has held multiple community information events, engaged with regulators and technical stakeholders through technical liaison groups (TLGs) and undertaken one-to-one consultee engagement. The feedback received as part of this engagement in 2023 has been taken onboard in developing the Interim Master Plan, ahead of further consultation, feedback and design iteration programmed during 2024 and 2025. Feedback received as part of engagement during the first part of 2024, such as initial workshops held in February 2024 with smaller groups of recreational and environmental stakeholders and other interested parties, is summarised in this report. As these workshops were aimed

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<sup>5</sup> The RAPID 'gated process relates to the funding of investigations and development of water resource solutions... There are four gates ...' Gate 2 is the second gate and was focussed on 'investigation and development of solutions' that aligned with water resource management planning.

Ofwat (2023). The RAPID gated process and the proposed water resource solutions. Online. Available at: <https://www.ofwat.gov.uk/regulated-companies/rapid/the-rapid-gated-process/>. Accessed May 2024.

<sup>6</sup> Thames Water (2022). Strategic regional water resource solutions: detailed feasibility and concept design. Standard Gate two submission for South East Strategic Reservoir Option (SESRO). Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/SESRO-Gate-2-Main-Report-FINAL.pdf>. May January 2024.

<sup>7</sup> This figure was also included as Figure 2: Landscape and Environmental Design Strategy Plan in the Technical Supporting Document B2, Terrestrial Environmental Appraisal Report. In addition to informing the appraisal in that report, it was also used to inform the Technical Supporting Document B1, Environmental Appraisal Report (Aquatic) and the Technical Supporting Document B7, Strategic Environmental Assessment (SEA) in the Gate 2 submission.

Thames Water and Affinity Water (2022). South East Strategic Reservoir Option (SESRO). Technical Supporting Document B2. Terrestrial Environmental Appraisal Report. Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/B-2---SESRO-EAR-Terrestrial.pdf>. Accessed May 2024.

Thames Water and Affinity Water (2022). South East Strategic Reservoir Option (SESRO). Technical Supporting Document B1. Environmental Appraisal Report (Aquatic). Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/B1--SESRO-EAR-Aquatic.pdf>. Accessed February 2024.

Thames Water and Affinity Water (2022). South East Strategic Reservoir Option (SESRO). Technical Supporting Document B7. SEA. Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/B-7---SESRO-SEA.pdf>. Accessed May 2024.



at identifying initial issues for further engagement, the feedback will be taken on board in the next iteration of the Master Plan development, once the project team have had the opportunity to engage and explore the feedback further.

- 1.1.3 This report summarises the key features of the Indicative Master Plan 2022 and documents the Master Plan design development process undertaken by the multi-disciplinary project team since Gate 2 up to the end of March 2024. It also provides an Interim Landscape and Environmental Master Plan update (hereafter referred to as the Interim Master Plan), to support the non-statutory public consultation on SESRO in summer 2024. The Master Plan design development has been undertaken on the basis that the location and, broadly, the overall shape and position of the proposed reservoir are as determined through the Water Resource Management Plan<sup>8</sup> (WRMP) and constraints assessment (see Chapter 2 in document J696-DN-A01A-ZZZZ-RP-ZD-100006). This report should be read together with the five option appraisal reports (refer to documents J696-DN-A01A-ZZZZ-RP-ZD-100006 to J696-DN-A01A-ZZZZ-RP-ZD-100010), which explain the optioneering process that has been undertaken for key core infrastructure components in order to determine the preferred configuration of the project. Refer to Appendix A of this report, which sets out a summary of the option appraisal outcomes. This report addresses steps 7 and 8 of the optioneering methodology (see document (J696-DN-A01A-ZZZZ-RP-ZD-100006), comprising confirmation that there are no conflicts between preferred key infrastructure options (7) and master planning to inform non-statutory public consultation (8).
- 1.1.4 A landscape and environment led approach has been taken to the continued Master Plan design development. This approach is based upon good contextual design and collaboration, in order to ensure that the design is sensitive to the surrounding context, well integrated into the landscape and contributes to the delivery of benefits for landscape, nature and people. Updates to the Master Plan have been made in response to:
- Multi-disciplinary options appraisals and internal design workshops for the configuration and layout of essential infrastructure elements of the 150 Mm<sup>3</sup> SESRO project to achieve a technical consensus of the preferred configuration within the physical constraints of the site, whilst still delivering the overall outcomes required by the WRMP<sup>8</sup>;
  - Project-specific landscape design guidance;
  - Biodiversity net gain (BNG) requirements;
  - SESRO draft Design Vision and draft Design Principles;

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<sup>8</sup> Thames Water (2023). A secure and sustainable water supply. Online. Available at: <https://www.thameswater.co.uk/about-us/regulation/water-resources>. Accessed May 2024.

- Multi-disciplinary engagement regarding design refinement; and
  - Stakeholder engagement, specifically stakeholders with an interest in landscape including representatives from Natural England, the North Wessex Downs National Landscape<sup>9</sup>, Oxfordshire County Council, South Oxfordshire and Vale of White Horse District Council and the Environment Agency, which all are part of the SESRO Landscape and Visual TLG.
- 1.1.5 The output is the Interim Master Plan. As the design development is ongoing, the Interim Master Plan incorporates alternative options for recreational buildings and facilities, to enable Thames Water to seek feedback on these through non-statutory public consultation in summer 2024. Additional work is therefore required to further address some of the issues that have been explored in this report, such as zoning of the reservoir, location and provision of recreational buildings and facilities, activities and car parking, because these are dependent on further stakeholder engagement and public consultation. There are also some aspects of the design and mitigation, such as environmental bunding, watercourse diversions, floating islands, architectural approach, shape of the reservoir and public rights of way links that require more detailed technical consideration and design development, and this will be undertaken alongside addressing feedback from non-statutory public consultation and wider stakeholder engagement.
- 1.1.6 This is a first iteration of the Interim Landscape and Environmental Master Plan Report, which will be updated at key milestones in the Master Plan design development as it progresses towards the Development Consent Order (DCO) submission. This iteration of the Interim Master Plan is representative of a step in this design development journey, which has been made to inform the environmental impact assessment (EIA) scoping and the non-statutory public consultation in summer 2024. Further iterations are planned as follows:
- To reflect ongoing design development and address feedback from the non-statutory public consultation, and to inform Statutory Consultation.
  - Additional iterations to the Master Plan will be developed as the design progresses through to DCO application submission to reflect technical studies including EIA and Statutory Consultation feedback.
- 1.1.7 The following information is contained in this report:
- Chapter 2 – sets out the key components and assets of the Master Plan and highlights any updates made since RAPID Gate 2.

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<sup>9</sup> Note that prior to November 2023, the North Wessex Downs National Landscape was known as the North Wessex Downs Area of Outstanding Natural Beauty (AONB). In this report, the former AONB is now referred to as the North Wessex Downs National Landscape throughout.

- Chapter 3 – sets out the design development process for SESRO, as well as the landscape and environment led approach to the Master Plan design development; how the Design Vision and project-specific Design Principles have been defined to guide the development of the Interim Master Plan; and the approach to BNG.
- Chapter 4 – presents the Master Plan Zones that have been defined.
- Chapter 5 – provides a description of the design development of each zone, to explain the rationale behind the key changes that have been made. It also provides a record of any design development and opportunities that have been explored but not currently adopted.
- Chapter 6 – provides a summary of the BNG analysis for the Interim Master Plan.
- Chapter 7 – provides a summary of the Master Plan development and highlights areas that will require further stakeholder consultation and design development during 2024 and beyond, towards DCO application and subsequent detailed design.
- Appendix A – sets out further information regarding the design development process to that summarised in Chapter 3.
- Appendix B – provides feedback on reservoir design and key issues from Natural England on behalf of SESRO Landscape and Visual TLG.
- Appendix C – sets out access and security requirements for the Master Plan.
- Appendix D – illustrates the Interim Landscape and Environmental Master Plan with Below Ground Emergency Discharge Tunnel.
- Appendix E – illustrates the Interim Landscape and Environmental Master Plan Cross Sections of the proposed reservoir embankment.
- Appendix F - illustrates the Indicative Master Plan 2022 (which is included for information and ease of reference and has not been updated since 2022).

## 2 Key Components of the Master Plan

### 2.1 Indicative Master Plan 2022

- 2.1.1 The core purpose of the SESRO project is to store water to ensure a secure and sustainable water supply. The following key components or assets were indicated as required to deliver the project in 2022 in the Gate 2 Main Report<sup>6</sup>:
- *'Provision of a fully bunded raw water storage reservoir in Oxfordshire, 5km south west of Abingdon.*
  - *Pumping station at the toe of the embankment (on the north-east side of the reservoir) including both inflow pumps and outflow energy-recovery turbines.*
  - *Conveyance tunnel to transfer flows via the pumping station to and from the intake / outfall structure on the River Thames near Culham.*
  - *Auxiliary drawdown channel (ADC) linking the reservoir siphons to the River Thames, to allow drawdown of the reservoir in emergency scenarios. This could also form a navigable channel*
  - *Main access road into the site (from A415, Marcham Road) and diversion of the existing East Hanney to Steventon Road.*
  - *Temporary rail siding to facilitate delivery of certain construction materials by freight train.*
  - *Public access, parking and recreation facilities, public education facilities, landscaping and creation of aquatic / grassland habitats.*
  - *Local stream channel diversion to both the east and the west of the reservoir and construction of compensatory floodplain.'*
- 2.1.2 The Indicative Master Plan 2022 for SESRO, as illustrated in Appendix F, was developed to integrate these components and assets. This design development was undertaken through close collaboration between a range of engineering, environmental, planning and land specialists within a multi-disciplinary team. The master planning was informed by the initial understanding of the baseline environment of the indicative location for SESRO and the surrounding landscape, as reported within Technical Supporting Documents B1 and B2, Environmental Appraisal Report (Aquatic)<sup>10</sup> and Terrestrial Environmental

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<sup>10</sup> Thames Water and Affinity Water (2022). South East Strategic Reservoir Option (SESRO). Technical Supporting Document B1. Environmental Appraisal Report (Aquatic). Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/B1--SESRO-EAR-Aquatic.pdf>. Accessed May 2024.

Appraisal Report<sup>11</sup> of the Gate 2 submission to RAPID.

- 2.1.3 The Indicative Master Plan 2022 was developed to respond to the core purpose of the project and the Draft All Company Working Group (ACWG) Design Principles for Strategic Resource Options Projects<sup>12</sup>. These set out 12 design principles under the headings of climate, people, place and value. Section 2 of the Gate 2 Supporting Document A-1: Concept Design Report<sup>13</sup> sets out how the Gate 2 concept design responded to these principles.
- 2.1.4 At Gate 2, high-level landscape and environmental design and mitigation principles were also identified to guide the development of the Master Plan. These are set out in the Technical Supporting Documents B1 and B2, Environmental Appraisal Report (Aquatic)<sup>10</sup> and Terrestrial Environmental Appraisal Report<sup>11</sup>. They have been used to inform the development of the new project-specific Design Principles as discussed in Section 3.40.

## 2.2 Updates to the Key Components of the Interim Master Plan since Gate 2

- 2.2.1 Since development of the Indicative Master Plan 2022 the concept design of the project has been reviewed through a number of multi-criteria option appraisal studies, in line with the design process set out in Chapter 3 and discussed further in Appendix A. These have identified preferred options for essential infrastructure associated with the reservoir. As part of the master planning process, it has been confirmed that there are no conflicts between the preferred infrastructure options. As such, the preferred options have been ratified in line with step 7 of the optioneering methodology (see document (J696-DN-A01A-ZZZZ-RP-ZD-100006) and incorporated into the Interim Master Plan for non-statutory public consultation in summer 2024.
- 2.2.2 The Master Plan has been sub-divided into seven zones, as presented in Chapter 4. These were initially defined for the purposes of presenting the key features of the Master Plan as a simple diagram as part of community information events held during the autumn of 2023. However, the Master Plan Zones have also been used as the basis for facilitating discussions regarding the Interim Master Plan development, both as part of internal and external

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<sup>11</sup> Thames Water and Affinity Water (2022). South East Strategic Reservoir Option (SESRO). Technical Supporting Document B2. Terrestrial Environmental Appraisal Report. Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/B-2---SESRO-EAR-Terrestrial.pdf>. Accessed May 2024.

<sup>12</sup> All Company Working Group (2021). All Company Working Group (ACWG) Design Principles, Process and Gate 2 Interim Guidance. Online. Available at: <https://www.wrse.org.uk/media/fspcib0h/acwg-design-principles-process-and-gate-2-indicators.pdf>. Accessed May 2024.

<sup>13</sup> Thames Water and Affinity Water (2022). South East Strategic Reservoir Option (SESRO). Supporting Document A-1: Concept Design Report. Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/A-1---SESRO-Concept-Design-Report.pdf>. Accessed May 2024.

stakeholder workshops, as explained further in Appendix A.

- 2.2.3 At the time of writing this report, the key components or assets required to deliver the project are largely considered to remain the same, as set out in the Gate 2 Main Report<sup>6</sup>. The key difference relates to the infrastructure for drawdown of the reservoir in an emergency scenario, as a recent appraisal has considered options that either retain the above-ground ADC or remove it from the project by discharging emergency drawdown flow through an enlarged conveyance tunnel. While the Gate 2 Main Report<sup>6</sup> indicated that an ADC was required to deliver the project, the recent option appraisal study has concluded that the enlarged conveyance tunnel option is preferred. The reason for this is that it reduces engineering complexity, reduces land take and generally reduces environmental impacts (refer to document J696-DN-A01A-ZZZZ-RP-ZD-100010 for further information). As such, the Interim Master Plan is based upon an emergency discharge arrangement below ground through the conveyance tunnel.
- 2.2.4 In addition, some other key components have been incorporated into the Interim Master Plan to respond to the Revised Draft Regional Plan Water Resources South East<sup>14</sup> (WRSE) which was published in August 2023. Firstly, the Revised Draft Regional Plan WRSE indicates that water treatment works (WTW) may be required within the SESRO site. While the Indicative Master Plan 2022 incorporated reserved space for WTWs to be installed in the future by a third party, this was incorporated on the assumption that such proposals would not be required at the same time as the reservoir. The Revised Draft Regional Plan WRSE now indicates that Southern Water will require treated water from SESRO when it is commissioned as a preferred pathway project.
- 2.2.5 The proposed site for this Thames to Southern Transfer (T2ST) Strategic Resource Option (SRO) WTW has been subject to an option appraisal to determine a preferred location within the indicative location for SESRO to reserve space for the T2ST WTW development. At the current stage of work, two indicative preferred locations for the WTW have been selected for further consideration and these are indicated on the Interim Master Plan.
- 2.2.6 The Revised Draft Regional Plan also indicates the need for a raw water transfer pumping station and transfer pipeline to the Swindon and Oxfordshire (SWOX) water resource zone and a potential longer-term need for a treated water transfer. Further work will be undertaken before the Gate 3 submission to confirm a preferred configuration for the raw water pumping assets, which are anticipated to have a relatively small above-ground presence. However, within the Revised Draft Regional Plan this is an adaptive pathway project and,

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<sup>14</sup> Water Resources South East (2023). Revised Draft Regional Plan Water Resources South East. Online. Available at: <https://www.wrse.org.uk/media/osiggafk/wrse-revised-draft-regional-plan-august-2023-v1-1.pdf>. Accessed May 2024.



therefore, it may never be built. The potential future SWOX WTW would have broadly similar footprint, constraints and location requirements to that of the T2ST WTW and so the two indicative preferred locations from the T2ST WTW option appraisal provide sufficient information for consideration of reserving space for SWOX, if required.

- 2.2.7
 Consideration has also been given to a potential future Severn Thames Transfer (STT) of water from the North West and the Midlands, via the River Severn and a pipeline to the River Thames, to the South East. Although the Revised Draft Regional Plan *‘does not select STT as an option as part of the regional plan under any of the adaptive planning pathways... WRSE has agreed with adjoining regions that the STT proposal should continue to be progressed as it may be required under future adaptive plans’*<sup>14</sup>. The STT pipeline would pass through the SESRO site and, therefore, there may be a future need for facilities such as an aeration chamber and hydro turbines at the SESRO site for STT. These would have a relatively small above-ground presence. A preliminary location for these facilities has, therefore, been identified on the Interim Master Plan to indicate that a future STT project could be accommodated at SESRO, should this be required.
- 2.2.8
 A number of other refinements to the Master Plan have also been considered since Gate 2 as part of the close collaboration between the engineering, environmental, land and planning specialists within the multi-disciplinary project team to develop the design and address stakeholder feedback. Table 2.1 sets out a concise summary of the key changes. The design development process, including option appraisals, is explained in Chapter 3 and Appendix A, while the rationale for the changes is set out in Chapter 5.

Table 2.1: Summary of changes to the key components and assets in the Interim Master Plan

Key components or assets identified at Gate 2 as required to deliver the project	Summary of changes to the key components and assets in the Interim Master Plan
Provision of a fully bunded raw water storage reservoir with a capacity of 150 Mm <sup>3</sup> in Oxfordshire, 5km south west of Abingdon.	No change since Gate 2 <sup>15</sup> .

<sup>15</sup> Whilst the Thames Water draft Water Resources Management Plan 2024 proposed a 100 Mm<sup>3</sup> reservoir, the Indicative Master Plan 2022 was based on a 150 Mm<sup>3</sup> reservoir. The capacity of the reservoir illustrated on the Interim Master Plan remains 150 Mm<sup>3</sup> and has therefore not changed since Gate 2.

Key components or assets identified at Gate 2 as required to deliver the project	Summary of changes to the key components and assets in the Interim Master Plan
<p>Operational infrastructure: pumping station at the toe of the embankment (on the north-east side of the reservoir) including both inflow pumps and outflow energy-recovery turbines.</p>	<p>Minor refinement to position of pumping station compared with the Indicative Master Plan 2022, to bring it slightly closer to the embankment toe.</p> <p>Other core operational infrastructure has also been incorporated, including priming pumps for the SESRO siphons and a backup generator and fuel tanks.</p> <p>In addition, a preliminary location for an STT aeration chamber and hydro turbines has been identified, to accommodate a future STT connection into the pumping station within SESRO, should this be required.</p>
<p>Conveyance tunnel to transfer flows via the pumping station to and from the intake / outfall structure on the River Thames near Culham.</p>	<p>Update to alignment of conveyance tunnel, to work with the preferred position of the intake / outfall structure identified through option appraisal, which is slightly further upstream of the position shown on the River Thames in the Indicative Master Plan 2022 (refer to the Connectivity to the River Thames Options Appraisal Report (J696-DN-A01A-ZZZZ-RP-ZD-100010)).</p>
<p>Auxiliary drawdown channel (ADC) linking the reservoir siphons to the River Thames, to allow drawdown of the reservoir in emergency scenarios. This could also form a navigable channel.</p>	<p>Updated emergency discharge arrangement through a below ground conveyance tunnel, following option appraisal (refer to document the Connectivity to the River Thames Options Appraisal Report (J696-DN-A01A-ZZZZ-RP-ZD-100010)).</p>
<p>Main access road into the site (from A415, Marcham Road) and diversion of the existing East Hanney to Steventon Road.</p>	<p>Realignment of the main access road to reflect the preferred option, including moving the tie-in with the A415 Marcham Road closer to the A34 (refer to the Access and Diversion Roads Options Appraisal Report (J696-DN-A01A-ZZZZ-RP-ZD-100009)).</p>



Key components or assets identified at Gate 2 as required to deliver the project	Summary of changes to the key components and assets in the Interim Master Plan
Temporary rail siding to facilitate delivery of certain construction materials by freight train.	Further options appraisal has been undertaken since Gate 2 to determine a preferred location for the temporary rail siding (refer to the Rail Siding and Materials Handling Area Options Appraisal Report (J696-DN-A01A-ZZZZ-RP-ZD-100008)). As this asset is not a permanent feature of the project, it is not illustrated on the Master Plan. However, for the next iteration, the Master Plan will need to be updated to incorporate reinstatement of the land associated with the preferred location selected through option appraisal.
Public access, parking and recreation facilities, public education facilities, landscaping and creation of aquatic / grassland habitats.	Refinement of layout of indicative public rights of way (PRoW), permissive paths <sup>16</sup> , recreational facilities, main visitor car parking, landscape and biodiversity habitat proposals, as set out in further detail in Chapter 54.9. Includes two alternative locations each for a visitor centre, water sports centre and an education centre compared with the Indicative Master Plan 2022.
Local stream channel diversion to both the east and the west of the reservoir and construction of compensatory floodplain.	Minor refinements to layout of watercourse diversions compared with the Indicative Master Plan 2022.
Inclusion of reserved space for development of WTWs.	Development of two alternative reserved areas for the future development of the

<sup>16</sup> Permissive paths are pathways that the public are allowed to use because the landowner has made the route available to the public. For further information regarding the difference between PRoW and permissive paths, refer to CPRE The Countryside Charity (2024). Permissive to public: know your pathways. Online. Available at: <https://www.cpre.org.uk/discover/permissive-to-public-know-your-pathways/>. Accessed May 2024.

Key components or assets identified at Gate 2 as required to deliver the project	Summary of changes to the key components and assets in the Interim Master Plan
	T2ST WTWs (and potentially also a SWOX WTW), to better reflect recent options appraisal work (refer to the Water Treatment Works Options Appraisal Report (J696-DN-A01A-ZZZZ-RP-ZD-100007)).

Source: *Thames Water internal.*

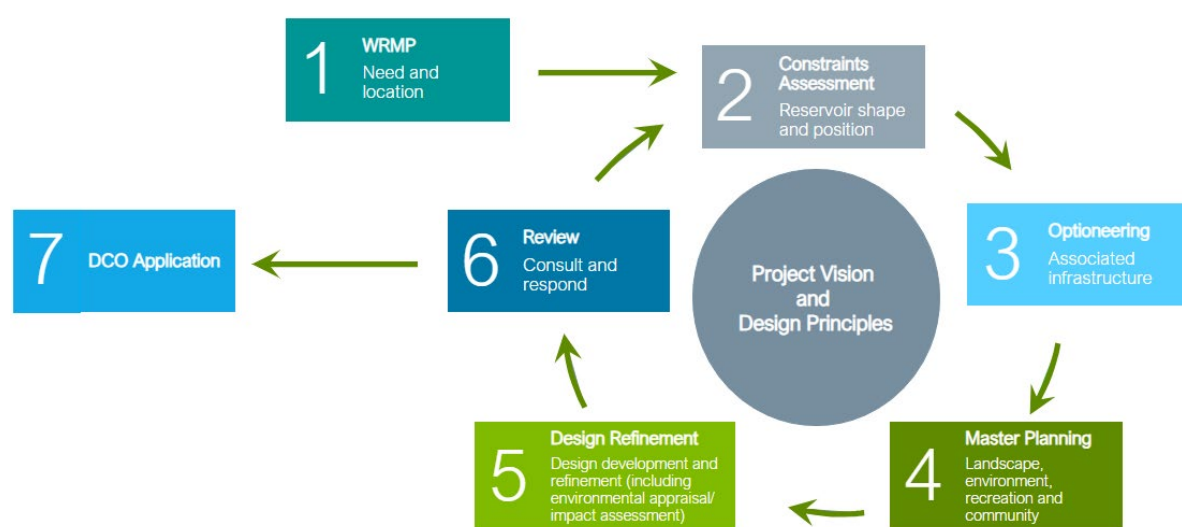
### 3 Master Plan Design Development Process

3.1.1 This chapter sets out the design development process for SESRO, as well as the landscape and environment led approach to the Master Plan design development; how the Design Vision and project-specific Design Principles have been defined for SESRO to guide the development of the Master Plan; and the approach to BNG.

#### 3.2 Design Development Process

3.2.1 SESRO is a large project and requires an iterative design development process that considers the core purpose of the reservoir and its potential to deliver environmental gain and social value. Figure 3.1 summarises the design development process as a series of steps that can be repeated as the design progresses and increasing design data (included survey work and consultations) becomes available. The process is underpinned by a Project Vision and Design Principles that has been developed, as set out in Section 3.40.

Figure 3.1: Multi-disciplinary Design Development Process



Source: SESRO Option Appraisal Context and Methodology Report (J696-DN-A01A-ZZZZ-RP-ZD-100006).

1. **WRMP – Identification of need and location:** SESRO is included on the WRMP24 Constrained List based on an indicative concept design. The WRMP process includes statutory public consultation and develops a best value plan. A number of capacity variants are included on the Constrained List for selection in the WRMP and the plan identifies the need for a 150Mm<sup>3</sup> reservoir at the SESRO location. See Thames Water WRMP24 documentation for further information<sup>8</sup>.
2. **Constraints Assessment – Development of reservoir shape and position:** Identification of the shape, position and footprint of a 150Mm<sup>3</sup> reservoir at

the SESRO location through examination of existing environmental and engineering constraints and required storage capacity.

3. **Optioneering – Associated infrastructure:** Identification of preferences for the core infrastructure necessary for construction and operation of the reservoir through multi-disciplinary, multi-criteria option appraisal, including liaison with technical stakeholders such as Network Rail. This is a critical step in the design development process. As such, Option Appraisal Reports have been produced for each design element considered as part of this process. Refer to Appendix A for further information regarding this.
  4. **Master Planning – Landscape, environment, recreation and community:** Development of a Master Plan for the whole project, a multi-disciplinary exercise focussing on landscape integration, space for nature, recreational and community facilities, including liaison with landscape stakeholders and workshops (refer to Section 3.3).
  5. **Design Refinement – Design development and refinement (including environmental appraisal/impact assessment):** Development of outline design for residual issues, such as utility diversions. May include engineering feasibility to explore different configurations of assets such as pumping station arrangements. Development of sufficient design detail to inform EIA, DCO and procurement. Undertake interim appraisals and, eventually, EIA and iterate design to deliver appropriate mitigation, enhancement and compensation.
  6. **Review – Consult and respond:** Public consultation, stakeholder and community engagement. Ongoing stakeholder and community engagement for SESRO to inform the design development process, EIA and statutory and non-statutory public consultations. At appropriate stages following consultation, the project will undertake another iteration of design development as set out in Figure 3.1 to develop further detail and/or make alterations to work associated with stages 2 to 5 (including a review of option appraisal work, where additional information is identified that could impact option selection).
  7. **DCO Application:** Preparation and submission of the DCO application for SESRO based on iterated outline design.
- 3.2.2 Subsequent to the DCO application and examination (should the Secretary of State grant the DCO), design work would continue to tender design and detailed design for construction. This would include work to discharge DCO Requirements.
- ### 3.3 Landscape and Environment Led Approach to Master Plan Development
- 3.3.1 A landscape and environment led approach has been taken to the continued Master Plan design development. This is in line with feedback provided by the SESRO Landscape and Visual TLG, requesting that the design and delivery of the reservoir should be landscape led, taking into account lessons from reservoir projects built in the UK in the 1950s to 1970s, such as Rutland Water.

For further information regarding the feedback received from the Landscape and Visual TLG, refer to Appendix B.

- 3.3.2 Guidance from Natural England on landscape led design for reservoirs is expected to be published in 2024. As defined in the European Landscape Convention '*Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*'<sup>17</sup>. The Landscape Institute and the Institute of Environmental Management and Assessment (IEMA), therefore, suggest that '*landscape as a resource in its own right... provides an integrated way of conceptualising our surroundings and is increasingly considered to provide a useful spatial framework for thinking about a wide range of environmental, land use and development issues*'<sup>18</sup>. The National Policy Statement for Water Resources Infrastructure states that '*There may be opportunities for the applicant to demonstrate good design in terms of site layout and design measures relative to existing landscape and historical character and function, landscape permeability, landform and vegetation whilst integrating biodiversity and nature conservation interests... A proposed development needs to be designed and located carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints, the aim should be to avoid or minimise harm to the landscape, providing appropriate mitigation or enhancement measures where possible.*'<sup>19</sup>
- 3.3.3 A landscape and environment led approach has, therefore, been taken to the continued Master Plan design development. This approach is based upon good contextual design and collaboration, that recognises the potential impact of the project on the landscape and environment, and reduces the need for mitigation measures. This means that a thorough understanding of the environmental baseline, for example the landscape character of the project site and its surroundings, and the surrounding local communities, is required in order to guide design principles and all elements of design development. The close collaboration between key design disciplines, such as landscape architects, planners, engineers, architects and a wider multidisciplinary team, and consultation with key landscape consultees, is also necessary. This is intended to ensure that design is sensitive to the surrounding context, well integrated into the landscape and contributes to the delivery of benefits for landscape, nature and people. This approach is considered to be consistent with good practice

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<sup>17</sup> Council of Europe (2000). European Landscape Convention. Online. Available at: <https://rm.coe.int/16807b6bc7>. Accessed May 2024.

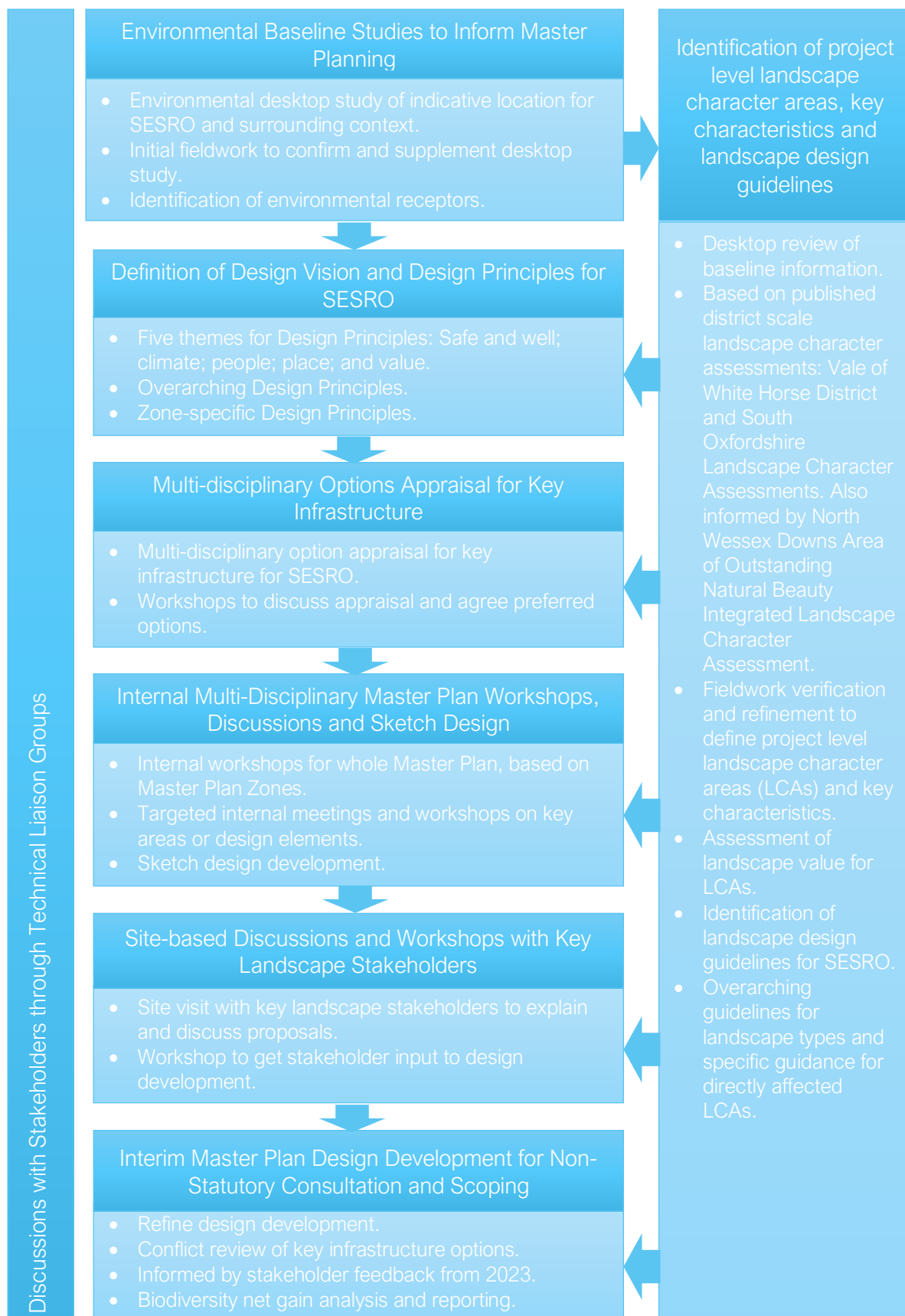
<sup>18</sup> The Landscape Institute and the Institute of Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment (3rd edition).

<sup>19</sup> Department for Environment Food & Rural Affairs (2023). National Policy Statement for Water Resources Infrastructure. Online. Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1150075/E02879931\\_National\\_Policy\\_Statement\\_for\\_Water\\_Resources.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1150075/E02879931_National_Policy_Statement_for_Water_Resources.pdf). Accessed May 2024.

guidance set out in IEMAs Environmental Impact Assessment Guide to: Delivering Quality Development, which advocates pro-active collaboration between the project team and external stakeholders and states that *'Consideration of mitigation should be undertaken from the earliest possible design stage following the completion of baseline data collection and appraisal'* and that *'modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project' has the 'greater ability to avoid impacts'*.

- 3.3.4 Figure 3.2 illustrates the landscape and environment led Interim Master Plan design development process for SESRO up to March 2024, leading up to non-statutory public consultation and EIA scoping.
- 3.3.5 Further information regarding the development of the Design Vision and Design Principles for SESRO is set out below. Additional information regarding the identification of project level landscape character areas; options appraisals; internal multi-disciplinary master plan workshops and discussions; and site-based discussions and workshops with stakeholders is set out in Appendix A.

Figure 3.2: Interim Master Plan Design Development Process up to March 2024



Source: Thames Water internal.



### 3.4 Development of Design Vision and Design Principles

- 3.4.1 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 detail design to be developed. Design principles have been used on major projects such as Thames Tideway Tunnel and the Lower Thames Crossing, where they have formed part of the DCO application. Consequently, they can be secured by a requirement within the DCO, becoming a legal obligation on the designer and construction contractor. This process ensures that good design continues from the early stages of a project through to construction and delivery.
- 3.4.2 In order to guide the development of appropriate design principles a project should also develop a design vision. The vision should be a concise statement that encapsulates the developer's ambitions for the project. The purpose of the design vision is to set the strategic direction of design development, create a framework for the design principles and help external stakeholders and the public understand the aims of the project.
- 3.4.3 Although design principles have historically been used on major projects, in February 2020, the National Infrastructure Commission (NIC) issued guidance<sup>20</sup> on the use of design principles for National Infrastructure projects around the four themes entitled Climate, People, Places, Value. The guide states '*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.
- 3.4.4 The All Company Working Group (ACWG) was set up to ensure that water companies with SROs were using a consistent approach to the development of new water infrastructure where possible. The ACWG commissioned a number of studies to identify where inconsistencies were needed and how approaches could be aligned between different companies and SROs. In 2021, the ACWG issued interim Gate 2 guidance to water companies<sup>21</sup> on how they expect design principles to be applied to SRO projects, such as SESRO. This guidance was revised in 2023 to align with the requirements for RAPID Gate 3. The guide states '*we challenge each SRO to produce an ambitious vision and establish design principles early in their development process – and then to hold*

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<sup>20</sup> National Infrastructure Commission (2020). Climate, People, Places, Value, Design Principles for National Infrastructure. Online. Available at: <https://nic.org.uk/app/uploads/NIC-Design-Principles.pdf>. Accessed May 2024.

<sup>21</sup> All Company Working Group (2021). All Company Working Group (ACWG) Design Principles, Process and Gate 2 Interim Guidance. Online. Available at: <https://www.wrse.org.uk/media/fspcib0h/acwg-design-principles-process-and-gate-2-indicators.pdf>. Accessed May 2024.



*themselves to account for meeting them*<sup>22</sup>. The revised principles reinforce the importance of good design and include principles associated with landscape and environmental value.

3.4.5 The ACWG guidance builds on the NIC guidance and requires 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 project 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'*

3.4.6 Natural England is also in the process of developing landscape-led design principles and guidance for new reservoirs and associated infrastructure that will be published in 2024. Thames Water has been consulted on this emerging guidance as part of stakeholder consultation carried out by Natural England. The SESRO design principles have been developed with regard to this emerging guidance. Once the Natural England guidance is published, it will be used to inform further development of the SESRO design principles.

3.4.7 Since Gate 2, a Design Vision for SESRO has been drafted, stating that:

'We will deliver a reservoir for the south east which will help to protect customers, communities and the environment from drought.

We will provide a safe, sustainable and resilient water supply for future generations whilst delivering new high-quality spaces for nature and recreation, creating a lasting legacy for communities and the environment.'

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<sup>22</sup> All Company Working Group (2023). Water Resources: Design Principles & User Guidance. A framework to support the development of exemplar projects. Online. Available at: <https://www.wrse.org.uk/media/cumkcxyg/acwg-design-principles-methodology-document.pdf>. Accessed May 2024.

- 3.4.8 This Design Vision has been used to guide the development of draft project-specific Design Principles. These comprise:
- An overarching set of SESRO Design Principles; and
  - Zone-specific Design Principles.
- 3.4.9 The project-specific Design Principles have been categorised into the themes set out in the ACWG guidance; safe and well, climate, people, place and value.
- 3.4.10 The high-level landscape and environmental design and mitigation principles identified at Gate 2, as set out in the Technical Supporting Documents B1 and B2, Environmental Appraisal Report (Aquatic)<sup>10</sup> and Terrestrial Environmental Appraisal Report<sup>11</sup>, have been used to inform the development of the new project-specific Design Principles. The development of the project-specific Design Principles relating to people and place have also been informed by the character of the local landscape and landscape design guidance identified for SESRO (refer to Appendix A)1.1Appendix A, stakeholder feedback received from the Landscape TLG during 2023 (refer to Appendices A and B) and an understanding of the wider environmental context based on the work undertaken at Gate 2.
- 3.4.11 The SESRO draft Design Principles are set out in document J696-AA-ZZZZ-ZZZZ-RP-ZD-100001. The draft Design Vision and Design Principles for SESRO have been used to guide the development of the Interim Master Plan.
- 3.4.12 Consultees, including the general public and technical stakeholders, will be asked to provide feedback on the Design Principles as part of the non-statutory public consultation in summer 2024. Eventually they will form part of the SESRO DCO application.

### 3.5 Approach to Biodiversity Net Gain

- 3.5.1 As part of the Gate 2 submission to RAPID, a BNG assessment was undertaken for SESRO, as set out in the Technical Supporting Document B6, Biodiversity Net Gain Report<sup>23</sup>. The purpose of the assessment was to present the calculations of the losses and gains in biodiversity units as a result of SESRO. The assessment included all types of habitats including terrestrial based components such as grasslands, hedgerows and woodlands as well as aquatic elements such as wetlands, ponds, rivers and ditches. The assessment primarily considered the habitats within the indicative location for SESRO based on the 150 Mm<sup>3</sup> reservoir option. The terrestrial habitat types present and their

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<sup>23</sup> Thames Water and Affinity Water (2022). South East Strategic Reservoir Option (SESRO). Technical Supporting Document B6. Biodiversity Net Gain Report. Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/B-6---SESRO-BNG.pdf>. Accessed May 2024.

condition status were based on aerial imagery and conservative assumptions have been made with respect to some of the habitats present as land access to the full extent of the indicative location for SESRO was not available at the time of assessment. A geomorphic walkover survey was limited to public rights of way. For the Gate 2 submission, it was agreed with regulators that the Biodiversity Metric 3.0 (published by the Department for Environment Food & Rural Affairs (Defra)) was the most appropriate tool for the assessment. This has now been replaced by the Statutory Biodiversity Metric (dated November 2023).

- 3.5.2 The Gate 2 preliminary BNG calculations identified a deficit of proposed hedgerow units in the Indicative Master Plan 2022. Additionally, the Trading rules for Lowland Mixed Deciduous Woodland (LMDW) could not be met. This is because LMDW is a habitat of high distinctiveness and a worst case assumption was made that all woodland on site was LMDW of good condition. Habitats of high distinctiveness to be permanently lost, require replacement on a 'like for like' or 'like for better' basis which is difficult to achieve on site. Consequently, the results of the Gate 2 BNG assessment did not meet all of the requirements for the 10% BNG target. It should be noted that habitats overall achieved a significant gain in biodiversity through the creation of wetland areas, species-rich grassland, scrub and other woodland and wet woodland. Consequently, the Interim Master Plan design development has, amongst other matters, focussed on addressing the hedgerows and woodland deficits.
- 3.5.3 From a watercourse perspective (rivers/streams and ditches), the Gate 2 BNG calculations suggested that the 10% target could be met within the indicative location for SESRO. As discussed in Chapter 6, this assessment has been updated as the river/stream and ditch alignments have been refined, as part of the Interim Master Plan development, and the new Statutory Biodiversity Metric guidance has resulted in changes to the watercourses metric that must be considered in the BNG assessment.
- 3.5.4 Under current government policy, mandatory BNG for Nationally Significant Infrastructure Projects (NSIPs) is due to come into force in November 2025, so will be in place at the time of the SESRO DCO application. A Defra Biodiversity Net Gain Statement with details of the requirements, alongside further NSIP guidance, is due to be published in September 2024. It is expected that this will specify a requirement for the provision of at least 10% BNG, which is in line with the requirement set in the Environment Act 2021, which came into force through secondary legislation in February 2024. However, no further details as to the requirements and guidance for NSIPs are available at the time of writing.
- 3.5.5 As the Master Plan continues to develop towards a DCO submission, further BNG calculations will be required. The Statutory Biodiversity Metric is now available and has been used to update loss/ gain calculations for the Interim Master Plan, as set out in Chapter 6. The purpose of this work has been to give an early indication of whether 10% BNG can be delivered within the indicative location for SESRO ('on site'), whilst delivering appropriate habitats within the

wider landscape and in balance with broader considerations such as operational requirements and recreational opportunities.

- 3.5.6 Within the current Joint Local Plan Options Consultation<sup>24</sup> by South Oxfordshire and Vale of White Horse District Councils, a local BNG policy is proposed of ‘*at least 11-25% biodiversity net gain (whatever is the maximum assessed as deliverable through the Joint Local Plan Viability Assessment)*’. If this is adopted, and while it would not override the Water Resources National Policy Statement, nor the forthcoming Biodiversity Gain Statement for NSIPs, proposed local authority policy expectations are taken into account and given weight in decision-making on a DCO application.
- 3.5.7 Further iterations of the BNG calculations will be undertaken as required as further information becomes available and the project progresses through subsequent stages of Master Plan development towards DCO application.

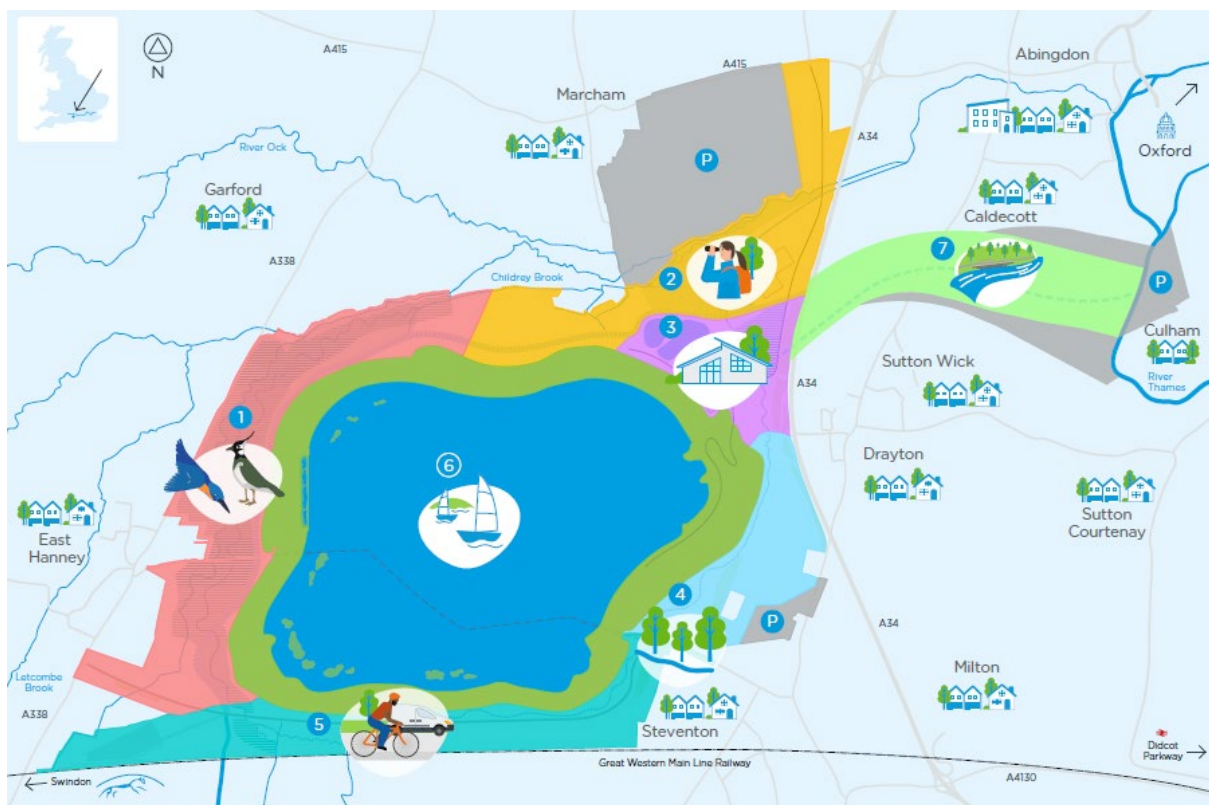
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<sup>24</sup> South Oxfordshire District Council and Vale of White Horse District Council (2024). Joint Local Plan preferred Options Consultation (Regulation 18 Part 2). Online. Available at: <https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2024/01/Joint-Local-Plan-Preferred-Options-Document.pdf>. Accessed May 2024.

## 4 Master Plan Zoning

4.1.1 As stated in Chapter 2 and illustrated on Figure 4.1, the Master Plan has been sub-divided into seven broad zones. The sub-division of the Master Plan was first published in 2023, based on the Indicative Master Plan 2022 design features and informed by the local landscape character. Since then, the Master Plan Zones have been further refined to align with the design development of the Interim Master Plan. An explanation of the key features for each of the zones is set out below, along with a brief explanation of the key updates made within this latest iteration of the Interim Master Plan. An explanation of the rationale for the changes is set out in Chapter 5.

Figure 4.1: Master Plan Zones



Source: Thames Water internal.

### 4.2 Zone 1

4.2.1 Zone 1 is focussed on a proposed corridor for a watercourse diversion, hereafter referred to as the western watercourse diversion, and associated replacement floodplain storage. The main watercourses within this area include the realigned Cow Common Brook, Portobello Ditch and the East Hanney Ditch which would be diverted around the western side of the proposed reservoir and the habitats would be improved compared to the current baseline. The source of the East Hanney Ditch is within this zone, south of the existing Steventon Road. The sources of both the Cow Common Brook and the Portobello Ditch are south of the Great Western Main Line railway with the headwaters of both

catchments arising on the northern side of the Ridgeway. The western watercourse diversion and realigned East Hanney Ditch would both flow into the Childrey Brook to the north of the indicative location for SESRO, which joins the River Ock at Marcham Mill. This zone would incorporate an extensive new watercourse, wetland and wet woodland habitats for a range of wildlife. Visitors would be able to enjoy the wetland and wildlife from the PRow or permissive paths, which are indicated as mainly located around the edges of the wetland. Disturbance to wildlife by walkers and dogs would be managed sensitively through planting and strategic placement of wet features like ditches. There may also be some bird hides.

- 4.2.2 The Indicative Master Plan 2022 also included an indicative location for an education centre and associated wildlife ponds and scrapes within this zone, near the north-western corner of the reservoir embankment. Whilst the Master Plan will continue to make provision for educational facilities, in this latest version of the Interim Master Plan, alternative locations for the education centre are indicated within Zones 3 and 6, as options for consultation, and as set out in Chapter 5. This is, amongst other considerations, to avoid excessive disturbance to wildlife within Zone 1.
- 4.2.3 Proposed PRow or permissive paths would connect from East Hanney, providing local access to this area although not across the flood compensation area for safety and wildlife protection purposes. A corridor to reserve space for the potential future route of the Wiltshire and Berkshire Canal is also identified within this zone. This ensures the protection of the canal corridor alignment to potentially help facilitate rebuilding of it in the future by others.

## 4.3 Zone 2

- 4.3.1 Zone 2 is focussed on the proposed main visitor and operational access to SESRO from the A415 Marcham Road, located close to the A34 junction west of Abingdon. The optimal alignment of this access has been reconsidered further and updated in this Interim Master Plan, as explained further in Sections 2.2 and 5.3, and Appendix A.
- 4.3.2 Another key feature of this zone is a proposed corridor for a second watercourse diversion, hereafter referred to as the eastern watercourse diversion, with associated new wetland habitats with boardwalks and bird hides. The eastern watercourse diversion would be the future route for various watercourses such as ditches that comprise the Mere Dyke system and would have improved habitats compared to the current baseline. Part of a corridor to reserve space for the potential future route of the Wiltshire and Berkshire Canal is also identified within this zone. This ensures the protection of the canal corridor alignment to potentially help facilitate rebuilding of it in the future by others.
- 4.3.3 An area of additional replacement floodplain storage is included in this zone to replace floodplain storage lost as a result of the new main access road.



- 4.3.4 The Indicative Master Plan 2022 incorporated space for a WTW to be installed in the future by a third party within Zone 3, on the assumption that such proposals would not be required to be constructed at the same time as the reservoir. As explained in Section 2.2, the Revised Draft Regional Plan WRSE<sup>14</sup> now indicates that Southern Water will require treated water from SESRO when it is commissioned. The preferred location for such a WTW has, therefore, been considered through option appraisal. As a result, two alternative locations for WTW have been selected for further consideration and these are indicated on the Interim Master Plan, one within Zone 2 and the other within Zone 3.

#### 4.4 Zone 3

- 4.4.1 Zone 3 is indicated as the main hub and gateway for recreation and leisure facilities, with an indicative location for a visitor centre incorporated in this zone in the Indicative Master Plan 2022 near two lakes (settlement ponds created during construction and retained). The design of these lakes has been refined and updated in this iteration of the Interim Master Plan to form recreational lakes. The arrangement of recreational facilities has also been reviewed and an alternative location for a visitor centre is now proposed near the north-eastern corner of the reservoir embankment, whilst an education centre, a café and other recreational facilities are now proposed near the recreational lakes in this latest version of the Interim Master Plan.
- 4.4.2 The proposed eastern watercourse diversion would also pass through this zone. Access for walkers/wheelers, cyclists and horse-riders to and from Drayton, would be maintained via the bridleway that crosses the A34. Environmental bunding is proposed along the A34, to provide noise and visual screening for visitors to the indicative location for SESRO from traffic associated with the A34. The extent of this bunding has been refined in this iteration of the Interim Master Plan.
- 4.4.3 Operational facilities are also proposed in this zone, including a pumping station for normal operation of the reservoir (filling the reservoir and transferring reservoir water to the WTW) and infrastructure for emergency release of water to the River Thames. At Gate 2, the drawdown of the reservoir in an emergency scenario was proposed via an above ground ADC, as discussed further in Section 4.84.8 of this report. This is no longer included in the Interim Master Plan to align with the outcome of the option appraisal for this component, which concluded that the preferred emergency discharge arrangement is through a below ground conveyance tunnel only, as explained in Chapter 2.
- 4.4.4 As explained in Section 4.3, one of two alternative locations for WTWs are indicated on the Interim Master Plan within Zone 3.

#### 4.5 Zone 4

- 4.5.1 Zone 4 is focussed on the proposed corridor for the eastern watercourse diversion, incorporating areas with wildlife ponds, scrapes and wet woodland.

This is envisaged as a space for natural leisure and play.

- 4.5.2 Environmental bunding is proposed to the north-west of Steventon to help create some visual separation between the recreational areas and the adjacent electrical substation, associated pylons and overhead lines near Steventon. New PRoW or permissive paths for walkers and/or wheelers, riders and cyclists are indicated to provide access to and from Steventon. Environmental bunding is also proposed along the A34 to provide noise and visual screening for visitors to the indicative location for SESRO from traffic associated with the A34.

## 4.6 Zone 5

- 4.6.1 The eastern watercourse diversions would originate from Zone 5, flowing east and ultimately entering the River Ock to the north, downstream of Marcham Mill.
- 4.6.2 A proposed diversion of the road between Steventon and East Hanney would also be included within Zone 5, incorporating a segregated footway and cycleway, which would be located on the north and south side of the carriageway respectively. This would be a significant improvement compared with the existing road between Steventon and East Hanney, which does not incorporate foot or cycleways.
- 4.6.3 During construction, rail sidings along the Great Western Main Line are proposed in this zone, to facilitate sustainable movement of materials to the site. The design has been revised to reflect that woodland within The Cuttings and Hutchins Copse Local Wildlife Site (LWS) is no longer anticipated to require removal, due to a change to the preferred rail siding location, as explained further in Appendix A. Furthermore, additional woodland has been proposed between the Great Western Main Line railway and the Steventon to East Hanney road diversion to increase the woodland habitat in the vicinity of The Cuttings and Hutchins Copse LWS. As the rail sidings would be removed at the end of construction, they are not illustrated on this Interim Master Plan. However, for the next iteration, the Master Plan will need to be updated to incorporate reinstatement of the land associated with the preferred location selected through option appraisal.

## 4.7 Zone 6

- 4.7.1 Zone 6 is focussed on the proposed reservoir waterbody and associated embankments. The reservoir is envisaged to provide the opportunity for a range of non-motorised water-based recreational activities, such as angling and/or sailing supported by a small number of electric motorised craft for access and safety. Wetland lagoons and floating islands are proposed to improve the biodiversity value of the reservoir and to visually soften the appearance of the edges.
- 4.7.2 Indicative PRoW or permissive paths are proposed for walkers and/or wheelers,



riders and cyclists around the crest (integrated with vehicular access for operational purposes) and base of the embankment, with links in between and connections to a wider network of walking and cycling routes across the site. Indicative vantage points with seating areas have also been identified, to allow views towards the North Wessex Downs National Landscape to the south and limestone ridge to the north.

- 4.7.3 As part of the Indicative Master Plan 2022, embankment earthworks with slackened slopes and varied slope gradients were proposed to help integrate the embankments into the surrounding landscape. In addition, localised high points with landscape fill were proposed along the embankment crest to allow woodland copses to be planted and make the embankment earthworks look more natural. The remainder of the embankments were intended to comprise grasslands, mainly for sheep grazing, with a localised area for species-rich neutral grasslands to improve biodiversity value. The earthworks design and arrangement of grassland and planting on the embankment has been reviewed and refined as part of this Interim Master Plan, as set out in further detail in Section 5.65.6.

## 4.8 Zone 7

- 4.8.1 Zone 7 incorporates an underground tunnel to move water between the River Thames and SESRO, with an intake/outfall structure and control building located on the bank of the River Thames. Water would be pumped from the River Thames to SESRO during higher river flows and released back into the River Thames when downstream abstraction locations require, typically during lower river flows.
- 4.8.2 At Gate 2, the facilities for drawdown of the reservoir in an emergency scenario included an above ground ADC which would be partially aligned with the existing Oday ditch system. The ADC could form part of the Wiltshire and Berkshire Canal Trust's vision to rebuild the Wiltshire and Berkshire Canal and it was envisaged that new recreational access to SESRO could be provided in conjunction with the ADC, including towpaths for walkers and/or wheelers and cyclists, and access for recreational boats from the River Thames. However, the ADC is no longer included in the Interim Master Plan to align with the outcome of the option appraisal for this component, which concluded that the preferred emergency discharge arrangement is through the below ground conveyance tunnel only, as explained in Chapter 2. This is discussed further in Section 5.7 of this report.

## 4.9 Zones P

- 4.9.1 Zones P are potential areas for Master Plan amendment following consultation and ongoing design work on options for associated infrastructure. As the Indicative Master Plan 2022 and the Interim Master Plan do not incorporate these zones, they are not discussed further in this report.

## 5 Summary of Interim Master Plan Design Development

- 5.1.1 This chapter sets out a summary of the Master Plan design development following Gate 2, to explain the rationale behind the Interim Master Plan. The Interim Master Plan has been developed based on an emergency discharge arrangement below ground through a conveyance tunnel only. The Interim Master Plan is presented in Appendix D.

### 5.2 Zone 1

#### Western watercourse and ditch diversions

- 5.2.1 Minor refinements to the wetland ditches at the north-western corner have been made since the Indicative Master Plan 2022, reducing some of the wetland ditch length in this zone to account for wetland habitats that have recently been constructed by the Freshwater Habitats Trust in this area. If further ditch length is required as part of future BNG updates, additional wetland ditch length can be incorporated elsewhere within the indicative location for SESRO.

#### Corridor for future canal diversion

- 5.2.2 A corridor has been left to reserve space for the potential future route of the Wiltshire and Berkshire Canal between the reservoir embankment and the western watercourse diversion. This ensures the protection of the canal corridor alignment to potentially help facilitate rebuilding of it in the future by others.
- 5.2.3 This concept has not changed since the Indicative Master Plan 2022.

#### Car parking

- 5.2.4 The proposed car park arrangement within Zone 1, as illustrated on the Interim Master Plan, has not been changed from that illustrated on the Indicative Master Plan 2022. A minor car park (including disabled bays) is proposed at the base of the reservoir embankment just outside of East Hanney. This is intended to be for use by residents from the nearby villages to enable parking and pedestrian access to the reservoir site. The method of controlling access to the car park by locals only is yet to be determined.
- 5.2.5 Access to the car park would be provided from East Hanney to the west, using part of the existing Steventon Road, which would be left after construction of the proposed Steventon to East Hanney road diversion to the south. The rationale for retaining this section of road at Gate 2, was that it would enable an alternative access point for operational vehicles to the access track around the base of the reservoir embankment (refer to Appendix C) and, in conjunction with this, it was considered appropriate to also include provision for a minor car park for local access. As the changes to the layout of key infrastructure as a result of the recent options appraisals (refer to Appendix A) has not affected

this arrangement, it has been retained as part of the Interim Master Plan.

### Landscape and biodiversity habitat design

- 5.2.6 The landscape and biodiversity habitat design in Zone 1 is focussed on the western watercourse diversion, associated watercourse realignment and ditch diversions. It therefore comprises a large area of wetland habitat mosaic with reeds, species rich wet grassland and floodplain marsh, as well as localised areas of wet woodland and a series of ponds and scrapes. This area has been developed, and updated, following feedback from the Environment Agency at Gate 2. Based on the current baseline information and engagement, the approach to the Gate 2 design for this area has been confirmed to be generally appropriate and the design is, therefore, largely the same as at Gate 2. However, the design has been reviewed to identify opportunities for:
- Addition of further wet woodland, due to a deficit of woodland in the Indicative Master Plan 2022 to mitigate for the loss of existing woodland.
  - Addition of hedgerows beyond the watercourse diversions, in response to the overarching and zone-specific Design Principles for SESRO, to better integrate the proposals with the surrounding landscape pattern, and due to the deficit of hedgerows in the Indicative Master Plan 2022 to mitigate for the loss of existing hedgerows.
- 5.2.7 As a result, refinements have been made to the proposals for wet woodland, new species-rich native hedgerows with trees and enhancement of existing hedgerows and tree belts. The additional hedgerows within this zone have been incorporated in the area surrounding the watercourse diversion and wetland habitat mosaic, but not encroaching on these features. The continued habitat design development in this area, including the arrangement of wet woodland and hedgerows, will take account of: feedback received from stakeholders during the workshops in February 2024; information received from the Freshwater Habitats Trust in February 2024 regarding ground nesting birds (curlew) in the far north-eastern part of Zone 1; and respond to further baseline survey information as this becomes available, alongside feedback from non-statutory consultation. This is because more time is required for the project team to fully consider the design development in this area.
- 5.2.8 Additional woodland has also been incorporated at the far southern extent of Zone 1 in the vicinity of its transition to Zone 5. Refer to Section 5.5 for further detail regarding the rationale for this.

### Recreational provisions

- 5.2.9 The Indicative Master Plan 2022 included an indicative location for an education centre near the north-western corner of the reservoir embankment. As part of a wider review of the locations of recreational and operational facilities for SESRO to develop the Interim Master Plan, it was concluded that the education centre could be better placed elsewhere on site (refer to Section

5.3 for further detail). An alternative location within Zone 1 was considered as part of the review, near the eastern end of the remaining section of Steventon Road, near the western embankment toe. However, this option was rejected as it is envisaged that Zone 1 would be an area for quieter recreational activities such as bird watching and an education centre with potentially noisy activities was not considered in keeping with this. This decision also recognised that there could be potential impacts from routing traffic (such as coaches for visiting school children) through East Hanney to a small car park for such an education centre location and that it instead would be preferable to route education centre traffic into SESRO via the main access road and onwards provision. As a result, the education centre is no longer included within Zone 1.

- 5.2.10 The main recreational provisions within Zone 1 are the proposed network of indicative PRoW diversions and other permissive paths. Since Gate 2, some additional routes have been added towards the north-eastern part of Zone 1, to provide a nature trail linking the proposed wildlife ponds and scrapes. These additional routes are located to the east of the proposed western watercourse diversion and wetland habitat mosaic, to avoid disturbance to wildlife within the wetland. However, the design of these PRoW or permissive paths will be considered and refined further, in light of information received from the Freshwater Habitats Trust in February 2024 regarding ground nesting birds (curlew) in this area, alongside feedback from non-statutory consultation.
- 5.2.11 As mentioned in Section 4.20, disturbance to wildlife by walkers and dogs within the wetland would be managed sensitively through planting and strategic placement of wet features like ditches. There may also be opportunity for provision of some bird hides.

## 5.3 Zone 2 and 3

### Main access road/SESRO 'gateway'

- 5.3.1 The main access road to the reservoir is one of the elements of the SESRO project that has been subject to option appraisal, as further detailed in Appendix A. However, the resulting preferred option alignment is similar to the alignment shown on the Indicative Master Plan 2022. A notable change is that the junction with the A415 is further to the east. The alignment of the main access road has also been adjusted slightly further west to avoid direct impact of the associated construction works on adjacent allotments.
- 5.3.2 The main access road traverses the reservoir embankment to the crest using the same alignment as the Indicative Master Plan 2022. However, as part of the Interim Master Plan development process, the previously proposed service roads in and around the pumping station location have been updated. In the Interim Master Plan the main access road splits to provide an access spur to the area north of the reservoir for the WTW, as well as the area assigned for recreational buildings adjacent to the recreational lakes.
- 5.3.3 As explained in Appendix A, during a design development workshop to focus on

the arrangement of operational and recreational facilities it was concluded that operational and recreational assets should have a clear separation between each other where possible, not only for safety and security reasons, but also to enhance the visitor experience of SESRO and provide a clear purpose for their visit through interconnected spaces. However, it was considered that there would be sufficient space within Zones 2 and 3 to have more than one area of focus for recreation, i.e. around the recreational lakes and close to the route up to the reservoir, as visitors would be coming to SESRO for a range of different experiences.

- 5.3.4 On the Interim Master Plan, the main access road heads south from the new junction on the A415 and acts as a gateway for visitors, including drivers, walkers/wheelers and cyclists. Visitors would be able to see the landscaped embankment of the reservoir come into view as they arrive and as the road alignment crosses over the eastern watercourse diversion, before splitting close to the toe of the embankment at the north-east corner. At this point, visitors would be able to continue south and, if arriving by car, they would be directed to the main car park at the foot of the embankment. Visitors requiring access to the water sports centre or accessible parking near the waterside café, would pass through a security barrier and access the crest via the road which traverses the embankment. Alternatively, visitors could head west at the split in the road. Initially, this route would take visitors past the pumping station, where it is anticipated that localised fencing and security would be installed around these operational assets, as described in Appendix C. The proposed road then continues to a recreational area which would include a café, angling/swimming facilities and a potential location for an education centre. Beyond this point it would be possible for visitors to continue by foot as the access road transitions into a track to form part of an indicative PRoW or permissive path around the toe of the embankment.
- 5.3.5 It is noted that visitors would also be able to travel to the area around the visitor centre by walking/wheeling, cycling or horse riding from Drayton using the existing bridleway over the A34 that would be retained. The network of indicative PRoW diversions and permissive paths have been designed to integrate with this.

#### Eastern watercourse and ditch diversions

- 5.3.6 As a result of a design development workshop to focus on the arrangement of operational and recreational facilities (refer to Appendix A), the eastern watercourse diversion and various ditches in Zones 2 and 3 were realigned. The location of various infrastructure elements changed which allowed for a less constrained alignment to be formed. In developing the Interim Master Plan, a 30m wide corridor was set aside for the eastern watercourse diversion to allow for a suitable riparian buffer and space to develop an area that the new channel could flood into to allow it to function more naturally. Aligned with this corridor, indicative PRoW or other permissive paths have been incorporated in the design to align with the watercourse corridor to form a new stream side trail.

These are located away from the bank edge and outside of the watercourse corridor where it would pass through the replacement floodplain storage, so that access for visitors would be maintained even when the eastern watercourse diversion may be flooded.

#### Emergency discharge arrangement

- 5.3.7 As explained in Chapter 2, the emergency drawdown arrangements for the project have been subject to option appraisal. As set out in further detail in Appendix A, the outcome of the options appraisal for the emergency discharge has concluded that an emergency discharge arrangement below ground through the proposed conveyance tunnel is preferred. The Interim Master Plan has been updated to reflect this. This is discussed further in Section 5.7 of this report.

#### Siting of SESRO and potential future STT operational infrastructure

- 5.3.8 At Gate 2, the only operational infrastructure shown on the Master Plan was the pumping station. As discussed in Appendix A the pumping station remains in a similar location on the Interim Master Plan, albeit moved slightly closer to the reservoir embankment toe.
- 5.3.9 As part of a design development workshop to focus on the arrangement of operational and recreational facilities, as detailed in Appendix A, additional operational infrastructure was added to Zone 3. Spatial constraints, operational requirements and other considerations, as detailed below, were taken into account in the preliminary siting of the infrastructure. It is noted that the space that would be taken up by the provision of the STT subsidiary infrastructure, which acts to 'future proof' against uncertainty in the current WRMP<sup>8</sup>, is small compared the overall scale of SESRO and would be accommodated with no additional land take.
- **Priming pumps for the SESRO siphons** – Required to be located close to the siphons (if required) and to an access road.
  - **Backup generator and fuel tanks** – Not currently in the design scope, pending further operational strategy work later in 2024, but it is assumed this would be required for the pumping station in case electrical supply is interrupted. It is noted that a backup generator could also serve the WTW, so the location might be amended in the future to be closer to the WTW.
  - **STT aeration chamber and hydro turbines** – A preliminary location for potential future infrastructure if required to serve the STT project, if it goes ahead. Required to be on the STT pipeline alignment and, for the purpose of the Interim Master Plan design development, it is assumed that the STT pipeline would connect into the SESRO pumping station structure. Ideally located close to an access road.



### Allocation of space for water treatment works

- 5.3.10 Two preferred locations for WTWs have been identified.
- 5.3.11 The first is an area north-east of the proposed reservoir embankment and south-east of an area of replacement floodplain storage which would be reached via the SESRO main access road. The option would be in close proximity to the pumping station, which means that only a limited length of raw water pipeline would be required. The treated water transfer pipeline would run south along the toe of the embankment to the southern indicative extent of SESRO, at the Great Western Main Line railway.
- 5.3.12 The second preferred location has been identified in an area further from the proposed reservoir, to the northeast, in an area of slightly elevated topography compared with the surrounding landscape. The WTW would be reached via the SESRO main access road. This would require a junction for access to the WTW further north, when compared to the first option. The raw water and treated water transfer pipework required for the option would be routed similarly to the first option, although it would be slightly longer.

### Corridor for future canal

- 5.3.13 Due to the change to the preferred emergency discharge arrangement, the corridor for the potential future Wiltshire and Berkshire Canal has been altered in this zone, to extend from the west, up to the A34. This corridor has been incorporated into the Interim Master Plan to reserve space for the potential future route of the Wiltshire and Berkshire Canal. This ensures the protection of the canal corridor alignment to potentially help facilitate rebuilding of it in the future by others.

### Siting of recreational buildings and facilities

- 5.3.14 It is currently assumed that a number of recreational buildings would be provided as part of SESRO, including a main visitor centre; an education centre, a building with facilities for anglers and/or swimmers and a café near the recreational lakes; along with a waterside café and water sports centre on the reservoir embankment. Potential locations for the buildings were discussed at a design development workshop to focus on the arrangement of operational and recreational facilities (refer to Appendix A). As a result, alternative locations for some buildings are shown on the Interim Master Plan drawings for consultation, within Zones 3 and 6.
- 5.3.15 The form and function of the visitor centre is yet to be fully defined, along with its location and scale. The building is currently shown in two alternative locations, one of which is indicated near the base of the reservoir embankment on the southern fringe of Zone 3. Similarly, the updated Interim Master Plan includes two possible locations for the education centre, one of which is within Zone 3 next to the proposed recreational lakes. Information regarding the

alternative building locations for the visitor centre and education centre, as well as the water sports centre, is set out as part of the description for Zone 6, in Section 5.6. The preferred locations of all of these facilities are subject to consultation in 2024.

### Car parking

- 5.3.16 In the Indicative Master Plan 2022, the main car park was located within Zone 2, to the north-east of the reservoir embankment and south-east of the siphon discharge channel. A second car park was also located on the north-eastern corner of the reservoir embankment. However, there were concerns that the reflective surfaces of the parked vehicles could detract from the views from surrounding higher ground, including the North Wessex Downs National Landscape to the south and limestone ridge to the north. As such, and as referenced under the main access road sub-heading, the main visitor car parking has been updated for the Interim Master Plan and is now located at the base of the north-eastern corner of the reservoir embankment, where the embankment protrudes slightly further east. This is because it is considered likely that the embankment could help to screen much of the car park in views from the North Wessex Downs National Landscape and the location is also likely to have more limited intervisibility with the limestone ridge to the north compared with the previous main car park location. At the same time, the car park would be well situated to offer access to the reservoir embankment and recreational facilities associated with the reservoir, as well as PRow and permissive paths within the surrounding landscape, including along the nearby eastern watercourse diversion.
- 5.3.17 The main car park has been conceptually designed in two parts, a hardstanding section for use throughout the year, and a reinforced grass overflow car park to accommodate seasonal peaks. Visitors would be encouraged to access the reservoir crest from the main car park using the proposed PRow or permissive paths or the access road which traverse the embankment. For disabled car parking on the embankment crest, see Section 5.6. Further work will be undertaken in 2024 to review likely visitor numbers and the car parking allowance will be reviewed in the next iteration of the Master Plan.
- 5.3.18 A smaller car park is proposed at the recreation area located adjacent to the recreational lakes, to provide parking for visitors to the education centre and potential angling and swimming facilities. It is thought that this car park would comprise hardstanding, including some spaces for cars and space to accommodate coaches for visiting school trips.
- 5.3.19 The pumping station and other operational buildings would require a car park for up to 30 spaces. This car park would need to be secure to allow access only to staff and designated visitors.
- 5.3.20 Other car parks are proposed as part of the Interim Master Plan in Zones 1, 5 and 6.



### Environmental bunding

- 5.3.21 The Indicative Master Plan 2022 was developed on the assumption that there would be an environmental bund for potential noise or visual screening located to the east of the main access road to SESRO during construction, near the north-eastern corner of the proposed reservoir embankment. Some permanent environmental bunding was also indicated to the west of the A34 near Drayton.
- 5.3.22 Review of the bunding has confirmed that the bunding near the north-eastern corner of the proposed reservoir embankment is not required for noise or visual screening during construction or operation. Instead, it is proposed to extend the permanent environmental bunding along the A34 in order to provide further noise and visual screening for visitors to the indicative location for SESRO, from traffic associated with the A34. The bunding would also provide some lower-level screening of views from the north-western fringe of Drayton towards construction activities for SESRO. There is potential for this visual screening to be further enhanced by possible planting on the bunding as soon as it has been constructed.
- 5.3.23 Indicative earthworks for the bunding have been developed. However, further work is required to optimise the height and extent to ensure that there are no conflicts with utilities to be retained or proposed, and to confirm that any significant impact on highway drainage associated with the A34 is prevented. Detailed design development will also need to ensure that the bund construction methods are appropriate to the adjacent A34.

### Landscape and biodiversity habitat design

- 5.3.24 The landscape and biodiversity habitat design in Zones 2 and 3 has been reviewed to align with the design changes discussed above, including changes to recreational and operational facilities, the main access road alignment and changes to the eastern watercourse diversion and corridor for the potential future canal. One of the most noticeable resulting changes is the reduced extent of the indicative location for SESRO to the east of Marcham, due to the proposed alignment of the main access road tying into the A415 Marcham Road closer to the A34 than in the Indicative Master Plan 2022. Therefore, environmental mitigation is not anticipated to be required in the vicinity of Sandford Brook. In addition, the design has been reviewed and updated as described below.
- 5.3.25 Further wet and other woodland has been incorporated, due to a deficit of woodland habitat in the Indicative Master Plan 2022, to mitigate for the loss of existing woodland. The additional wet woodland areas have been designed within areas of floodplain and/or to be associated with the eastern watercourse diversion. The woodlands have also been designed to aid landscape integration and to be appropriate to the existing landscape character, informed by the overarching and zone-specific Design Principles for SESRO set out in document J696-AA-ZZZZ-ZZZZ-RP-ZD-100001.

- 5.3.26 Additional hedgerows have also been incorporated in response to overarching and zone-specific Design Principles for SESRO, to better integrate the proposals with the surrounding landscape pattern and to address a deficit of hedgerows in the Indicative Master Plan 2022 to mitigate for the loss of existing hedgerows. The position of hedgerows along the main access road have been adjusted to ensure that there is sufficient offset for large standard trees to be included within the hedgerows, as well as space for wide grass verges and ditches. This is also in response to the zone-specific Design Principles for SESRO.
- 5.3.27 In conjunction with the update of the design of the eastern watercourse diversion, new areas of wetland habitat mosaic have been incorporated within the watercourse corridor, extending further south than in the Indicative Master Plan 2022.
- 5.3.28 Following the relocation of the indicative site for the education centre, wildlife ponds and scrapes have been added along a new nature trail from the centre, leading towards the western watercourse diversion and associated wetland habitat mosaic. It is envisaged that these ponds and scrapes could be used for educational activities, such as pond dipping (catching and studying pondlife).
- 5.3.29 The design of the settlement ponds originally required during construction has been refined to form lakes for recreational activities, potentially including angling and swimming, and with spaces between the two lakes that could be used as picnic or barbeque areas. The lakes have been designed to align with the indicative requirement for the settlement ponds to have surface areas of 10 hectares for construction, but to make them appear more natural, both in terms of their shape and by the addition of marginal habitat and wet woodland. Further stakeholder engagement will be required to confirm the proposed uses of these lakes, as there are likely to be conflicting interests relating to recreational and biodiversity functions, and safety considerations also need to be accounted for, ensuring that robust procedures are followed if swimming is allowed.
- 5.3.30 Both swimming and angling can cause disturbance to wildlife and angling often leads to an expectation of lakes being stocked with fish, which can have an adverse effect on native fish populations and amphibians. It is noted that swimming is not generally permitted at other Thames Water reservoir sites, although one off swimming events have sometimes been hosted, for instance at Farmoor, and the proposed recreational lakes would not be part of the main reservoir.

## 5.4 Zone 4

### Eastern watercourse and ditch diversions

- 5.4.1 As part of the Interim Master Plan development process various infrastructure elements changed compared with the Indicative Master Plan 2022 (refer to Appendix A), allowing the eastern watercourse diversion and various ditches in

Zones 2 and 3 to be realigned and a less constrained alignment to be formed. As part of this, the alignment of the whole length of the eastern watercourse diversion in Zone 4 was also refined and updated to incorporate more natural meanders where there is space for this. In conjunction with this, a 30m wide corridor was set aside for the eastern watercourse diversion to allow for a suitable riparian buffer and space to develop a suitable area that the new channel could flood within a controlled area allowing the watercourse to function more naturally.

#### Environmental bunding

- 5.4.2 The Indicative Master Plan 2022 included proposed permanent environmental bunding within Zone 4, located along the A34 and to the north-west of Steventon. It also assumed that some additional bunding would be installed during construction to be removed at the end of construction, where the bunding is not considered to be required for noise or visual mitigation during operation. While this approach to the environmental bunding has not been changed since Gate 2, the 3D modelling of the bunding has been further refined to improve the tie-in with the existing topography. Going forward, the nature of the environmental bunding, whether it is proposed for construction only or as a permanent feature, will be kept under review in conjunction with the EIA and as further detail around the construction phasing is developed.

#### Landscape and biodiversity habitat design

- 5.4.3 The landscape and biodiversity habitat design in Zone 4 has been reviewed to align with the design changes to the eastern watercourse diversion. In conjunction with this, new areas of wetland habitat mosaic and wet woodland have been incorporated within the watercourse corridor. The design of proposed wildlife ponds and scrapes proposed along nature trails associated with the watercourse corridor has also been refined.
- 5.4.4 In addition, a number of new great crested newt (GCN) habitat ponds have been incorporated into the design to the north of Steventon and west of Drayton within Zone 4. Further GCN habitat ponds are also proposed within Zone 5, as discussed in Section 5.5. Together, these ponds are proposed to provide compensation for the loss of an estimated ten existing ponds within the indicative location for SESRO. This compensation strategy is in line with the requirements for ponds to be mitigated at a ratio of four ponds to every pond lost as specified by NatureSpace under the GCN District Level Licensing (DLL) scheme. Further work is required as the design progresses, to confirm the number of ponds and wet ditches to be impacted and if there would be additional impacts on ponds/ditches to be retained, such as changes to groundwater, which would necessitate a larger number of compensation ponds.
- 5.4.5 NatureSpace recommend that the proposed ponds should be naturally colonised by vegetation, rather than be planted, and that the area of each pond should be no less than 100m<sup>2</sup>. The aquatic compensation habitat would need to

be constructed at least six months prior to the removal of any existing ponds and the location of these ponds are, therefore, indicated in areas where it is thought that the construction works could accommodate them. However, their locations should continue to be reviewed in conjunction with the development of the construction phasing programme to confirm this. The GCN habitat ponds have also generally been located away from PRow or permissive paths, to reduce potential disturbance, and outside of the floodplain. In addition, once impacts to GCN terrestrial habitat (habitats located less than 500m from a GCN waterbody) have been identified, terrestrial habitat compensation will be required to be developed (e.g. grassland, scrub, woodland and hedgerow). During detailed design, the GCN pond and terrestrial habitat design will need to be developed to meet the guidelines of the Freshwater Habitat Trust, Amphibian and Reptile Conservation, and Froglife. The design will also need to be agreed with Natural England.

- 5.4.6 In addition to the wet woodland along the eastern watercourse diversion, other woodland has also been incorporated into the design, including a large area of woodland with glades located to the west of B4017 Steventon Road, on the opposite side of the road to the existing Steventon Community Woodland. This has resulted in an increase to the extent of the indicative location for SESRO and has been incorporated to improve the woodland habitat connectivity between the site and the surrounding area and to help address a deficit of woodland habitat in the Indicative Master Plan 2022 to mitigate for the loss of existing woodland. The woodlands have also been designed to aid landscape integration and to be appropriate to the existing landscape character, informed by the overarching and zone-specific Design Principles for SESRO.
- 5.4.7 Additional hedgerows have been incorporated in response to overarching and zone-specific Design Principles for SESRO, to better integrate the proposals with the surrounding landscape pattern and to address a deficit of hedgerows in the Indicative Master Plan 2022 to mitigate for the loss of existing hedgerows.

## 5.5 Zone 5

### Steventon to East Hanney road diversion

- 5.5.1 The Steventon to East Hanney road diversion is one of the design elements for SESRO that have been appraised, as explained in Appendix A. The preferred alignment for the road diversion is the same as the alignment shown on the Indicative Master Plan 2022.
- 5.5.2 The road diversion would need to be constructed before certain construction works commence for the reservoir to ensure continued accessibility between Steventon and East Hanney, including existing bus routes.
- 5.5.3 The diversion is raised on an embankment approximately 600mm above the existing ground level to account for the sub-base and various construction layers of the road, and to allow the road surface to drain. The road diversion is raised slightly higher where it needs to cross the corridor to reserve space for

the potential future Wiltshire and Berkshire Canal. The road diversion includes a segregated footway to the north and a cycleway to the south, each separated from the two-lane single carriageway by a grass verge.

### Recreational provisions

- 5.5.4 Due to the location of the Steventon to East Hanney road diversion within Zone 5, the key recreational provision included within this zone are segregated foot and cycleways along the road diversion, as other recreational provisions are better located away from the road corridor. The proposed foot and cycleways would integrate with existing PRow that provide connections to routes to the south of the Great Western Main Line railway. It is envisaged that the new walking/wheeling and cycling provisions along the road diversion would improve access to active travel options between Steventon, East Hanney and Grove, as the existing road between Steventon and East Hanney does not include any walking/wheeling or cycling provision, and the new route has the potential to be used by walkers/wheelers and cyclists for commuting, leisure and other travel purposes.
- 5.5.5 As part of the design development for the Interim Master Plan, consideration was given to potential options for proposing additional cycle route or PRow extensions to improve the connectivity to existing national walking and cycling routes in the wider landscape, such as National Cycle Network Route 5 and The Ridgeway National Trail. Whilst possible opportunities for this have been identified, such routes would extend far beyond the indicative location for SESRO, and it would be unlikely that their inclusion as part of the project could be justified. As such, this has not been incorporated as part of the Interim Master Plan. However, such opportunities will be considered further in conjunction with further work and review of the road and access for the project, and in conjunction with discussions with local stakeholders and partners.

### Car parking

- 5.5.6 The proposed car park arrangement within Zone 5, as illustrated on the Interim Master Plan, has not been changed from that illustrated on the Indicative Master Plan 2022. A minor car park (including disabled bays) is proposed at the base of the reservoir embankment just outside of Steventon. This is intended to be for use by residents from the nearby villages to enable parking and pedestrian access to the reservoir site. The method of controlling access to the car park by locals only is yet to be determined.
- 5.5.7 Access would be provided from Steventon to the east, using part of the existing Hanney Road, which would be left after construction of the proposed Steventon to East Hanney road diversion to the south. The rationale for retaining this section of road at Gate 2, was that it would enable an alternative access point for operational vehicles to the access track around the base of the reservoir embankment (refer to Appendix C) and, in conjunction with this, it was considered appropriate to also include provision for a minor car park for local

access. As the changes to the layout of key infrastructure as a result of the recent options appraisals (refer to Appendix A) has not affected this arrangement, it has been retained as part of the Interim Master Plan.

- 5.5.8 As part of the Interim Master Plan design development, consideration has also been given to the possibility of incorporating an additional car park within Zone 5, to allow visitors from the local communities to the south/south-west, such as Grove and Wantage, to access the indicative location for SESRO, without driving through neighbouring villages to the main access road and associated car park to the north. Consideration was given to whether the material handling area for the rail sidings could be reused for this purpose. However, this would mean that visitors would also have to cross the proposed Steventon to East Hanney road diversion in order to gain access to the PRow and permissive paths surrounding the proposed reservoir and associated embankment. As such, it is considered that a small linear car park surrounded by planting located alongside the northern edge of the road diversion may be appropriate, as this could provide easier access to the proposed PRow and permissive paths, including to routes in the vicinity of the eastern watercourse diversion.
- 5.5.9 Further multi-disciplinary work is required to fully establish if there is a strong case for inclusion of car parking in this location and, if so, the optimal location and layout. As this would be a public highway, there will need to be further engagement with Oxfordshire County Council Highways Authority. Therefore, such a car park has not been illustrated on the Interim Master Plan. If feedback from stakeholders and the public supports inclusion of a car park, further consideration would need to be given to the optimal location, giving consideration to both access for visitors as well as other considerations, such as views from the North Wessex Downs National Landscape.

#### Environmental bunding

- 5.5.10 Permanent environmental bunding is proposed to the east of the Steventon to East Hanney road diversion, near the western side of Steventon. This bunding is intended to provide both noise and visual screening during construction but is also considered appropriate to be retained long term to provide screening of traffic on the road diversion. The position and contours of this bunding has been refined since Gate 2 to be more sensitive to the surrounding landscape context as part of the Interim Master Plan.

#### Eastern watercourse and ditch diversions

- 5.5.11 As stated previously, the whole length of the eastern watercourse diversion was updated following other Interim Master Plan design development. This included refinements and updates of the eastern watercourse alignment, and connecting watercourses/ditches, in Zone 5. In updating the Interim Master Plan, a 30m wide corridor was set aside for the eastern watercourse diversion to allow for a suitable riparian buffer and space to develop a suitable area that the new channel could flood into allowing the watercourse to function more naturally.



The upstream extent of the eastern watercourse diversion was also extended in Zone 5 towards the west to ensure clear drainage paths between the eastern and western watercourse diversions.

#### Landscape and biodiversity habitat design

- 5.5.12 The landscape and biodiversity habitat design in Zone 4 has been reviewed to align with the design changes to the eastern watercourse diversion. In conjunction with this, new areas of wetland habitat mosaic have been incorporated within the watercourse corridor.
- 5.5.13 The design has also been revised to reflect that woodland within The Cuttings and Hutchins Copse Local Wildlife Site (LWS) is no longer anticipated to require removal, due to a change to the preferred rail siding location, as explained in Appendix A. Furthermore, additional woodland has been proposed between the Great Western Main Line railway and the Steventon to East Hanney road diversion to increase the woodland habitat in the vicinity of The Cuttings and Hutchins Copse LWS. This has also been proposed to help address the deficit of woodland habitat in the Indicative Master Plan 2022 to mitigate for the loss of existing woodland. The additional woodland has been designed to aid landscape integration and to be appropriate to the existing landscape character, informed by the overarching and zone-specific Design Principles for SESRO.
- 5.5.14 Another key update to the Interim Master Plan is the proposed inclusion of a number of additional water bodies, including both general wildlife ponds, scrapes and pools to the east, and further GCN habitat ponds to the east and west of the existing floodplain. As explained in Section 5.4, the GCN habitat ponds are proposed to provide compensation for the loss of an estimated ten existing ponds within the indicative location for SESRO and would need to be constructed at least six months prior to the removal of any existing ponds. The locations of these ponds are, therefore, indicated in areas where it is thought that the construction works could accommodate them. Refer to Section 5.4 for further detail regarding the constraints and requirements relating to the GCN habitat ponds.
- 5.5.15 Additional hedgerows have also been incorporated in response to the overarching and zone-specific Design Principles, to better integrate the proposals with the surrounding landscape pattern, and to address a deficit of hedgerows in the Indicative Master Plan 2022 to mitigate for the loss of existing hedgerows. With respect to the proposed hedgerows along the Steventon to East Hanney road diversion, consideration was given to re-positioning the hedgerows between the carriageway and proposed foot and cycleways to provide separation from vehicular traffic. However, due to the many other constraints and features proposed within Zone 5, including the eastern watercourse diversion, it was concluded likely that there would be insufficient space for this. Furthermore, 'natural surveillance' of these routes would also be reduced if the foot and cycleways were located behind hedgerows, which could



affect the sense of safety and security for potential users of this route, particularly at night. As such, the hedgerow arrangement has been left similar to that illustrated on the Indicative Master Plan 2022. However, a grass verge has now been incorporated between the proposed carriageway and cycleway to provide some separation.

## 5.6 Zone 6

### Shape of the reservoir waterbody

- 5.6.1 In response to the Indicative Master Plan 2022 and subsequent technical engagement, the SESRO Landscape and Visual TLG made comments regarding the shape of the reservoir, suggesting that a *'regular shaped and otherwise visually highly engineered and artificial reservoir must be avoided'* and that consideration should be given to *'how a 'natural' and organic shape can be produced'* (refer to Appendix B). In follow up to this, the shape of the reservoir was discussed further with the stakeholders during the site visit on 22 November 2023 and the Master Plan workshop on 11 December 2023 (see Appendix A). The rationale for the shape of the reservoir is set out in the SESRO Option Appraisal Context and Methodology Report (J696-DN-A01A-ZZZZ-RP-ZD-100006), summarised as follows.
- 5.6.2 The overall shape of the reservoir in plan is roughly that of a parallelogram with rounded corners. The shape has been developed through consideration of the project requirement to deliver 150Mm<sup>3</sup> of reservoir storage, and a constraints assessment. The site is physically constrained by the existing roads, railway and River Ock, and the location of the reservoir footprint within these constraints is also constrained by the underlying geology of the site. For further information see the SESRO Option Appraisal Context and Methodology Report (J696-DN-A01A-ZZZZ-RP-ZD-100006).
- 5.6.3 The curvatures introduced within the crest alignment provide a more natural visual waterline than straight embankment alignments with more acute corners.
- 5.6.4 Due to the geological and site constraints set out above there is limited opportunity to adjust the shape of the reservoir and the shape of the waterbody has not been changed since Gate 2 in the Interim Master Plan. However, opportunities to create some variations will be explored as part of the ongoing design development work in 2024, following workshop comments from Natural England requesting consideration of variation in the edge *'between the land and the water – especially the northern side which appears noticeably smoother'* (refer to Appendix A). As engineering work to further refine the embankment shape and structural fill is ongoing, this needs to be progressed prior to consideration of how to increase the variation along the reservoir land and water boundary.

### Sub-division of the reservoir for recreation and biodiversity habitat

- 5.6.5 The Indicative Master Plan 2022 was developed on the basis of the following

internal sub-division:

- Water sports and other visitor facilities, such as a café to the east.
- Quieter recreational area with biodiversity focus to the west.
- Transition to the north and south, between the more intensive recreational area to the east and biodiversity focus to the west, incorporating indicative vantage points with seating to allow visitors new views towards the North Wessex Downs National Landscape to the south and limestone ridge to the north.

5.6.6 Further consideration of this as part of the Interim Master Plan development and discussions with stakeholders, following feedback from the Landscape and Visual TLG in July 2023 (refer to Appendix B) and during the stakeholder Master Plan workshop in December 2023, has confirmed the rationale for this approach. However, this concept will continue to be reviewed and refined in conjunction with work to address feedback from other stakeholder workshops and engagement as part of the ongoing design development work in 2024 (refer to Section 7.2).

#### Floating islands

- 5.6.7 Floating islands are an effective way to improve biodiversity through habitat creation within the reservoir whilst contributing positively to the visual amenity of the reservoir and softening its appearance in views from elevated areas in the surrounding landscape, without impacting water storage volume.
- 5.6.8 The Indicative Master Plan 2022 indicated proposals for floating islands along the southern and south-western sides of the reservoir waterbody, located between the contours of the inner embankment toe and the start of the borrow pit excavation. This is to prevent the floating islands from becoming stuck or overturned on sloping ground when the water-levels in the reservoir drop during drier periods. The rationale for the positions of the floating islands to the south and south-west was based on this being the area where wind and associated wave action is anticipated to be reduced compared with other parts of the reservoir, based on the prevailing wind direction.
- 5.6.9 As part of the work on the Interim Master Plan, consideration has been given to whether the floating islands could be extended to other locations around the reservoir, especially towards the north, in order to help to soften views of the northern side of the reservoir, which is likely to be the most visible edge of the reservoir in views from the North Wessex Downs National Landscape, as suggested by workshop feedback received from Natural England (refer to Appendix A). Based on review of the prevailing wind directions and resulting potential wave heights, the floating islands have been rearranged to extend from the south up to the north-western corner of the proposed reservoir. It is proposed that further advice is to be sought from a floating island construction specialist, to help ascertain whether the floating islands could potentially withstand the higher wave action anticipated to the north and to further develop

the proposals for the floating islands. This will be informed by further design work proposed around confirming wind and wave activity for the proposed reservoir, to inform erosion protection works and freeboard.

- 5.6.10 The intention is for the shape of the islands to look as natural as possible, avoiding straight edges and an overly engineered appearance. A varied shape, including creation of open areas within islands, would offer refuge and shelter while providing visual interest. The islands would be planted with locally appropriate species that take account of the wildlife/birds that would be attracted to the reservoir. As the Master Plan develops, further work will be undertaken to refine the size, shape and location/arrangement of the islands, as well as anchoring techniques, resilience to wave action and to address safety considerations.
- 5.6.11 As a precautionary approach, and as it is anticipated the floating islands would comprise several smaller individual 'floating rafts', only 50% of the areas indicated for floating islands have been included in the interim BNG calculations (refer to Chapter 6).

#### Reservoir towers

- 5.6.12 The reservoir would require towers to be constructed within the waterbody to enable water to be discharged into the reservoir and abstracted from it. The Indicative Master Plan 2022 included a main tower and two secondary towers. The structural core of these are proposed to be vertical reinforced concrete towers, octagonal or circular in plan, which would be largely submerged when the reservoir is full, the outer façade of the towers is yet to be determined. Each tower would support a platform at the top, at the same elevation as the embankment crest. A small building is to be constructed on this platform on each tower to house the control equipment for the valves and penstocks which control the flows in each tower. The appearance of these buildings is yet to be determined.
- 5.6.13 The main tower is proposed at the northeast corner of the reservoir, at the end of the tunnel which passes under the perimeter embankment to the buried pumping station at the outer toe. This tower would be situated around 200 to 250m south-west of the north-east corner of the embankment crest. It is envisaged that operational access to the tower would only be via tunnel, so there would be no bridge from the embankment crest to the tower.
- 5.6.14 One or two secondary towers are also to be constructed to provide alternative locations for abstraction of water from the reservoir in case of spatial variation in water quality in the reservoir. The number of towers and their locations are to be determined by water quality modelling. The tower(s) would be located within the central trench of the reservoir. The closest location of a secondary tower to the embankment crest would be around 500m from the southwest corner of the reservoir. It is envisaged that operational access to the secondary towers would only be by boat, so the towers would require stairs or ladders/platforms on their

outer wall (largely submerged when the reservoir is full).

- 5.6.15 Further work is required during design development in 2024 to determine if the number of secondary reservoir towers can be reduced from two to one, and to consider the architectural approach to the towers in line with the landscape context and SESRO Design Principles. As such, the number, arrangement and aesthetics of the towers have not been amended at this stage within the Interim Master Plan.

#### Renewable energy

- 5.6.16 The Indicative Master Plan 2022 included the installation of energy recovery turbines, housed in the buried pumping station box, which would generate electricity when water is released from the reservoir to the river. The turbines will be selected for efficiency during releases from the most common reservoir operational water level range, that is when the reservoir is largely full. When the reservoir level is very low there would be insufficient difference in water levels between reservoir and river to enable generation.
- 5.6.17 The possible inclusion of floating solar panels is being considered as part of the next iteration of the Master Plan, but is not currently included within the Interim Master Plan. Further review of the possible inclusion of renewable energy generation options on-site, including solar arrays on the reservoir, will be undertaken during the design development work planned during 2024, including in response to feedback from the SESRO Landscape and Visual TLG (refer to Appendix B). This review will explore how renewable energy could potentially mitigate carbon emissions, whilst accounting for site constraints and considerations such as landscape, views, recreation and BNG.

#### Internal edges of reservoir water body

- 5.6.18 The SESRO Landscape and Visual TLG have provided comments regarding the edges of the reservoir water body, in particular the drawdown zone, requesting that consideration should be given to how to incorporate shallow water and reed beds, as well as considering the views from the North Wessex Downs National Landscape (refer to Appendix B). In follow up to this, the edge treatment has been reviewed, as set out below.
- 5.6.19 It is imperative that the clay forming the perimeter embankment is protected from erosion by waves which develop on the water surface during extreme wind events. Such protection is commonly provided at reservoirs using a layer of interlocking and sufficiently heavy blocks (of stone or concrete). Common alternative systems use smaller stones which are bound together using cement (forming a concrete slab or mortar-bedded masonry revetment) or bitumen (forming an asphalt).
- 5.6.20 The SESRO design includes a protection layer on the entire embankment inner face formed of riprap, i.e., interlocking natural stone. The stone size varies around the perimeter, with the largest stones required on the north-east and

eastern sides given prevailing wind directions. The stone size also varies vertically, with smaller stones used on lower elevations of the embankment face where the slope is more gentle and fetch distance smaller. At some locations, such as at the water sports centre, concrete steps or ramps would be provided on the inner face instead of riprap to facilitate access to the water.

- 5.6.21 An alternative protection system using a vegetation-reinforced matting was considered. Such systems are commonly used to enhance erosion resistance of ground subject to flow, e.g., on riverbanks. This option was discounted due to concerns about the robustness of the system in response to waves (which can wash smaller soil particles through matting fabrics) especially with varying water levels (which can lead to the failure of any vegetation established on the matting). As such, it is not considered practicable to incorporate marginal planting, such as reed beds, around the reservoir waterbody in general. However, wetland lagoons with marginal planting are proposed as part of the western edge treatment of the reservoir, as explained below. In addition, as set out above, floating islands are proposed which would help to soften the appearance of the reservoir in views from elevated areas such as the North Wessex Downs National Landscape.
- 5.6.22 It may also be possible to vary the colour of the riprap stone used around the inner face through sourcing the stone from multiple quarries, in order to help to soften the visual appearance of the riprap and to make it appear less uniform in views from the North Wessex Downs National Landscape. The sourcing of stone from more than one quarry may be preferred, in any case, given the range of stone sizes required, however, such sourcing practice may increase costs and transport distances. The riprap stone must be sufficiently strong and durable not to weather or degrade during operation of the reservoir, but there is a variety of rock types available within the UK which could be used for riprap. Further work is required to consider the practicality and visual effect associated with specification of a variety of coloured stones for the riprap, as the stone is likely to weather in response to rising and falling water levels, which in turn may affect its visual appearance.

#### Wetland lagoons

- 5.6.23 The Indicative Master Plan 2022 included wetland lagoons to be formed along the western side of the inner face of the embankment. The lagoons would improve biodiversity through habitat creation and connectivity on the western side of the reservoir, whilst contributing positively to the visual amenity of the reservoir and softening its appearance. At this location, the perimeter embankment crest is largely separated from the main waterbody by a series of thin (approximately 15m wide), vegetated islands with wet woodland aligned parallel to the perimeter embankment crest alignment. The lagoons would be formed between the perimeter embankment crest and islands, and connect to the main reservoir via channels between the islands.
- 5.6.24 The bed of the channels would be formed so they are slightly below reservoir

water level at full capacity. The base of the lagoon would be formed to be deeper than the base of the inter-island channels. This is to ensure that, during reservoir operational drawdowns, the water in the lagoon would be retained at the level of the base of the inter-island channels.

- 5.6.25 As the lagoons would be protected from wave action by the islands with wet woodland, their inner faces do not need to be protected by riprap and a softer solution such as a vegetated matting system with marginal habitat is proposed to be installed.
- 5.6.26 The inclusion of lagoons within the Master Plan requires the embankment to be wider at these locations, increasing the clay fill volume and increasing the overall reservoir footprint. As such, it is not considered practicable to include lagoons as a general approach around the reservoir as a whole and the locations of the lagoons have been maintained within the Interim Master Plan. However, the illustration of the lagoons within the Master Plan has been refined to provide a better indication of the arrangement of marginal habitat and wet woodland.

#### Buildings and ancillary infrastructure on the reservoir embankment

- 5.6.27 The SESRO Landscape and Visual TLG have provided comments regarding the design and siting of buildings and ancillary infrastructure, requesting careful consideration to avoid these forming detracting features, particularly in views from the North Wessex Downs National Landscape (refer to Appendix B). The initial feedback received during the workshops (see Appendix A) indicated a desire to make the buildings and infrastructure discreet, to fit into the surrounding context and make the design sustainable and practicable, rather than aiming to create features to stand out.
- 5.6.28 The reservoir must incorporate sufficient pipework to enable the water level to be drawn down at an appropriate rate during any emergency. To supplement the capacity provided by the main conveyance tunnel system, it is envisaged that further (auxiliary) drawdown capacity would be provided using an array of four siphon pipes which would be installed across the embankment at the north-eastern corner. These pipes would be buried by locally raising the dam surface along their alignment, using landscape fill on the crest and downstream shoulder.
- 5.6.29 The Indicative Master Plan 2022 included a café and sailing clubhouse buildings on the north-eastern corner of the reservoir embankment. As part of the Interim Master Plan, the buildings on the reservoir embankment include the same indicative café location as at Gate 2, while two possible options for the water sports centre are indicated, along with a possible alternative location for a combined visitor and education centre. The water sports centre is envisaged to provide opportunities for a range of non-motorised water-based recreational activities, such as angling and/or sailing (supported by a small number of electric motorised craft for access and safety). The architectural approach and



landscape integration of any buildings on the embankment will need to be explored further as part of the design development work in 2024, alongside addressing feedback from non-statutory consultation and wider stakeholder engagement and work on a planned benefits assessment.

#### Car parking

- 5.6.30 A small car park has been shown on the Interim Master Plan for the café on the embankment crest, for staff, deliveries and disabled access. A car park with disabled parking would also be required for the water sports centre. Control of vehicles driving to these buildings on the reservoir crest would be required at the toe of the reservoir embankment. The landscape integration of this car parking on the embankment and the number of parking spaces will need to be explored further as part of the ongoing design work in 2024, in conjunction with further stakeholder engagement.

#### Embankment earthworks design

- 5.6.31 The SESRO Landscape and Visual TLG have provided comments requesting review of the height, gradient and profile of the reservoir embankment, to ideally reduce and soften them (refer to Appendix B). In follow up to this, the embankment earthworks design has been reviewed, as set out below.
- 5.6.32 The perimeter embankment would have a minimum cross section determined by stability and stress analyses. Along much of the embankment, variation in the profile of the outer face would be provided by the further placement of landscape fill above the structural and stability fill, as illustrated on the Interim Master Plan Cross Sections in Appendix E. The landscape fill would consist of topsoil and subsoil which would be excavated from the SESRO site, but which are unsuitable for structural fill.
- 5.6.33 At some locations, landscape fill is proposed to be placed to locally raise the embankment crest. Apart from these locations, the crest is proposed to have a largely constant elevation around the reservoir perimeter, around 1-1.5m above the reservoir water level at full capacity. The height of the crest is to be determined following finalisation of the embankment design to allow for sufficient wave freeboard and settlement. Depending on the varying ground levels around the site, the embankment would be between approximately 15m and 25m high relative to the existing ground levels. There is no scope to reduce the height of the structural embankment, as this would require a larger footprint for the reservoir and the shape of the water body is constrained, as discussed above.
- 5.6.34 The embankment crest is proposed to have a minimum width of 8m (where not extended by landscape fill, such as for the wetland lagoons). It is envisaged that the crest would incorporate a paved track around the perimeter of the reservoir. This is likely to be asphaltic hard standing over part of its width (~3m), supplemented by an adjacent unbound stone pavement in some locations.



Along the north-east and eastern sides of the reservoir, a low (~600mm high) concrete wave wall may be installed along the inner edge of the crest, providing some separation from the riprap on the inner face and a seat for visitors.

- 5.6.35 The perimeter embankment has previously been subject to a preliminary design to determine the maximum slopes on its inner and outer faces. This is to be reviewed when further information is available from proposed ground investigations and clay compaction trials in 2024.
- 5.6.36 The preliminary design of the perimeter embankment identified the following slopes:
- The upper 6-10m of the inner face is to have a maximum slope of 1(V):4.5(H), with a gentler slope at lower elevations. Overall, the inner face of the embankment is expected to have an average slope of 1(V):6(H).
  - Where landscape fill is not placed, the upper part of the outer face would also have a maximum slope of 1(V):4.5(H). Overall, the outer face of the embankment is expected to have an average slope of 1(V):7.5(H).
- 5.6.37 As part of the updates for the Interim Master Plan, the embankment earthworks profile has been reviewed in conjunction with development of the landscape and biodiversity habitat design and in response to the overarching and zone-specific Design Principles for SESRO, as set out in further detail below. This has resulted in more variation in the gradients and profiles of the outer face of the reservoir embankment.

#### Embankment toe drain

- 5.6.38 A drain formed by an open channel is proposed around the outer toe of the reservoir embankment. This would receive any water discharging from the dam's internal drainage system and would also be designed to prevent unauthorised vehicular access onto the embankment (as noted in Appendix C). In the Indicative Master Plan 2022, the width of this was indicated to be 1.2m. The drain would have a very shallow gradient to enable water within it to flow but to avoid the drain being excessively deep (given the length of the toe drain). It is envisaged that the drain channel would be around 1.25-1.75m deep (depending on variations in topography), with a steep face on the embankment side (around 1(V):1(H) and a much shallower outer slope. This shape would enable the drain's function to prevent vehicles crossing it, whilst reducing the risk of people falling in and also enabling egress from the drain and its maintenance.
- 5.6.39 The toe drain would need to connect into the Landmead Ditch to the north as well as the eastern watercourse diversion. The most appropriate locations for these connections will need to be reviewed with regards to ground levels. Other small ditches around the reservoir are also proposed to drain into the toe drain.
- 5.6.40 A buried groundwater drain is also proposed at the reservoir. This is to be a

trench filled with gravel of varying depth (to suit the geology), which would intercept groundwater flows within the superficial deposits at the site (i.e., the materials below the topsoil and above the bedrock clays). The drain would convey such flows around the reservoir. This drain would be completely underground throughout its length.

- 5.6.41 Where they both occur i.e., to the south of the reservoir), the toe drain and groundwater drain would run in parallel and it is possible (but not essential) that the toe drain would be formed directly above the groundwater ditch, with a layer of clay in the base of the toe drain ditch to prevent loss of flow into the groundwater drain.
- 5.6.42 From an aquatic ecology perspective, it is assumed that there would be a flow in the toe drain for a minimum of four months per year. A range of emergent, submerged and floating-leaved plants, as well as aquatic marginal vegetation are likely to be incorporated into the toe drain design as part of detailed design.
- 5.6.43 To meet the vehicular restraint and ecology requirements for the toe drain, the total channel width is envisaged to be up to 5.5m (the 1.2m wide wet channel of the toe drain forms part of this). A hedgerow is proposed on the embankment side of the toe drain, around the embankment perimeter. To prevent undesirable shading the hedgerow centreline is proposed on the reservoir side of the toe drain, set back around 3 m from the toe drain. The hedgerow is not proposed to incorporate tree planting. The Interim Master Plan will need to be reviewed and updated to ensure that sufficient space is allocated for the width of the toe drain, as drainage requirements are confirmed.

#### Landscape and biodiversity habitat design of reservoir embankment

- 5.6.44 The Indicative Master Plan 2022 design of the reservoir embankments was based on a precautionary approach, providing mainly pasture for sheep grazing, with a limited area of species-rich neutral grassland indicated at the south-western corner of the embankment. Woodland planting was only indicated at localised areas of landscape fill along the embankment crest.
- 5.6.45 Further to feedback received from the SESRO Landscape TLG during 2023 (refer to Appendices A and B), and to respond to the overarching and zone-specific Design Principles for SESRO, opportunities for developing a solution that would allow more planting on the embankment were explored. It was subsequently agreed that planting could be added in areas where the landscape fill would be a minimum of 2m depth. The embankment earthworks design was then reviewed to identify locations where it would be feasible to subtly amend the earthworks to allow the planting of hedgerows and woodland belts and copses, to integrate the embankments into the surrounding landscape, in an approach informed by the overarching and zone-specific Design Principles for SESRO.
- 5.6.46 The Interim Master Plan planting and earthworks proposals have also been designed to improve biodiversity, habitat connectivity and align woodland belts

traversing the embankment, with gentle undulations and dips in the earthworks. This reflects the pattern of the surrounding landscape where woodlands are often located in areas of undulating ground where arable farming has not been introduced. This is most noticeable along the scarp of the North Wessex Downs National Landscape, where 'woodland hangers' are often associated with dry coombes (dry valleys/hollows on the scarp) and are also a feature on more subtly undulating ground.

- 5.6.47 Further consideration of the planting proposals will be required as part of the detailed design, including the selection of locally appropriate species to reduce the risk of wind throw and root growth affecting the structure of the embankment. Measures to deter badgers from burrowing into the embankment, potentially using underground netting and/or overground fencing, will also need to be considered.

## 5.7 Zone 7

### Intake/outfall structure and control building

- 5.7.1 The siting of the intake/outfall structure and control building was one of the elements of SESRO to be appraised, as explained in Appendix A, and this has resulted in a change in location compared with the Indicative Master Plan 2022.
- 5.7.2 The preferred option for the intake/outfall structure is located along the right (western) bank of the River Thames, east of a flooded gravel pit, immediately upstream of the Culham Cut just north of the Jubilee Junction. The site would be accessed via the B4107, Stonehill Lane and Peep-O-Day Lane, utilising a single location for the intake, outfall and combined shaft and control building. This location is slightly further north than the option which was presented on the Indicative Master Plan 2022.
- 5.7.3 One of the outfalls from the existing Abingdon Sewage Treatment Works (STW) would need to be extended so that it discharges further downstream of the proposed inlet. For this reason, the Abingdon STW is highlighted on the Master Plan as works may be necessary within the STW to facilitate the extension of the outfall.
- 5.7.4 The intake and outfall would be connected to a common shaft and tunnel linking to the SESRO pumping station. A control building would house the operational equipment and controls required. The design and aesthetics of the building are still to be developed.
- 5.7.5 There would be screens on the intake, in common with other intakes on the River Thames, to reduce intake of debris to the reservoir and prevent harm to fish. Further work will confirm the design of the screens. The outfall structure would be located adjacent to the intake and be designed to discharge water from the reservoir in the direction of the river flow to prevent disturbance to river craft or the riverbed and banksides. Further work will confirm any additional mitigation requirements to account for the loss of natural riverbank.

### Conveyance Tunnel and Emergency discharge arrangement

- 5.7.6 A conveyance tunnel would connect the intake / outfall structure to the SESRO pumping station and be used to transfer water abstracted from the River Thames to the reservoir and from the reservoir back to the river.
- 5.7.7 In the Indicative Master Plan 2022 there was an additional above ground ADC for emergency drawdown of the reservoir within Zone 7. As explained in Chapter 2, the emergency drawdown arrangements for the project have been subject to option appraisal (set out in further detail in Appendix A), which concluded that an emergency discharge arrangement utilising the proposed conveyance tunnel only is preferred. The tunnel only option reduces engineering complexity, reduces land take and generally reduces environmental impacts. As such, the Interim Master Plan has been updated to omit the ADC that was indicated on the Indicative Master Plan 2022.
- 5.7.8 The route of the conveyance tunnel in the Interim Master Plan remains similar to the tunnel route in the Indicative Master Plan 2022. From its starting location at the pumping station, it heads beneath the ground surface on a route north-east and past Drayton and then eastwards towards the River Thames and connects to the intake/outfall. As the intake/outfall structure is located north of the location used at Gate 2 as a result of option appraisal (refer to Appendix A), the tunnel alignment has been updated to accommodate this change. The key difference to the tunnel from the proposals in 2022 is that the tunnel is expected to be c.6m (internal diameter – ID) compared to 4.2m ID.

### Landscape and biodiversity habitat design

- 5.7.9 The Indicative Master Plan 2022 incorporated a proposed ADC with grassland and hedgerows indicated alongside the ADC and the landscape beyond the immediate ADC corridor indicated as returned to its existing use. The landscape and biodiversity habitat design for the Interim Master Plan has been updated to reflect the preferred below ground emergency discharge arrangement via the conveyance tunnel. The extent of the indicative location for SESRO has also been reviewed and amended to reflect this and to align with the assumed position and design for the intake/outfall structure, which has been amended since Gate 2, as discussed in further detail above.
- 5.7.10 The intervisibility with the River Thames and visual amenity of the Thames Path National Trail to the east of the river, have been key considerations for the design associated with the proposed intake/outfall structure and control building. As such, intermittent trees and shrubs are proposed along the riverbank, to reflect the character of existing riparian vegetation along the River Thames and to conserve the relative sense of tranquillity and remoteness along the river. Further work is required to refine this design, in conjunction with the architectural development of the structures.

## 6 Biodiversity Net Gain Analysis and Results

- 6.1.1 The approach to BNG for SESRO is set out in Section 3.5. The approach to the Interim Master Plan design (refer to Appendix D) aims to provide the most appropriate habitats, in the most appropriate locations, and then to subsequently confirm that the anticipated BNG requirements would be met. The Environment Act 2021 makes provision for Government policy to set out a biodiversity gain objective for projects requiring a DCO. The objective must be at least 10% (no further details are available at the time of writing). However, an initial assessment can be made using the latest version of the biodiversity metric and accompanying guidance, noting that these are applicable to developments consented through the Town and Country Planning route, rather than DCO.
- 6.1.2 The Interim Master Plan design has been landscape and environment led and seeks to offer an ambitious approach to habitat creation and biodiversity net gain for the SESRO project. The Master Plan will continue to be updated and developed as the project progresses to ensure all opportunities to significantly improve the site for wildlife are incorporated. This chapter sets out the BNG analysis and results, to confirm whether it is considered likely that at least 10% BNG can be achieved within the indicative location for SESRO.
- 6.1.3 The Interim Master Plan and associated post-development baseline were developed following a series of multi-disciplinary workshops and meetings, as explained in Chapter 3 and Appendix A. The Interim Master Plan was developed by the project team in computer-aided design software which was subsequently exported to geographic information system software to allow measurements of each habitat proposed to be created, retained or enhanced. These measurements were then inserted into the habitat creation or enhancement tab of the Statutory BNG Metric tool.

### 6.2 Limitations and Assumptions Baseline

- 6.2.1 The strategic significance was assessed as 'low' for all area habitats, linear hedgerow and watercourse features with the exception of watercourses that are designated Water Framework Directive (WFD) waterbodies, which are assessed as 'high'. This is because the site is not identified within the Oxfordshire County Council Conservation Target Area (CTA). In addition, Oxfordshire does not yet have a Local Nature Recovery Strategy (LNRS) which is a key document for assessing strategic significance for BNG metrics.
- 6.2.2 As previously stated in Section 3.5, the habitat types present on site, and their condition status, were based on partial site UK Habitat and Condition Assessment (UKHab) information, aerial imagery, other desk study information, such as the Ancient Woodland Inventory and Ancient Tree Inventory, and the geomorphic walkover survey limited to PRow at Gate 2. Full access to the site

was not available at the time of assessment. As such, a full assessment, including a habitat condition assessment and river condition assessment, could not be conducted. Conservative assumptions have therefore been made with respect to some of the habitats present on site and their condition. The assumed conditions for each habitat type are consistent across the indicative location for SESRO for habitat areas and hedgerows, where an accurate assessment could not be taken.

- 6.2.3 A precautionary approach was taken to determine the condition score of baseline habitats. For most habitats 'high' or 'moderate' condition was assumed unless the habitat was of 'low' distinctiveness, such as cropland or modified grassland.
- 6.2.4 Areas of woodland which could not be accessed or assessed thoroughly were categorised as LMDW and the condition was assumed to be 'good'. This is a precautionary approach as LMDW is a priority habitat and a habitat of 'high' distinctiveness.
- 6.2.5 For watercourses, all rivers were assessed to be in 'moderate' condition, and ditches in 'poor' condition aside from limited areas determined to be of higher condition as estimated from limited onsite walkovers (due to access constraints) and/or satellite imagery.

#### Habitat retention and creation

- 6.2.6 The strategic significance was assessed as 'low' for all area habitats, linear hedgerow and watercourse features created. The exception being watercourses that are designated Water Framework Directive (WFD) waterbodies, which are assessed as 'high'. This is because the site is not identified within the Oxfordshire County Council Conservation Target Area (CTA). In addition, Oxfordshire does not yet have a Local Nature Recovery Strategy (LNRS) which is a key document for assessing strategic significance for BNG metrics.
- 6.2.7 Due to the nature of the project, it is assumed at this stage, and for the purposes of this high-level biodiversity net gain assessment, that the majority of baseline habitats would be lost in areas where construction and excavation is undertaken and there would be limited opportunity for habitat retention and enhancement in these areas. Where habitat retention is feasible, this would likely be located around the perimeter of the site.
- 6.2.8 For the purposes of the BNG analysis, the total area indicated for floating islands within the proposed reservoir on the Interim Master Plan, has been halved, with the other area added to the total area for the reservoir as still water body habitat. This is because the floating islands would be constructed as a series of interlinking rafts which would be joined together, with some areas of open reservoir water likely present between the rafts.
- 6.2.9 A precautionary approach has also been taken with regards to the amount of



other neutral grassland ('good' condition) indicated to be created as part of the Interim Master Plan. This is because further soil survey and analysis is required to inform the proposals for grassland creation. Consequently, for the purposes of the BNG analysis, it has been assumed that the grassland areas indicated on the Interim Master Plan would comprise 50% modified grassland ('poor' condition'), including the areas indicated as pasture for sheep grazing, and 50% other neutral grassland.

- 6.2.10 The exception to this, is the area of other neutral grassland indicated within the footprint of the southern-most alternative indicative T2ST WTW and temporary compound location illustrated on the Interim Master Plan. For the purposes of the BNG calculations, this area has been assumed to be proposed hard standing, in order to assume the worst-case scenario.

### 6.3 BNG Results: Interim Master Plan with Below Ground Emergency Discharge Tunnel

#### Overall BNG Results

- 6.3.1 The total net percentage change in biodiversity for the Interim Master Plan with Below Ground Emergency Discharge Tunnel is 12.47% for habitat areas, 15.92% for hedgerows and 33.43% for watercourses. The basis of these results is summarised below.

#### Baseline Calculations

- 6.3.2 The indicative location for SESRO represents a total of 1726.66ha, equating to 4323.16 habitat area units. Linear features consisting of lines of trees, native hedgerow and native hedgerow with trees located within the indicative location for SESRO represent a total of 88.02km, equating to 403.24 hedgerow units. As a result of the project the majority of these habitats and linear features within the assessment area would be lost and new habitats created to avoid significant losses to biodiversity.

#### Habitat Loss

- 6.3.3 The total area of habitats lost is 1686.96ha, equating to 3915.14 habitat area units.
- 6.3.4 The most significant impact from the project would potentially be the loss of LMDW. The site potentially contains 45.51ha of this woodland type which has a precautionary condition assessment of 'good' and is assumed to be of high distinctiveness. Only 16.49ha of LMDW would be retained on site, primarily around the perimeter. This would lead to a loss of 522.36 units of this habitat.

#### Retained and Enhanced Habitats

- 6.3.5 Several habitat parcels would be retained as part of the project, totalling an area of 39.7ha equating to 408.02 habitat area units. Additional biodiversity



units can be obtained by enhancing retained habitats so this should be explored further once the full UKHab survey has been undertaken.

### Habitat Creation

- 6.3.6 The Interim Master Plan illustrates that the total area of habitats to be created is 1686.92ha, equating to 4454.31 habitat area units.
- 6.3.7 Habitat created would aim to integrate with the existing landscape and would be tailored to suit the physical and hydrological conditions of the site. Habitats created would be of significantly better quality for biodiversity than the previous predominantly arable landscape.
- 6.3.8 The proposed reservoir itself would be 651.17ha, which accounts for a large proportion of the indicative location for SESRO. The reservoir design would also include the provision of floating islands which would be beneficial to wildlife (3.54ha).
- 6.3.9 The focal point of habitat creation would be to establish a wetland habitat mosaic to the west of the reservoir, with some smaller areas of wetland habitat mosaic to the east (total area - 132.35ha). The wetland area would be a mosaic of wet woodland, neutral grassland, floodplain wetland mosaic and wet ditches and rivers. The goal would be to create a biodiverse wetland nature reserve to the west, providing habitat for numerous species of flora and fauna.
- 6.3.10 A significant proportion of the habitat units gained (2037.83) would be from the creation of species-rich other neutral grassland of 'good' condition. In addition, and as explained above, as a precautionary approach, some of the grassland habitat creation, including the pasture for sheep grazing, has been assumed to be modified grassland (470 habitat area units) of 'poor' condition. These habitats would be created within the wetland mosaic to the west of the reservoir but also on the embankments and within other grassland areas of the site.

### Hedgerow Loss

- 6.3.11 The total length of hedgerow, hedgerow with trees and lines of trees to be lost would be 73.63km, equating to a loss of 339.24 hedgerow units.

### Retained and Enhanced Hedgerows

- 6.3.12 The Interim Master Plan design indicates 8.1km of linear features to be retained and 6.29km enhanced within the indicative location for SESRO.
- 6.3.13 Hedgerows and tree lines which have been categorised as having a 'moderate' condition assessment for the baseline habitat would be enhanced to 'good' condition, where possible. This would be achieved through enhancement of sections of hedgerow where gaps are present or where plants have become sparse. This would also help to maintain connectivity across the site and accounts for 36.54 units of enhanced hedgerow.

### Hedgerow Creation

- 6.3.14 Species-rich native hedgerows and species-rich hedgerows with trees of 'good' condition are to be created within the indicative location for SESRO, covering a total length of 63.60km, equating to 394.99 hedgerow units. Hedgerows and tree lines would be planted in long, continuous lines where possible, principally adjacent to other linear features such as roads and access tracks, with the objective to help maintain habitat connectivity across the site. This would ensure wildlife would continue to be able to commute through the landscape and not become isolated from important foraging or breeding grounds.

### Watercourses

- 6.3.15 There are a total of 72km of watercourse, as mapped on Ordnance Survey River Network, that equate to 346 units within the baseline.
- 6.3.16 Whilst most watercourses would be lost within the indicative location for SESRO, 21km of watercourses would be retained in their current state, equivalent to 120 units. The Portobello Ditch, Cow Common Brook and East Hanney Ditch would be diverted to the west of the reservoir, the Mere Dyke to the east, and a river realignment of the River Ock would result in 18km of watercourse enhancement, equivalent to 240 units.
- 6.3.17 Over 22km of wetland ditches are also proposed to be created within the indicative location for SESRO. The total number of units delivered by the proposed wetland ditches is 100 units.
- 6.3.18 The net change is an increase in 116 units for watercourses, equivalent to 33.43% net gain. However, when split into individual habitat types, the net change in units is positive for rivers (increase in 138 units), but negative for ditches (decrease in 21 units). This means that habitat trading rules are currently not met as too few ditch units would be delivered. Refer to Section 6.4 for further information regarding this.

## 6.4 Trading Rules

- 6.4.1 Whilst the biodiversity gain requirements for the project are still unknown (see paragraph 6.1.1), consideration has been given to the Statutory BNG Metric 'Trading Rules'. Rule 1 sets minimum habitat creation and enhancement requirements to compensate for specific habitat losses, up to the point of 'no net loss'. The rules are based on the habitat type and distinctiveness of the habitat lost<sup>25</sup>. For habitats with a 'high' distinctiveness such as LMDW or rivers,

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<sup>25</sup> Defra (2024). The Statutory Biodiversity Metric: User Guide. Online. Available at: <https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides>. Accessed May 2024.

losses must be replaced with area habitat units of the same type.

- 6.4.2 On a precautionary basis all areas of woodland, that it has not yet been possible to survey, have been assumed to be LMDW of 'good' condition. The total area of LMDW on site was calculated as 45.51ha of which only 16.49ha would be retained. This equates to a loss of 522.36 units of habitat. An additional 62.96ha (79.73 habitat area units) of LMDW would be created on site. This leaves 442.63 habitat area units of LMDW which have not been accounted for in the metric. As there is limited space within the site to create 442.63 units of this woodland type and other considerations, such as landscape character, to be taken into account, this habitat would either need to be created off-site or habitat units bought to compensate for the loss to be able to meet the 'Trading Rules'.
- 6.4.3 It should be noted, however, that the areas of LMDW identified on site may be reclassified as a different woodland type once a full site survey has been undertaken; i.e. the assumption that all un-surveyed woodland is LMDW may not accurately represent the woodland habitats on site. Additionally, should the woodland habitats on site be found to be of lower distinctiveness or condition, the amount of habitat creation required would be reduced.
- 6.4.4 Consequently, the 'Trading Rules' for the loss of high distinctiveness habitat could not be met for habitat areas, resulting in Rule 1 not being achievable within the indicative location for SESRO. Further work is needed to identify the biodiversity net gain requirements for NSIPs; and to review the potential to increase woodland both within the site and off-site. Rule 1 also states that for watercourses, losses to 'medium' distinctiveness habitat types (i.e. ditches and canals) must be replaced with watercourse units of the same habitat type. As explained in Sections 6.3, the number of units that would be delivered by the proposed wetland ditches and toe drain would not outweigh the loss of units from ditches, despite an overall watercourse net gain of  $\geq 10\%$ . This means that the habitat 'Trading Rules' would not be met, as too few ditch units would be delivered. Additional wetland ditch creation within the indicative location for SESRO is recommended to meet the shortfall. In order to create the additional 21 ditch units required to meet the habitat trading rules, an estimated extra 4.7km of ditches would need to be created within the indicative location for SESRO. If this is not possible, off-site enhancement of existing ditches is suggested rather than the creation of new artificial land drainage ditches off-site. Another option would be to explore Rule 4 which may allow for deviations from the biodiversity metric trading rules<sup>25</sup>.

## 6.5 Loss of Irreplaceable Habitats

- 6.5.1 There are no ancient woodland blocks located within or directly adjacent to the indicative location for SESRO. At the time of writing this report, the Woodland Trust Ancient Tree Inventory indicates that there are a number of veteran and ancient trees located within the indicative location for SESRO (inventory checked on 30 April 2024). While it is proposed to retain the majority of these

trees, it is not considered practicable to retain one of the ancient trees, as it is located within the proposed reservoir footprint. In addition, further survey work is required to identify the potential presence of other ancient and veteran trees within the indicative location for SESRO. As ancient and veteran trees are considered irreplaceable habitat, mitigation for their loss is not possible and compensation cannot be provided on a 'like-for-like' basis or to achieve an overall negligible impact. A bespoke mitigation and compensation strategy would therefore be required and would be designed to make a contribution to biodiversity that is considered proportionate to the nature and extent of the likely loss or damage once this has been determined. Bespoke compensation, which may include a significant amount of tree planting, retention of soils and deadwood on site and tree cuttings, would be required and will need to be agreed with the Natural England and the Local Planning Authorities. A compensation strategy for the unavoidable removal of any ancient/veteran trees will be developed, in line with good practice guidance on ancient and veteran trees.

- 6.5.2 *'Irreplaceable habitats are habitats which are very difficult (or take a very significant amount of time) to restore, recreate or replace'. This is 'due to their: age, uniqueness, species diversity and rarity'*<sup>26</sup>. As such, these habitat types are not included within the BNG requirements. Loss of irreplaceable habitats cannot be calculated using the Statutory BNG metric tool and they are removed from the baseline. The project would result in the loss of at least one tree which is categorised as irreplaceable habitat representing a significant loss to biodiversity on site. However, the project would generate meaningful gains for other biodiversity features, such as through the creation of other neutral grassland, wetland habitat mosaic and wet woodland.

## 6.6 Summary

- 6.6.1 The BNG objective of the project is to achieve a minimum of 10% net gain in biodiversity value. Analysis of the BNG calculations concluded that although the Interim Master Plan could achieve a minimum of 10% net gain in habitats, hedgerows and watercourses through the creation of the reservoir, wildlife ponds, wetland mosaic, watercourse diversions, wetland ditches, woodlands and linear landscape features; all of the requirements of the BNG 'Trading Rules' would not be met. As such, achieving 10% BNG for the project within the indicative location for SESRO and in compliance with the 'Trading Rules' cannot be confirmed at this stage.
- 6.6.2 However, it should be noted that the baseline calculations are based on assumptions relating to habitat type and condition, owing to limited land

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<sup>26</sup> Department for Environment, Food & Rural Affairs (2024). Guidance, Irreplaceable habitats, How biodiversity net gain (BNG) applies to irreplaceable habitats. Online. Available at: <https://www.gov.uk/guidance/irreplaceable-habitats>. Accessed: May 2024.

access. Future work is proposed to be carried out which includes a full UK Habitat (UKHab), Condition Assessment and Modular River Physical Habitat (MoRPh) survey for all habitats within the BNG baseline. This would significantly improve the accuracy of the data and conclusions drawn from the calculations.

- 6.6.3 Furthermore, as SESRO meets all of the requirements to implement Rule 4 in the Metric<sup>25</sup> which applies in '*exceptional ecological circumstances*' (which includes river re-meandering), there may be scope for deviation from the biodiversity metric trading rules to be pursued.

## 7 Summary and Next Steps

### 7.1 Summary

- 7.1.1 The Indicative Master Plan 2022 for SESRO has been used as a starting point for developing the Interim Master Plan. Updates to the Master Plan have been made in response to:
- Multi-disciplinary options appraisals and internal design workshops for the configuration and layout of essential infrastructure elements of the 150 Mm<sup>3</sup> SESRO project to achieve a technical consensus of the preferred configuration within the physical constraints of the site, whilst still delivering the overall outcomes required by the WRMP<sup>8</sup>;
  - Project-specific landscape design guidance;
  - Expected BNG requirements;
  - SESRO draft Design Vision and Design Principles;
  - Multi-disciplinary engagement regarding design refinement; and
  - Stakeholder engagement, specifically stakeholders with an interest in landscape including representatives from Natural England, the North Wessex Downs National Landscape, Oxfordshire County Council, South Oxfordshire and Vale of White Horse District Council and the Environment Agency, which all are part of the SESRO Landscape and Visual TLG.
- 7.1.2 The output is the Interim Master Plan. As the design development is ongoing, the Interim Master Plan incorporates alternative options for recreational buildings and facilities, to enable Thames Water to seek feedback on these through non-statutory public consultation in summer 2024. Additional work is therefore required to further address some of the issues that have been explored in this report, because these are dependent on further stakeholder engagement. There are also some aspects that require more detailed technical consideration and design development, and this will be undertaken alongside addressing feedback from non-statutory public consultation and wider stakeholder engagement. The key issues noted, which require further engagement and consideration, are set out below in Sections 7.2 to 7.4.

### 7.2 Next steps for engagement on the Master Plan

- 7.2.1 The proposed reservoir can provide significant additional value beyond a secure water supply, by enhancing the environment; providing green spaces for leisure and opportunities for recreation; and boosting the local economy by supporting local businesses and offering apprenticeships and jobs for local people.
- 7.2.2 Through February and March 2024, the project team have engaged with a range of stakeholders and representatives of the local communities to listen to their views on the potential opportunities and constraints and take this feedback

into account at this early and formative stage of the Master Plan development. There have been two components to this stage of engagement:

- A community survey, with over 1,000 participants who are representative of local residents<sup>27</sup> and the population of London and the wider South East of England<sup>28</sup>, to understand their preferences on aspects of the design, and what additional activities and features they would value and use as part of the proposed reservoir.
- Workshops with a range of stakeholder organisations<sup>29-32</sup> with an interest in the environment and land and water based recreation, and Parish Councils in the locality of the site to discuss a range of topics including the proposed zones of the site; new habitat creation and connectivity for nature; new footpaths, cycle paths and bridleways; accessibility of the site; types of spaces for art, culture and the community; water-based sport and recreation; and location and type of facilities for schools and visitors.

7.2.3 The community survey indicated that natural trails and access to green spaces were the potential recreational facilities that were most appealing, with wildlife/bird watching, walking and running trails for shorter distances (1-5km) and café/restaurant facilities also indicated as important. There was also interest in a wider range of potential facilities.

7.2.4 A high-level summary of the feedback from the community survey and stakeholder workshops on the Master Plan design development, is set out in Table 7.1. As these workshops were aimed at identifying initial issues for further engagement, the feedback will be taken on board as part of the next iteration of the Master Plan design development, once the project team have had the opportunity to engage and explore the feedback further.

Table 7.1: Summary of feedback on the Master Plan design development received as part of the community survey and workshops in February and March 2024

Geographic Relevance of Comment	Summary of Feedback
General – applicable to	<p>Community survey:</p> <ul style="list-style-type: none"><li>• All the activities and facilities tested were appealing, however some were more favoured than others.</li></ul>

<sup>27</sup> Local residents were included based on a 20km radius from the project, based on data from the Open Geography Portal by the Office for National Statistics.

<sup>28</sup> Office for National Statistics 2021 Census data was used to ensure survey participants were representative of the South East of England.



Geographic Relevance of Comment	Summary of Feedback
Master Plan as a whole	<ul style="list-style-type: none"> <li>• Nature trails and access to green spaces were indicated as the most popular facilities by the survey respondents.</li> <li>• Wildlife/bird watching, short walking and running trails (1-5km) and a café/restaurant were also selected to be amongst the most popular facilities.</li> <li>• Other leisure and recreational facilities such as canoeing, biking trails and fishing were also supported by respondents. but these were indicated as less important.</li> </ul>
	<p>Environment workshop<sup>29</sup>:</p> <ul style="list-style-type: none"> <li>• The project, and specifically the creation of wetlands, provides a fantastic opportunity for biodiversity.</li> <li>• There was a call to be visionary and ambitious, maximising the opportunities for the environment and biodiversity, in the design and delivery.</li> <li>• Emphasis on need to balance environmental ambitions and protection of wildlife with public access and recreation.</li> <li>• Suggestion that strict adherence to BNG requirements could create mediocre habitat. Therefore, the focus should be on achieving the best possible environmental outcome.</li> <li>• Encouragement for a variety of habitat, with careful consideration of the species that this would attract.</li> <li>• Consider woodland creation both within the indicative location for SESRO and beyond.</li> <li>• Support for good quality replacement hedgerows, as wide as possible (&gt; 2m).</li> <li>• Emphasis on need to develop a positive management regime.</li> <li>• Support for a centre for environmental education.</li> </ul>

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<sup>29</sup> The environment workshop was attended by representatives from the Environment Agency, Berks, Bucks and Oxon Wildlife Trust, Freshwater Habitats Trust, Woodland Trust, Oxfordshire County Council, Angling Trust and Letcombe Brook Project.

Geographic Relevance of Comment	Summary of Feedback
	<p>Culture, leisure and recreation workshop<sup>30</sup>:</p> <ul style="list-style-type: none"> <li>• Suggestion that current PRoW network is disjointed and that there is the opportunity to develop a well-designed network.</li> <li>• Consideration to be given to both commuters and recreational cycle routes, to link with existing cycle network and local settlements.</li> <li>• Encouragement to incorporate adequate provision for bridleways.</li> <li>• Considerations to be given to provision of small satellite car parks.</li> <li>• Ideas for leisure across the site included nature trails, benches, picnic spots, play areas and toilets.</li> <li>• Suggestion to record and preserve local heritage and reflect this in the design.</li> <li>• Emphasis on engaging and involving the community to engender local ownership.</li> <li>• Encouragement for educational programme and facility as part of SESRO.</li> <li>• Support for the restoration of the Wilts &amp; Berks Canal.</li> <li>• Encouragement for the participation of younger people, including incorporating facilities for camping, gatherings, Girlguiding, Duke of Edinburgh etc.</li> <li>• Emphasis on ensuring budget for maintenance and not just for construction.</li> <li>• Preference for third party management of facilities.</li> </ul> <p>Community workshop<sup>31</sup>:</p>

<sup>30</sup> The culture, leisure and recreation workshop was attended by representatives from the Oxfordshire Archaeological and Historical Society, Steventon History Society, Sustrans, Vale of White Horse District Council, a local equestrian centre, British Horse Society, Girlguiding Oxfordshire, Wilts and Berks Canal Trust and Oxfordshire County Council.

<sup>31</sup> The community workshop was attended by representatives from Marcham Parish Council, Steventon Parish Council, Harwell Parish Council, West Hanney Parish Council and East Hendred Parish Council.

Geographic Relevance of Comment	Summary of Feedback
	<ul style="list-style-type: none"> <li>• Concern raised about local flood risk. Keen for a multi-agency approach to consider the risk and identify opportunities to achieve an improvement as part of the project.</li> <li>• Concern about nuisance during the construction of the reservoir and inadequacies and congestion of the current local road network were highlighted.</li> <li>• Recognition of the wider benefits including access to green space.</li> </ul>
Zone 3	<p>Water-based recreation workshop<sup>32</sup>:</p> <p>Opportunity for a range of uses of the recreational lakes were suggested, including:</p> <ul style="list-style-type: none"> <li>• Nature and wildlife.</li> <li>• Fishing for families and young anglers.</li> <li>• Building water confidence.</li> <li>• Open water swimming.</li> <li>• Leisure, such as a beach and barbeque area.</li> </ul>
Zone 5	<p>Community workshop<sup>31</sup>:</p> <ul style="list-style-type: none"> <li>• Opportunities for a new railway station.</li> </ul>
Zone 6	<p>Environment workshop<sup>29</sup>:</p> <ul style="list-style-type: none"> <li>• Support for making the embankment slopes look naturalistic, to blend into the surrounding landscape.</li> </ul>
	<p>Water-based recreation workshop<sup>32</sup>:</p> <p>Opportunity for a range of uses of the reservoir were suggested, including:</p>

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<sup>32</sup> The water-based recreation workshop was attended by representatives from the Angling Trust, Royal Yachting Association, Oxford Sailing Club, British Canoeing, Royal National Lifeboat Institution, rowing representative and Oxford Sea Cadets.

Geographic Relevance of Comment	Summary of Feedback
	<ul style="list-style-type: none"> <li>• Support from attendees for sailing, canoeing, angling, rowing and sea cadets.</li> <li>• Keen for a multi-use single 'hub' for visitors and some water sports clubs.</li> <li>• Keen on access for all, including individuals, "pay and play" and club activities.</li> <li>• Vision for spectrum of use, from daytime use through to events and regattas.</li> <li>• Safe and easy access was indicated as paramount. Suggestion of designing a 'natural harbour' on the east-side.</li> <li>• Consider spatial and temporal zoning of activities, with flexibility to adapt to future needs.</li> <li>• Need to give thought to the design of ancillary facilities, for example sufficient car parking; storage; trolleys; and local, affordable accommodation if there are to be events.</li> </ul>

Source: *Thames Water internal.*

7.2.5 In summer 2024, Thames Water will undertake a non-statutory public consultation to share the Interim Master Plan, as well as other elements of the project, to ensure everyone has the opportunity to participate and feed in their views at a formative stage of the project design.

7.2.6 Thames Water also intends to continue engagement with local stakeholder organisations and local communities to ensure effective collaboration on the design of the reservoir and to realise the environmental, social and economic opportunities.

### 7.3 Further key actions for Master Plan design development

7.3.1 Further key actions that have been identified throughout this report, and which will be considered through the continued Master Plan design development process, are set out in Table 7.2. In addition, other design development is likely to be required as a result of feedback from the consultation and/or from ongoing engineering design development.

Table 7.2: Summary of further key actions for Master Plan design development

Geographic Relevance	Further design development
Applicable to Master Plan as a whole	Construction phasing programme – As more detail regarding the construction phasing is developed, the phasing of proposed landscape and environmental mitigation should be considered with a view to identifying opportunities for early implementation.
	Utilities – As the project team engages with utility providers and receives updated utility searches, the Master Plan will need to be refined to respond to possible changes to existing utilities and proposed utility diversions.
	Temporary and permanent environmental bunding design - The nature of the environmental bunding, whether it is proposed for construction only or as a permanent feature, should be kept under review in conjunction with the EIA and as further detail around the construction phasing is developed.
	GCN habitat ponds - Further work is required to confirm the number of ponds and wet ditches to be impacted and if there would be additional impacts on ponds/ditches to be retained, such as changes to groundwater, which would necessitate the need for a larger number of replacement ponds. Pond locations should continue to be reviewed in conjunction with the development of the construction phasing programme.
	Watercourse diversions - Refinement of the eastern and western watercourse diversions is needed to make the alignment more natural with reference to reaches observed sporadically on site. Both western and eastern watercourse diversions will need updating. Appropriate sizing of these diversions will also need to be developed to ensure that the corridors are wide enough to accommodate flood flows whilst providing biodiversity benefits. A project-wide watercourse mitigation and compensation plan will be developed.

Geographic Relevance	Further design development
	Solar array or other on-site renewable generation opportunities (beyond the hydropower turbines) - further review of renewable energy feasibility on site is required.
	Architectural approach - The architectural approach and landscape integration of any buildings and car parking will need to be explored further as part of the work in 2024, in conjunction with further stakeholder engagement.
	BNG – The terrestrial and aquatic BNG calculations will need to be updated to reflect more detailed information once this is available following further survey and assessment work, to respond to any design changes that are introduced as the Master Plan is updated and as regulatory requirements are published. The Master Plan will also need to take consideration of the Local Nature Recovery Strategy, once developed, to ensure that the most appropriate habitats are created in the most appropriate locations. The anticipated BNG requirements will then need to be checked to ensure BNG can be achieved for the scheme. The design will also need to be refined to address any issues arising as a result of the BNG calculations based on the Interim Master Plan options. Requirements for additional off-site mitigation will be identified if necessary.
	Ancient/veteran tree compensation strategy – Development of a compensation strategy for the unavoidable removal of any ancient/veteran trees, in line with the good practice guidance on ancient and veteran trees.
	PRoW links – The PRoW links on the Master Plan are indicative only and will require further development as the design is refined, including to align with the South & Vale Green Infrastructure



Geographic Relevance	Further design development
	<p>Strategy<sup>33</sup>. The proposed PRow and permissive path links indicated on the Interim Master Plan are limited to the indicative location for SESRO and any potential changes outside of this would require further work to identify routes and determine what aspects would be included within the SESRO DCO application.</p> <p>Seek to 'further the purpose' of the North Wessex Downs National Landscape – Further consideration of how to align with section 85 of the Countryside and Rights of Way Act 2000, as amended by section 245 of the Levelling-up and Regeneration Act (2023), as the Act has recently been introduced. Further guidance and engagement with the SESRO Landscape and Visual TLG on how to comply with this is required in the absence of any existing precedents.</p>
Zone 3	Environmental bunding design along the A34 - Refinement of the environmental bunding design along the A34 is required to optimise the height and extent to ensure that there are no conflicts with utilities to be retained or proposed, and to confirm that any significant impact on highway drainage associated with the A34 is prevented.
Zone 5	Reinstatement of rail siding and material handling area – The proposed reinstatement/habitat creation on land for the temporary rail siding and material handling area will need to be developed to reflect the preferred location determined through option appraisal in March 2024, as this has not yet been incorporated into the Interim Master Plan.
Zone 6	Floating islands - further specialist advice is being sought from a floating island / floating ecosystems provider, to help ascertain whether the floating islands could potentially withstand the higher

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<sup>33</sup> Chris Blandford Associated on behalf of South Oxfordshire & Vale of White Horse District Councils (2017). South & Vale Green Infrastructure Strategy Online. Available at: [https://data.whitehorsedc.gov.uk/java/support/dynamic\\_serve.jsp?ID=1019020450&CODE=6FC84D5697E564DA1F77A5D61D3F14CC](https://data.whitehorsedc.gov.uk/java/support/dynamic_serve.jsp?ID=1019020450&CODE=6FC84D5697E564DA1F77A5D61D3F14CC). Accessed May 2024.

Geographic Relevance	Further design development
	wave actions anticipated to the north and to further develop the proposals for the floating islands, including safety aspects.
	Reservoir towers - Further work is required to determine if the number of secondary reservoir towers can be reduced from two to one, and to develop the architectural approach to the towers.
	Shape of the reservoir - Opportunities to create variations in the edge of the reservoir water body will need to be explored as part of the work in 2024, following comments from Natural England.
	Riprap - Further work is required to consider the practicality and visual effect associated with specification of a variety of coloured stones for the riprap.
	Toe drain - Update of the Master Plan is required to ensure that sufficient space is allocated for the width of the toe drain (to up to 5.5m at the top of the channel, 1.2m watercourse channel within this). Further work is also required to determine an appropriate connection of the toe drain into the Landmead Ditch and eastern watercourse diversion.
Zone 7	Intake/outfall structure - Further work is required to refine the landscape design associated with the intake/outfall structures, in conjunction with their architectural development.

Source: Thames Water internal.

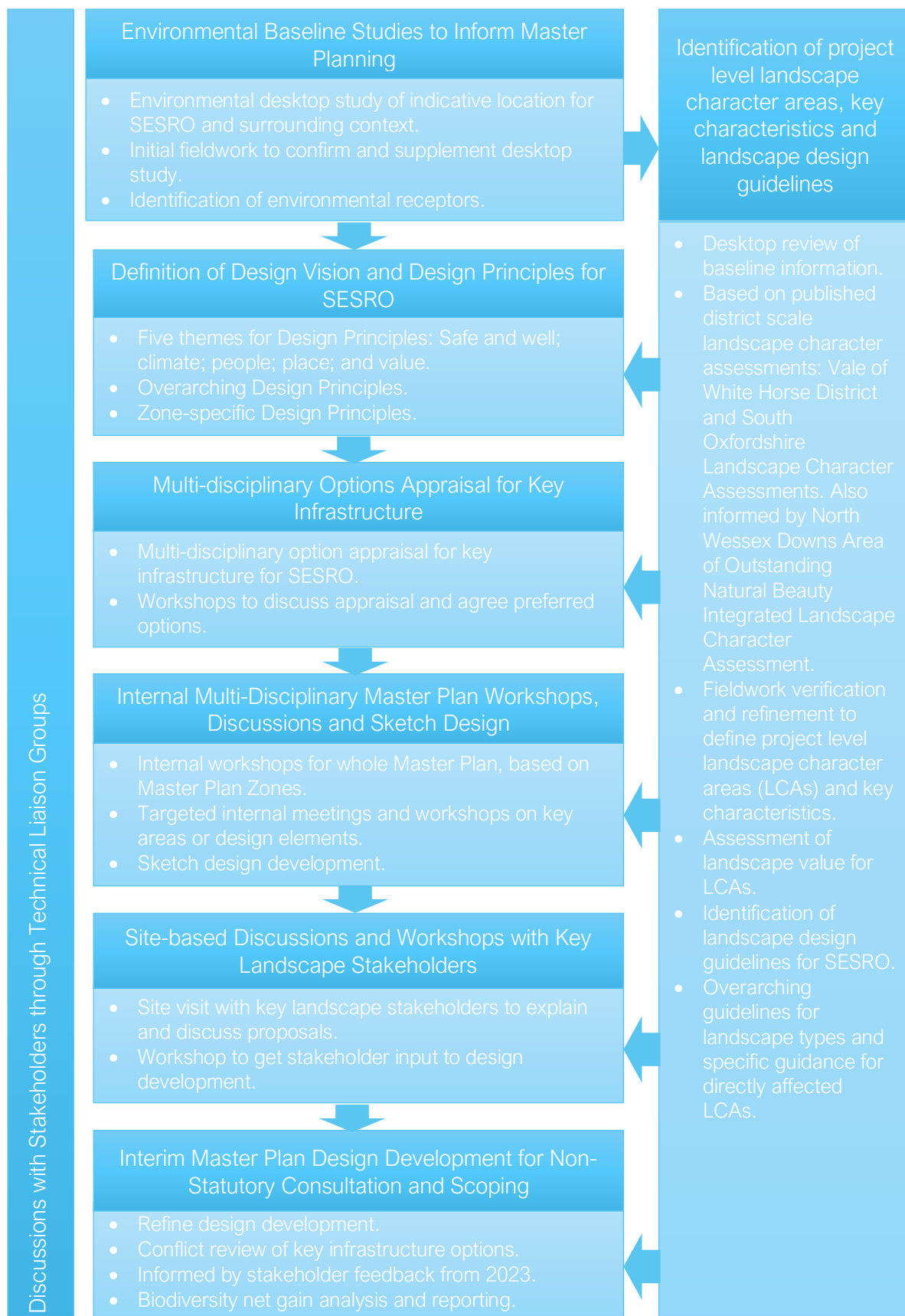
## 7.4 Other actions for further design and consenting stages

- 7.4.1 Section 7.3 identified key points of further Master Plan design development, prior to making a DCO application. It is acknowledged that there will be a wide range of further design and master planning work to be undertaken at subsequent stages for the DCO application, for discharge of future DCO requirements and for processes such as Environmental Permitting or protected species licensing, for example.

## Appendix A Interim Master Plan Design Development Process

- A.1.1 Figure A.1 illustrates the landscape and environment led design development process for the Interim Master Plan for SESRO up to March 2024, leading up to non-statutory consultation and scoping. This appendix sets out some further information regarding the options appraisals internal multi-disciplinary master plan workshops, discussions; and site-based discussions and workshops with stakeholders, including the purpose and key outcomes of the various workshops and discussions that have taken place.

Figure A.1: Interim Master Plan Design Development Process up to March 2024



Source: Thames Water internal.

## A.2 Identification of Project Level Landscape Character Areas

- A.2.1 Project level landscape character areas (LCAs) have been identified to inform the Master Plan design development, as requested by the Landscape and Visual Technical Liaison Group (TLG) on 5 July 2023 (refer to Appendix B). The project level LCAs are based on a refinement of published district scale LCAs, where necessary, using desktop material and field verification. The published district scale LCAs that were reviewed are the Vale of White Horse District<sup>34</sup> and South Oxfordshire Landscape Character Assessments<sup>35</sup> which are of a consistent scale and level of detail across the study area. While it is understood that these published studies are being updated as part of the Joint Local Plan, any emerging draft updates to the studies have not been considered as they have not yet been finalised and could be subject to further changes before they are adopted. The North Wessex Downs Area of Outstanding Natural Beauty Integrated Landscape Character Assessment<sup>36</sup> has also been referred to for any areas that overlap with what is now referred to as the North Wessex Downs National Landscape. The LCAs have been identified within a 1km radius around the indicative location for SESRO at Gate 2, with an extended area to include the scarp of the North Wessex Downs National Landscape approximately 6.5km to the south of the indicative location for SESRO.
- A.2.2 While the published district level landscape character assessments include landscape guidance for landscape character types (LCTs), this has not been written with SESRO in mind. It refers instead to more general land management guidelines and built development as key pressures for change with no mention of a proposed reservoir. Therefore, landscape guidelines relating more specifically to SESRO have been identified for the LCTs and project LCAs. These have been used to inform the development of a set of overarching and zone-specific Design Principles for SESRO which, in turn, has been used to guide the development of the Master Plan (refer to Section 3.40 for further detail).

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<sup>34</sup> Hankinson Duckett Associates (HDA), on behalf of Vale of White Horse District Council (2017). Vale of White Horse District Landscape Character Assessment. Online. Available at: <https://data.whitehorsedc.gov.uk/java/support/Main.jsp?MODULE=FolderView&ID=789122104&CODE=498F5A0A897C751630F233DEB1E72432&NAME=19.+Landscape+Character+Assessment&REF=Local%20Plan%202031%20Part%202:%20Publication%20Version%20Publicity%20Period>. Accessed May 2024.

<sup>35</sup> South Oxfordshire District Council (2017). South Oxfordshire Landscape Character Assessment. Available at: [https://data.southoxon.gov.uk/ccm/support/dynamic\\_serve.jsp?ID=788092192&CODE=4650A3652852911819269B1BB795E501](https://data.southoxon.gov.uk/ccm/support/dynamic_serve.jsp?ID=788092192&CODE=4650A3652852911819269B1BB795E501). Accessed May 2024.

<sup>36</sup> Land Use Consultants (2002). North Wessex Downs Area of Outstanding Natural Beauty Integrated Landscape Character Assessment. Online. Available at: <https://www.northwessexdowns.org.uk/downloadable-resources/>. Accessed May 2024.

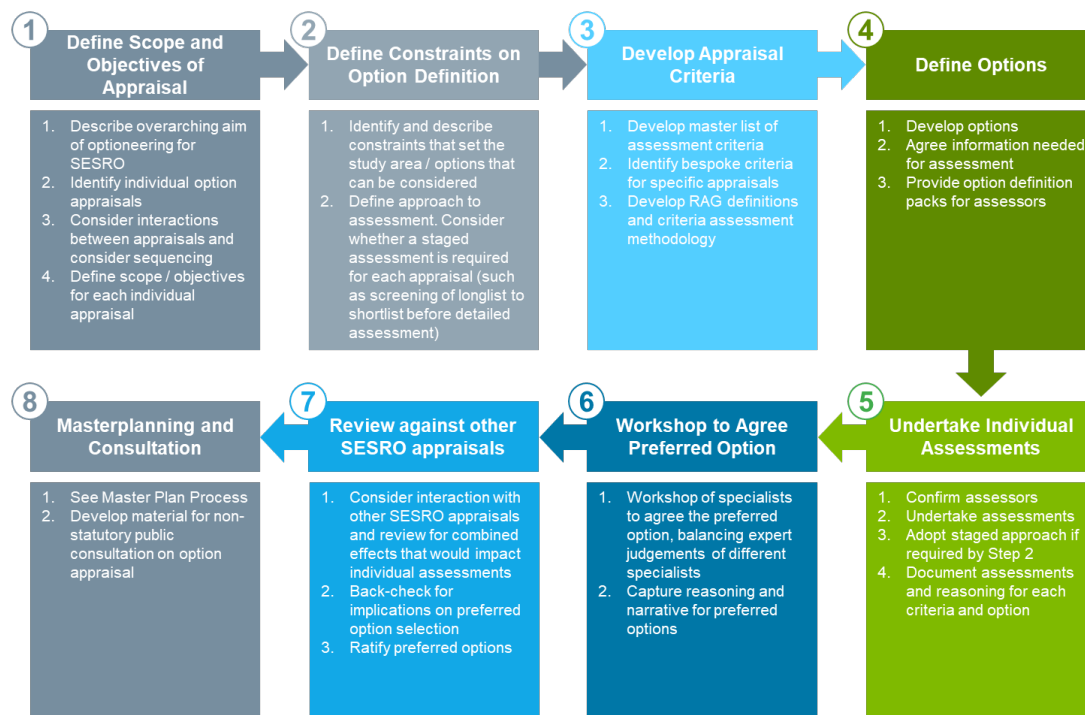
- A.2.3 Key steps in the multi-disciplinary and collaborative design approach for the Master Plan development are set out below.

### A.3 Multi-disciplinary Options Appraisal for Key Infrastructure

- A.3.1 At Gate 2, alternative options for the configuration and layout of essential infrastructure elements of the 150 Mm<sup>3</sup> SESRO project were not appraised in detail. However, it was recognised that different arrangements would potentially have different impacts and benefits to local people, the environment, land, planning, construction and operation.
- A.3.2 It was identified that options appraisal work should be undertaken for SESRO to support development of the overarching design concept, Design Vision, and Master Plan and to analyse the various configurations and choices that can be made in the design of the project. This has been undertaken to achieve a technical consensus of the preferred configuration of the project, within the physical constraints of the site, whilst still delivering the overall outcomes required by the WRMP<sup>8</sup> in terms of the 150 Mm<sup>3</sup> storage volume and timing.
- A.3.3 Four elements of the project were identified for option appraisal at the start of Gate 3. These were recognised as being core infrastructure items needed for SESRO where alternative options were possible. These included:
- The main road access to the reservoir site and a road diversion between East Hanney and Steventon.
  - Location of a temporary rail siding and materials handling area for importing materials during construction.
  - Options for connectivity to the River Thames, covering emergency discharge and intake/outfall arrangements.
  - Options for locating a water treatment works (WTW) for the Thames to Southern Water Transfer (T2ST) within the SESRO site.
- A.3.4 Consideration of the location and function of amenity/recreation buildings and educational facilities have not been subject to an option appraisal and were considered through the Master Plan design development process.
- A.3.5 The approach to option appraisal adopted for SESRO was to use a qualitative multi-criteria analysis that developed a narrative for the performance of each identified option against a set of criteria. These included aspects related to construction and operation (i.e., engineering), cost, carbon, environment, community and planning, property and land acquisition. Criteria assessments were used to support discussions between discipline specialists to identify a preferred option for each study.
- A.3.6 A common approach has been adopted for all option appraisal studies for the SESRO project, and the methodology is summarised in Figure A.2.



Figure A.2: Overview of Appraisal Methodology



Source: *SESRO Option Appraisal Context and Methodology Report (J696-DN-A01A-ZZZZ-RP-ZD-100006)*.

A.3.7 This Master Plan Report addresses steps 7 and 8 of the optioneering methodology (see document (J696-DN-A01A-ZZZZ-RP-ZD-100006)).

A.3.8 For further information refer to option appraisal reports:

- SESRO Option Appraisal Context and Methodology Report (J696-DN-A01A-ZZZZ-RP-ZD-100006)
- Access and Diversion Roads Options Appraisal Report (J696-DN-A01A-ZZZZ-RP-ZD-100009)
- Rail Siding and Materials Handling Area Options Appraisal Report (J696-DN-A01A-ZZZZ-RP-ZD-100008)
- Connectivity to the River Thames Options Appraisal Report (J696-DN-A01A-ZZZZ-RP-ZD-100010)
- Water Treatment Works Options Appraisal Report (J696-DN-A01A-ZZZZ-RP-ZD-100007)

A.3.9 The outcomes and current status of the four options appraisal studies for the access and diversion roads, rail siding and materials handling areas, connectivity to the River Thames and WTW are set out below.

### Access and Diversion Roads Options Appraisal

A.3.10 The preferred option for the SESRO main access road is a route which

commences with a roundabout to connect onto the A415 Marcham Road, opposite the potential access road to potential future residential development at Dalton Barracks. The route runs south close to the A34 for approximately 2.4km and then turns west towards the proposed location of the pumping station. The preferred alignment is almost the same as in the Indicative Master Plan 2022. However, the preferred option for the main access road now joins the existing A415 Marcham Road further to the east. This means that the main access road is less likely to help facilitate a possible future South Marcham Bypass (also known as the Marcham Movement Corridor in the consultation draft Joint Local Plan to 2041, January 2024) which is located further west, close to Marcham, but could form part of the possible future South Abingdon-on-Thames Bypass (also known as the Southern Abingdon Movement Corridor in the consultation draft Local Plan) as the alignment intersects with this corridor. Land safeguarded for both of these possible future strategic transport schemes are identified in the Vale of White Horse District Council Local Plan 2031<sup>37</sup>, while the emerging consultation draft Joint Local Plan (2041)<sup>38</sup> includes and describes these as 'movement corridors', which is understood from discussion with Oxfordshire County Council to reflect potential for transport options other than a road bypass within these corridors. More information on how the preferred option interacts with other external schemes is detailed in the Access and Diversion Roads Options Appraisal Report (J696-DN-A01A-ZZZZ-RP-ZD-100009).

A.3.11 The preferred option for the Steventon to East Hanney road diversion commences in the east from Hanney Road just outside Steventon, it then turns immediately south towards the Great Western Main Line railway for approximately 1km and then turns towards the west where it runs parallel to the railway, south of the reservoir, for approximately 2.8km, when it then crosses the western watercourse diversion and the proposed corridor to reserve space for the potential future route of the Wiltshire and Berkshire Canal. After the crossings, the road heads northwest for approximately 1.2km where it would connect onto the existing A338 with a roundabout, approximately 250m from the edge of the closest property in East Hanney. The preferred road alignment option is the same as that shown in the Indicative Master Plan 2022.

A.3.12 The preferred road options described above have been incorporated into the Interim Master Plan.

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<sup>37</sup> Vale of White Horse District Council (2019). Local Plan 2031 Part 2 Detailed Policies and Additional Sites. Online. Available at: <https://www.whitehorsedc.gov.uk/wp-content/uploads/sites/3/2021/03/VOWHDC-Master-1.pdf>. Accessed May 2024.

<sup>38</sup> South Oxfordshire District Council and Vale of White Horse District Council (2024). Joint Local Plan preferred Options Consultation (Regulation 18 Part 2). Online. Available at: <https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2024/01/Joint-Local-Plan-Preferred-Options-Document.pdf>. Accessed May 2024.

### Rail Siding and Materials Handling Area Options Appraisal

- A.3.13 The option appraisal identifies a preferred option to the south-west of the site that avoids the nearby The Cuttings and Hutchins Copse LWS.
- A.3.14 The rail siding is conceived (for the purpose of SESRO) as a temporary facility to support construction and, therefore, is not shown on the Interim Master Plan. However, this does not preclude further discussion and consideration of the potential for elements of the rail siding and materials handling area to facilitate future development of a possible Wantage and Grove Passenger Rail Station (by other parties). For the next iteration, the Master Plan will need to be updated to incorporate reinstatement of the land associated with the rail sidings, as this has not yet been incorporated.

### Connectivity to the River Thames Option Appraisal

- A.3.15 The preferred option for the intake/outfall Structure is located along the western (right hand bank) of the River Thames, east of a flooded gravel pit and just north of the Wiltshire and Berkshire Canal Trust Inlet. The site would be accessed via the B4107, Stonehill Lane and Peep-O-Day Lane, and utilise a single location for the intake, outfall and associated structures. This location is slightly further north than the option which was included on the Indicative Master Plan 2022, the option also necessitates a short diversion of one of the outfalls from the Abingdon STW.
- 7.4.2 The options assessed for emergency discharge from the reservoir were discharge of all emergency flow through a below ground conveyance tunnel; and another option which included discharge through an above ground channel (ADC) along with discharge through the conveyance tunnel. The tunnel-only option was found to be preferred. The reason for this is that it reduces engineering complexity, reduces land take and generally reduces environmental impacts. As such, the Interim Master Plan has been updated to align with this and therefore omits the ADC that was indicated on the Indicative Master Plan 2022.

### Water Treatment Works Options Appraisal

- A.3.16 Two preferred locations for WTWs have been identified.
- A.3.17 The first is an area north-east of the proposed reservoir embankment and south-east of an area of replacement floodplain storage which is reached via the SESRO Access Road. The option is in close proximity to the proposed pumping station, which means that only a limited length of raw water pipeline would be required. The treated water transfer pipeline would run south along the toe of the embankment to the southern indicative extent of SESRO, where the pipeline would have to cross the Great Western Main Line railway.
- A.3.18 The second preferred location has been identified in an area further from the proposed reservoir, to the northeast, in an area of slightly elevated topography

compared with the surrounding landscape. The WTW would be reached via the SESRO main access road. This would require a junction for access to the WTW further north, when compared to the first option. The raw water and treated water transfer pipework required for the option would be routed similarly to the first option, although it would be slightly longer.

A.3.19 Both areas are shown on the Interim Master Plan.

#### [Review against other SESRO appraisals](#)

A.3.20 As part of the master planning process, it has been confirmed that there are no conflicts between the preferred infrastructure options. As such, no further back-checking of the options has been required and the preferred options have been ratified in line with step 7 of the optioneering methodology (see document (J696-DN-A01A-ZZZZ-RP-ZD-100006) and incorporated into the Interim Master Plan for non-statutory public consultation in summer 2024.

### [A.4 Internal Multi-disciplinary Master Plan Workshops, Discussions and Sketch Design](#)

#### [Internal multi-disciplinary workshops for the whole of the Master Plan](#)

- A.4.1 An initial Master Plan workshop was held in November 2023 to discuss the Master Plan Zones illustrated on Figure 4.1. The purpose of the workshop was to identify and discuss key elements requiring design development for people and the environment. This included discussion around how to improve landscape integration and respond to the emerging guidance for the project level landscape character areas, as well as the developing Design Vision and overarching and zone-specific project Design Principles.
- A.4.2 At this stage, some of the initial options appraisal workshops had been undertaken and so, for the main access road and Steventon to East Hanney road diversion, there were preferred options identified and ready for integrating into the Master Plan for SESRO. The option appraisals for other essential infrastructure items had not yet been concluded.
- A.4.3 Other input which informed the discussion included:
- Landscape and environmental constraints.
  - Guidance that was emerging for the project level landscape character areas.

- Insights from the Gate 2 Conservation, Access and Recreation (CAR) Assessment<sup>39</sup>, as well as CAR assessments from other reservoirs.
- The developing Design Vision and Design Principles.
- The Thames Water SESRO Customer Commitments (as published in the Autumn 2023 SESRO Summary Brochure<sup>40</sup>).
- Feedback from the SESRO Landscape and Visual TLG in summer 2023.
- Potential architectural concepts for the operational and recreational buildings and facilities on site.

A.4.4 During the workshop the technical specialists in the multi-disciplinary team reviewed each of the Master Plan Zones, identifying key elements that would require further design development to improve the landscape integration of the project, and respond to the developing Design Vision, Design Principles and feedback from the SESRO Landscape and Visual TLG. The workshop resulted in a number of follow up actions for the technical specialists to progress the Master Plan design development, in order to reflect the focus of each Master Plan Zone and relevant key landscape characteristics.

#### Targeted internal multi-disciplinary meetings and workshops on key areas or elements of the design

A.4.5 A number of internal multi-disciplinary meetings were held to follow up on the actions arising from the initial Master Plan workshop in November 2023 and sketch design development was undertaken. This section describes the outcomes of the key targeted follow-up workshops held to develop the arrangement of operational and recreational facilities.

#### Arrangement of operational and recreational facilities

A.4.6 A workshop was held to develop the arrangement of operational and recreational facilities, as it was established during the workshop for the whole of the Master Plan that Zones 2, 3 and 6 contained a lot of assets in a relatively focussed area. Therefore, this would require a specific discussion to develop this as part of the Interim Master Plan.

A.4.7 The purpose of the workshop was to focus on the location and relationship between operational and recreational facilities, including if and how they would

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<sup>39</sup> Thames Water and Affinity Water (2022). South East Strategic Reservoir Option (SESRO). Technical Supporting Document B3. Conservation, Access and Recreation Strategy. Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/B-3---SESRO-CAR.pdf>. Accessed May 2024.

<sup>40</sup> Thames Water (2023). South East Strategic Reservoir Option (SESRO) – a new reservoir for the south east. Online. Available at: <https://thames-wrmp.co.uk/sesro/>. Accessed May 2024.

be segregated. The architectural approach for any buildings was also discussed, considering whether their design should celebrate the buildings or aim to hide them from view.

- A.4.8 The workshop considered several potential layouts, which were refined to a short-list of option layouts based upon technical specialists in the multi-disciplinary team considering the relevant constraints, potential high-level landscape and environmental effects based on professional judgment and project requirements for each of the relevant zones, in order to identify how to best integrate the arrangement of operational and recreational facilities within the Interim Master Plan.
- A.4.9 All of the short-listed options retained the SESRO pumping station in a similar location to that proposed in the Indicative Master Plan 2022 near the north-east corner of the reservoir embankment. This was agreed to be the most efficient location for the pumping station, as it aligned to the lowest point of the borrow pit within the reservoir and meant the tunnel to the intake/outfall structure was as short as possible. The orientation of the dip of the bedrock clay strata also constrains moving the pumping station, particularly to the north-west. This is to enable the entire structure and connecting tunnels to be constructed within the Kimmeridge Clay and not interface with the underlying Corallian aquifer.
- A.4.10 The options included consideration of possible WTW locations. The workshop established the need for further options appraisal and this was therefore further developed as part of the Water Treatment Works Options Appraisal, as referred to in Section A.3.
- A.4.11 A follow up workshop was also arranged separately to the Water Treatment Works Options Appraisal where each of the short-listed options were further reviewed by the technical specialists in the multi-disciplinary team and a preferred arrangement of potential operational and recreational facilities was agreed for the purposes of the Interim Master Plan, incorporating all of the alternatives identified for potential recreational facilities.

## A.5 Site-based discussions and workshop with stakeholders

- A.5.1 A site visit and Master Plan workshop with representatives invited from Natural England, the North Wessex Downs National Landscape, Oxfordshire County Council, South Oxfordshire and Vale of White Horse District Council and the Environment Agency, were held on 22 November 2023 and 11 December 2023 respectively. This was in response to feedback provided by the SESRO Landscape and Visual TLG during the summer of 2023.
- A.5.2 The purpose of the site visit was to provide the stakeholders with a better understanding of the site and its context, as well as providing the opportunity to discuss the proposals on site with key members of the project team that were working on the Master Plan design development. The indicative location for SESRO was the main focus of the site visit, but the visit also incorporated a



short walk along The Ridgeway National Trail near Scutchamer Knob in the North Wessex Downs National Landscape, to allow discussion of the more distant views looking towards the site.

A.5.3 The informal site discussions helped to inform more detailed discussion regarding the Master Plan design development during the follow-up Stakeholder Master Plan workshop on 11 December 2023. The purpose of the workshop was to get stakeholder input to the development of the SESRO Master Plan. The design rationale for some key design elements, such as the reservoir shape and embankment were explained by the project team. During the workshop, key topics relating to different zones of the Master Plan were discussed and comments recorded. Following the workshop, the stakeholders were also invited to provide further feedback in writing and some further comments were received from Natural England.

A.5.4 The discussions during the workshop and follow up feedback generally confirmed that the Master Plan design development is moving in the right direction whilst also flagging issues for further consideration, such as:

- Optimising the western side of the reservoir and adjacent wetlands for ecological purposes.
- Avoiding proposals for education centre or other structures within wetlands in Zone 1.
- Designing desire lines to take people through less sensitive habitats and make it harder to get to good habitat, and restricting access in places to reduce conflicts between dogs and breeding birds.
- Further development of lagoons along the western side of the reservoir.
- Exploring use of floating islands along the north-side of the reservoir.
- Exploring planting on the embankment to help break up views.
- Referencing the wider landscape pattern and boundaries to assist with transition to the surrounding landscape.
- Developing design for specific species, as more baseline information becomes available through surveys.
- Considering if different colour stones and sizes could be used to make the riprap look less uniform and reduce visual effects.
- Giving further consideration to the design (height and appearance) of reservoir towers.
- Suggestion to try to make the reservoir edges and embankments less regular in shape, particularly along the north-side.
- Considering if there are ways to reduce the gradients of the southern reservoir embankment.
- To seek to 'further the purpose' of the North Wessex Downs National Landscape in line with section 85 of the Countryside and Rights of Way Act

2000, as amended by section 245 of the Levelling-up and Regeneration Act 2023, using earthworks contouring, planting and green roofs to soften views of associated buildings and infrastructure, use of National Landscape colour guidance<sup>41</sup>, reducing the extent of roads and car parking on the embankment crest and avoiding large areas of hard standing.

- Preference for buildings at the base of the embankment or measures to reduce impact, e.g. use of green roofs.
- Considering visual separation of recreational and operational facilities, including WTWs.
- Consolidating recreational facilities on the embankment into one area.
- Keeping residential edges quiet.

A.5.5 The feedback has been considered in the ongoing design development and changes have been incorporated in the Interim Master Plan in response to the feedback. However, some suggestions received will require more detailed consideration, as listed in Table 7.2 of this report and will be fully addressed through the continued Master Plan design development process.

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<sup>41</sup> Waygood Colour for North Wessex Downs Area of Outstanding Natural Beauty (2020). Guidance on the selection and use of colour in development. Online. Available at: [https://www.northwessexdowns.org.uk/wp-content/uploads/2021/11/WD\\_guidance\\_screen.pdf](https://www.northwessexdowns.org.uk/wp-content/uploads/2021/11/WD_guidance_screen.pdf). Accessed May 2024.

## Appendix B Feedback on Reservoir Design and Key Issues from Natural England on behalf of SESRO Landscape and Visual Technical Liaison Group

- B.1.1 The content in this appendix was issued to Thames Water on 28 June 2023, ahead of the Landscape and Visual Technical Liaison Group meeting on 5 July 2023.

**Natural England - Note to SESRO applicants re reservoir design and key issues to be addressed (for 5<sup>th</sup> July 2023 meeting)**

The following issues and concerns from Natural England are directly linked to effects on the North Wessex Downs AONB. They are however, of likely to relevance to the local authorities seeking to conserve or enhance the landscape character of the proposed development site and its wider area in relation to both its effects on the setting of the designated landscape and the non-designated landscape in which the site itself lies. There are significant lessons to be learnt in relation to the approach to reservoir siting and construction from the period of reservoir building between the 1950s and the 1970s, and many of these lessons can be applied to this scheme and are drawn out in the points set out below.

The following landscape considerations also provide for a reservoir which can deliver significant gains for biodiversity and opportunities for people to have contact with nature.

- The highest quality design and other mitigation with regard to the AONB is justified by the national status of the AONB and the need to uphold its statutory purpose. The applicant should note that Natural England, as the designating authority for the AONB, will have upholding that statutory purpose as its principal objective throughout the evolution and final examination of this scheme.
- The design and delivery of the reservoir should be landscape led. This fundamental principle was applied in the historic schemes mentioned above, and means that:
  - Collaboration between the scheme's engineers, landscape architects/planners and architects is key, and was a major factor in successfully embedding reservoir schemes into their landscapes in the 50's to 70's. This should be the model for SESRO, and means that landscape experts and the scheme's engineers must work very closely on design and delivery. Where conditions absolutely require an approach which prevents or severely limits optimum design outcomes then this needs to be fully explained and justified in emerging plans and in the eventual Environmental Statement. We would welcome a clear commitment from the applicant to this effect.
  - A full and detailed landscape character assessment of the site and its environs is required in order to identify all the existing high value landscape characteristics of the receiving landscape to deliver a high-quality new landscape, which enhances the wider landscape character, includes references to that which has been erased within the site and aims to minimise potentially harmful landscape and visual effects.
  - The reservoir will obviously completely alter the character of the receiving landscape and place a very large body of water on clear view from and to the AONB. We are looking for a very considered approach to the design of the reservoir to create something, which whilst still new in the view and changing it fundamentally, is visually appealing and with characteristics which are as naturalistic as possible. A regular shaped and otherwise visually highly engineered and artificial reservoir must be avoided. The two most basic considerations are:
    - The shape of the reservoir and how a 'natural' and organic shape can be produced.

- How the height, gradient and profile of the retaining bunds can be reduced and softened. This needs to be combined with shallow water around the 'shore' rather than an immediate descent into deep water, to allow reed beds to be established and areas where light can reach the reservoir floor to support a rich aquatic ecosystem. This will contribute to a reservoir which is visually attractive as well as biologically rich. The consideration of the edges of the reservoir, in particular the draw down zone and the exposed sides of the reservoir in views from the AONB must be taken into account as part of the design.
- Careful design of the immediate surrounding landscape is vitally important, both in terms of how this ties the reservoir both visually and functionally into its landscape setting, and with planting and other screening to filter and soften views from the AONB.
- Need to be very clear what can actually be provided taking into consideration the technical side/engineering to ensure the landscaping and biodiversity elements can be delivered. Maintenance and management of the surrounding landscape needs to be considered as part of this.
- The design and siting of ancillary structures and infrastructure such as pumphouses will need to be given careful consideration so that they don't detract from the overall design and delivery of new high-quality landscape, notably in views from the AONB. Historic precedent should be referred to in this regard.
- The above should also apply to any non-essential but deemed desirable / necessary infrastructure such as car parking for visitors. Again, historic approaches are useful as guidance.
- The reservoir and its surrounding landscape should provide a multifunctional resource delivering benefits for the landscape, nature and for people. Public enjoyment of this new resource should focus on contact with nature and not high energy water sports such as yachting or water skiing. These would be visually intrusive and noisy, and require an entire infrastructure of buildings and facilities to access the water.
- We are open to the idea of a floating solar array for the deeper main body of the reservoir because this could visually mimic the water surface when viewed from the AONB.

## Appendix C Access and Security Requirements

C.1.1 The design for SESRO must comply with the requirements of the Reservoirs Act 1975. The landscape and environmental design will need to allow for sufficient reservoir inspection, surveillance and monitoring to be undertaken to ensure the proposed reservoir is maintained and operated safely throughout its operational life. Key activities will likely include:

- Monitoring of movement of the embankment crest and other points.
- Monitoring of geotechnical instrumentation installed within the dam and its foundation.
- Monitoring of drainage flows around the outer embankment perimeter.
- General visual monitoring of the external surfaces of movement and change.

C.1.2 There are also a number of other access and security issues that have to be considered in the master planning, to ensure the secure operation of the reservoir and associated infrastructure. The high-level approach to this has been considered in the context of the draft Design Vision and Design Principles for SESRO, and is set out below.

### C.2 Access Pedestrian

C.2.1 Perimeter fencing is usually installed around reservoir sites. This can be used, for example, in restricting night-time access, such as at the Thames Water operated Farmoor Reservoir in Oxfordshire, where there is no night-time public access to the reservoir crest or car park. Such fencing, however, is not considered appropriate at SESRO due to the numerous PRoW crossing the site and Thames Water's commitment to '*create extensive opportunities for new public spaces, providing access for all to the reservoir and its surroundings, including new recreational and educational facilities*', as set out in the SESRO summary brochure in autumn 2023<sup>42</sup>. Therefore, with the exception of critical assets which would need to be securely fenced, the site would generally be managed as a publicly accessible area, with no requirement to fence it off from the wider landscape.

#### Vehicular

C.2.2 Vehicular access to SESRO would be required for operational staff, recreational visitors and deliveries. The Interim Master Plan concept assumes that

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<sup>42</sup> Thames Water (2023). A new reservoir for the South East. Online. Available at: <https://camargue-thames-water-wrmp.s3.eu-west-2.amazonaws.com/sro/SESRO+Brochure+FINAL.pdf>. Accessed May 2024.

operational access would be required on a 24/7 basis, whereas recreation access would be primarily in daylight hours. The main access road would be used for both purposes.

- C.2.3 Vehicular access would be provided to the visitor centre car park during daylight hours and the car park would be closed to the public at night (most likely through use of an automated barrier).
- C.2.4 Operational staff would have vehicular access to all areas of the site with small amounts of parking provided as appropriate for critical operational assets such as the pumping station and water treatment facilities. Additional security barriers would be provided to control vehicular and personnel access to all operational areas.
- C.2.5 For access to the embankment crest via the primary access route, vehicular access at the foot of the embankment would be through a controlled barrier. The barrier would limit access to users of the water sports centre, along with disabled visitors and for staff and deliveries to the café and water sports centre.
- C.2.6 In case the primary access route to the crest in the north-east corner of the site would be inaccessible, there is a secondary access route proposed to the embankment crest further south, to the west of Steventon. This route would mainly serve as a footpath for visitors, but would also provide access for vehicles in an emergency, which would be controlled using lockable bollards or gates.
- C.2.7 There are two ways proposed for reaching the secondary access route to the embankment crest. From the east, access would be via Steventon and the short section of road which is proposed to lead to a small car park. From the north, as illustrated on the Interim Master Plan, there would be an alternative operational access road along the alignment of the eastern reservoir embankment toe. This would connect the main SESRO site access road with the secondary access route to the embankment crest described above. There would be no access for public vehicles to this route as both ends would be controlled using lockable bollards or gates.
- C.2.8 The perimeter toe drain at the base of the reservoir embankment would be shaped to prevent unauthorised access onto the dam by vehicles, and any crossings over the ditch would be gated. Hedgerow planting would also be provided alongside the toe drain. It is, therefore, not envisaged that an additional perimeter bund or fence would be required as a separate vehicular deterrent to the toe drain.
- C.2.9 As illustrated on the Interim Master Plan, an access track is proposed adjacent to the perimeter toe drain around the entire reservoir embankment, except at the north-east corner where an access road is proposed. This track would form part of the proposed network of PRow and permissive paths but would also provide access for operational vehicles for inspecting and maintaining the toe drain.



C.2.10 Temporary vehicular barriers could be provided if a specific threat is identified.

### C.3 Security

C.3.1 A Security Risk Assessment was prepared at Gate 2 and this will be reviewed and updated as the project progresses.

C.3.2 Critical assets, including the pumping station, river intake and outfall structure and the WTWs would be secured with 2.4m high fencing, in accordance with Thames Water Security Standards. Critical assets would be grouped together, where practicable, to reduce the amount of fencing required.

C.3.3 Security features for recreational facilities, such as the visitor centre and water sports centre would be separated out from security for critical assets. Fencing up to 2.4m high would be installed, as required, for example to secure boat storage areas.

### C.4 Lighting

C.4.1 In line with the overarching Design Principles, the introduction of lighting into the landscape would be reduced as far as reasonably practicable in order to limit the effect of light spill on the night skies locally and to conserve the dark skies of the North Wessex Downs National Landscape. Consideration would also be given to the effect of lighting on wildlife and biodiversity.

C.4.2 In line with this, security lighting requirements would be kept to a minimum. However, infra-red lighting would be required for CCTV at the WTW and, potentially, the pumping station.

C.4.3 Elsewhere, lighting would be provided around the reservoir where required for security, health and safety purposes. This may include, but not be limited to, security lighting for some recreational buildings or storage facilities.

C.4.4 It is assumed that the main access road and Steventon to East Hanney road diversion would not generally be lit, except for lighting at junctions to comply with highway standards and subject to agreement with the highway authority. Consideration will also need to be given to possible requirements for lighting for the associated footways and/or cycle routes.

## Appendix D Interim Landscape and Environmental Master Plan with Below Ground Emergency Discharge Tunnel



Legend

Existing:

- Public rights of way
- Woodland in the wider landscape
- Woodland to be retained as far as practicable
- Scrub to be retained as far as practicable
- Hedgerow to be retained as far as practicable
- Hedgerow with trees to be retained as far as practicable
- Tree belt to be retained as far as practicable
- Watercourse to be retained
- Water body to be retained

Proposed:

- Reservoir water extent
- Indicative replacement floodplain storage
- Inner toe of reservoir embankment and borrow pit contours
- Indicative embankment and bund contours
- Corridor for potential future canal diversion
- Indicative vantage point with seating area for views towards North Wessex Downs National Landscape and/or limestone ridge
- Public rights of way or permissive paths
- Car park with hardstanding
- Car park with reinforced grass
- Visitor centre
- Cafe
- Education centre
- Water sports centre
- Recreational facility
- Operational facility

Proposed:

- Watercourse diversion
- Watercourse realignment
- Wetland ditch
- Embankment toe-drain/perimeter ditch
- Wetland habitat mosaic with reeds, species rich wet grassland and floodplain marsh
- Floating island
- Wildlife ponds, scrapes and pools
- Great crested newt habitat pond
- Recreational lakes
- Marginal habitat
- Species-rich native hedgerow
- Species-rich native hedgerow with trees
- Existing hedgerow to be retained as far as practicable and enhanced
- Existing hedgerow with trees to be retained as far as practicable and enhanced
- Existing tree belt to be retained as far as practicable and enhanced
- Pasture for sheep grazing
- Species-rich neutral grassland
- Scrub
- Intermittent trees and shrubs
- Woodland and copse
- Wet woodland
- Land to be reinstated and returned to agriculture
- Land to be reinstated to existing use

**Disclaimer**  
The indicative proposals illustrated on this drawing, including potential locations of operational and recreational facilities, is subject to consultation, stakeholder engagement and further design development.

Green infrastructure proposals along the northern fringe to align with the Ock Valley Blue Corridor ambitions, set out in the South & Vale Green Infrastructure Strategy. Key opportunities for strategic green infrastructure enhancement, linkage and creation to be explored.

Enhancements to public rights of way network with proposed public rights of way or permissive path links, including along the alignment of the corridor for potential future canal diversion. This would improve accessibility within this strategic green infrastructure corridor.

Bird hides may be incorporated within the wetland area.

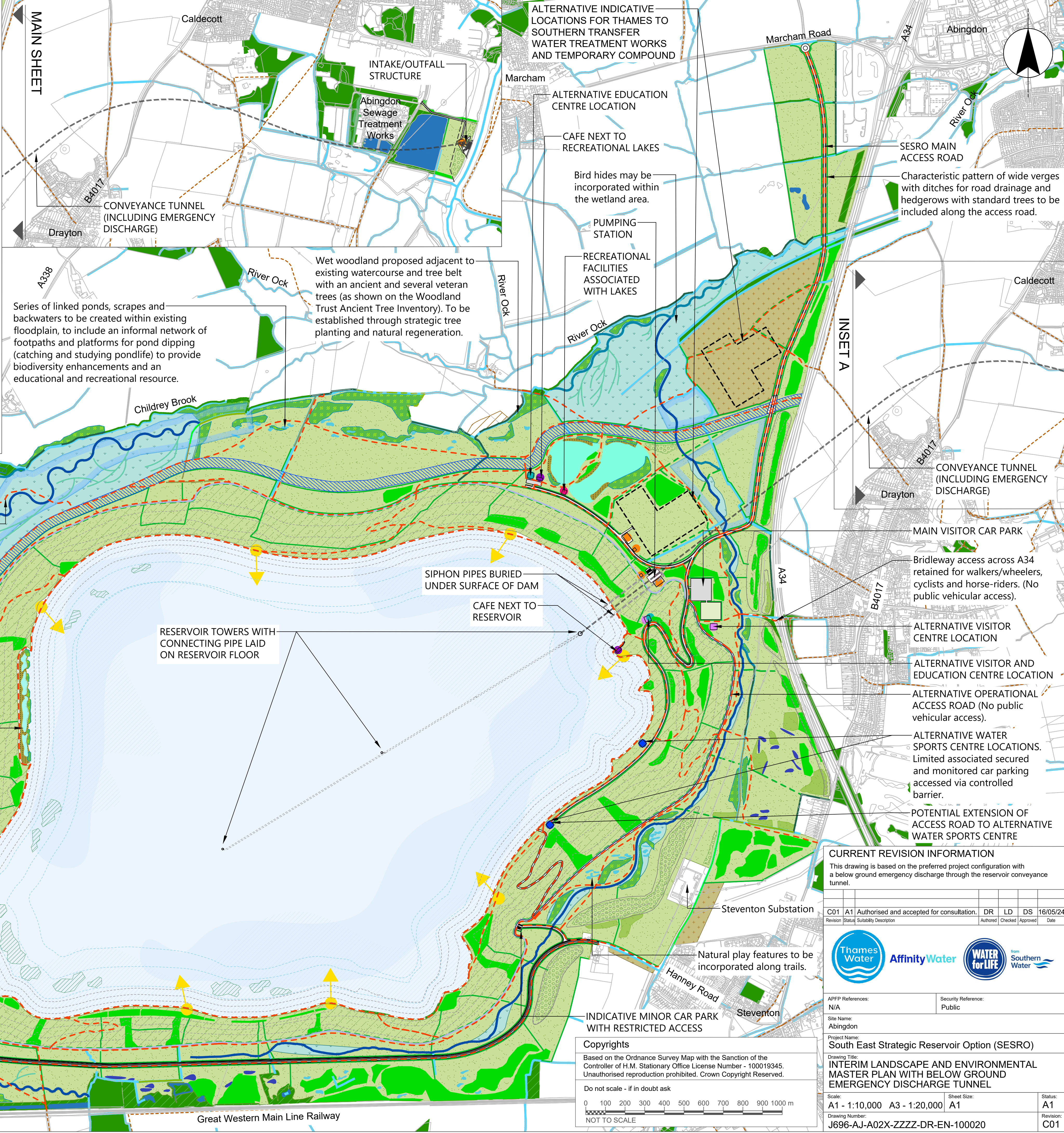
Existing hedgerow along A338 to be retained and enhanced.

Wetland lagoons with marginal habitat and wet woodland for biodiversity and visual amenity enhancement.

INDICATIVE MINOR CAR PARK WITH RESTRICTED ACCESS

Hedgerows, small woodlands and woodland copses proposed on reservoir embankments for habitat connectivity and to help to integrate the embankments into the surrounding landscape.

**Notes**  
1. Key infrastructure and recreational facilities are labelled in capitals.  
2. Refer to J696-AJ-A02X-ZZZZ-DR-EN-100034, J696-AJ-A02X-ZZZZ-DR-EN-100035 and J696-AJ-A02X-ZZZZ-DR-EN-100036 Interim Landscape and Environmental Master Plan Indicative Embankment Cross Sections (Sheet 1 to 3).



Characteristic pattern of wide verges with ditches for road drainage and hedgerows with standard trees to be included along the access road.

Wet woodland proposed adjacent to existing watercourse and tree belt with an ancient and several veteran trees (as shown on the Woodland Trust Ancient Tree Inventory). To be established through strategic tree planting and natural regeneration.

Series of linked ponds, scrapes and backwaters to be created within existing floodplain, to include an informal network of footpaths and platforms for pond dipping (catching and studying pondlife) to provide biodiversity enhancements and an educational and recreational resource.

Bird hides may be incorporated within the wetland area.

RESERVOIR TOWERS WITH CONNECTING PIPE LAID ON RESERVOIR FLOOR

SIPHON PIPES BURIED UNDER SURFACE OF DAM

CAFE NEXT TO RESERVOIR

ALTERNATIVE VISITOR CENTRE LOCATION

ALTERNATIVE VISITOR AND EDUCATION CENTRE LOCATION

ALTERNATIVE OPERATIONAL ACCESS ROAD (No public vehicular access).

ALTERNATIVE WATER SPORTS CENTRE LOCATIONS. Limited associated secured and monitored car parking accessed via controlled barrier.

POTENTIAL EXTENSION OF ACCESS ROAD TO ALTERNATIVE WATER SPORTS CENTRE

**CURRENT REVISION INFORMATION**  
This drawing is based on the preferred project configuration with a below ground emergency discharge through the reservoir conveyance tunnel.

Revision	Status	Subsity	Description	DR	LD	DS	16/05/24
C01	A1	Authorised and accepted for consultation.		DR	LD	DS	16/05/24



APFP References: N/A Security Reference: Public

Site Name: Abingdon

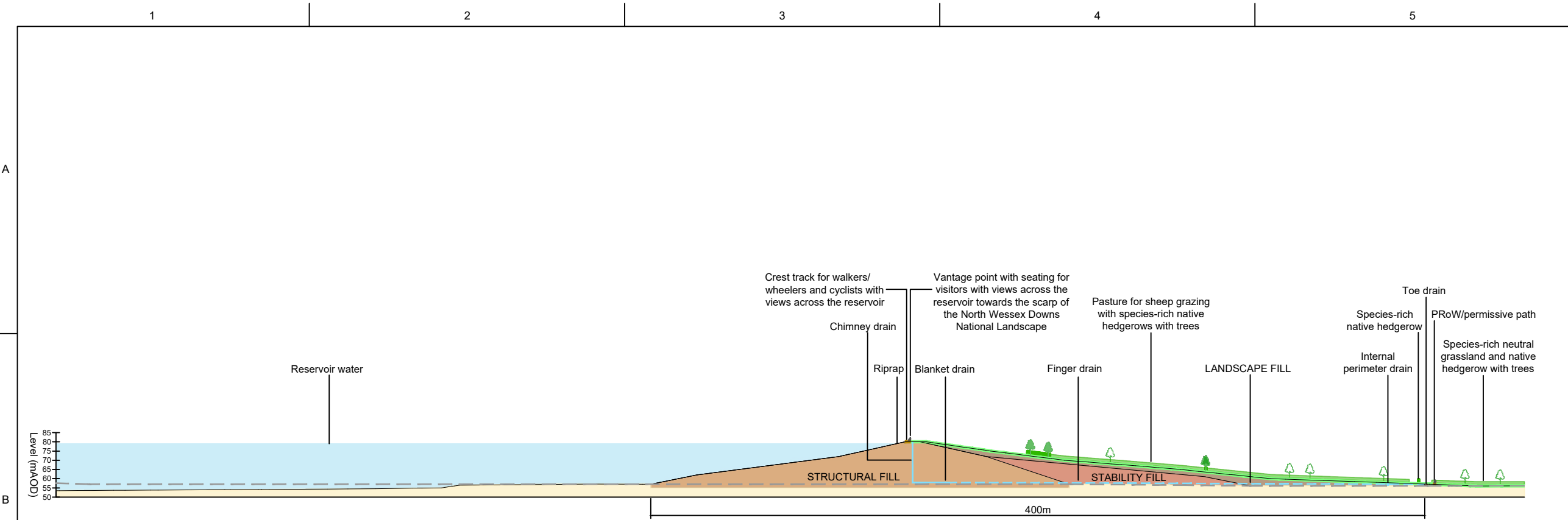
Project Name: South East Strategic Reservoir Option (SESRO)

Drawing Title: INTERIM LANDSCAPE AND ENVIRONMENTAL MASTER PLAN WITH BELOW GROUND EMERGENCY DISCHARGE TUNNEL

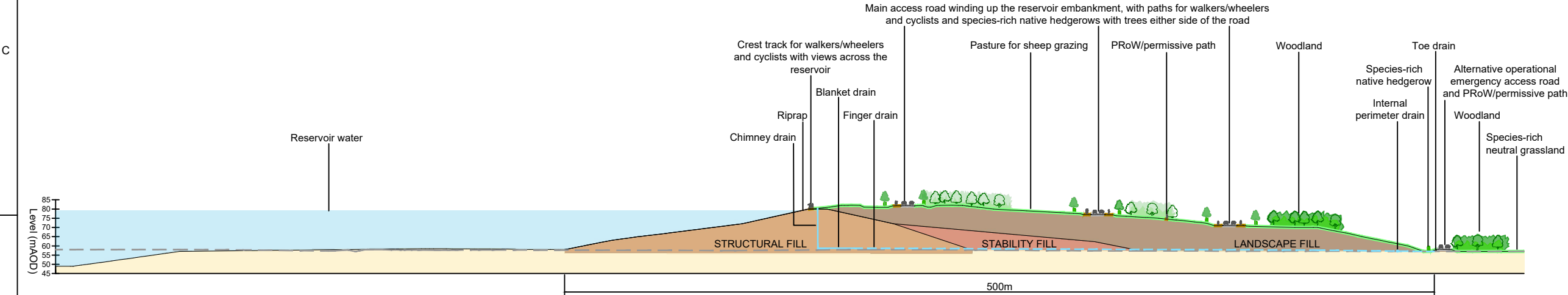
Scale: A1 - 1:10,000 A3 - 1:20,000 A1	Sheet Size:	Status: A1
Drawing Number: J696-AJ-A02X-ZZZZ-DR-EN-100020	Revision: C01	



## Appendix E Interim Landscape and Environmental Master Plan Cross Sections

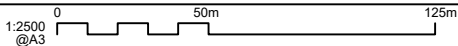


Section A-A' - South of Marcham  
Scale 1:2,500



Section B-B' - West of Drayton  
Scale 1:2,500

- Notes**
- Embankment stability analysis in progress and adjustments to slopes and fill will be made as required as the design progresses.
  - All dimensions on the drawing are indicative.



Do not scale - if in doubt ask

**Location Plan Scale 1:100,000**

**Legend**

- Existing ground level
- Existing ground
- Proposed ground level
- Proposed reservoir embankment structural fill
- Proposed reservoir embankment stability fill
- Proposed reservoir embankment landscape fill
- Proposed reservoir embankment drainage
- Proposed reservoir water at full capacity
- Proposed access road
- Proposed public rights of way (PRoW)/permissive path
- Proposed grassland
- Proposed species-rich native hedgerow
- Proposed species-rich native hedgerow with trees
- Proposed intermittent trees and shrubs
- Proposed woodland and copse
- Proposed floating island

**Glossary**

AOD - Above Ordnance Datum (i.e., sea level).

Structural fill - Embankment fill to ensure structural integrity and watertightness of reservoir embankment. Would comprise compacted, site-won clay.

Stability fill - Embankment fill placed where a stabilising weight is needed. Would comprise site-won subsoils which are unsuitable for structural fill.

Landscape fill - Embankment fill to enable planting and to vary the embankment height and profile, to help with landscape integration. Would comprise site topsoil and subsoil which are unsuitable for structural fill.

Riprap - Interlocking blocks of natural stone in varying sizes to protect inner face of reservoir embankment against erosion.

Embankment drainage: Internal embankment drains would comprise chimney, blanket and finger drains formed of imported sands and gravels. These would safely intercept and convey any embankment seepage to the outer embankment toe, prevent the migration of clay particles, drain the outer embankment shoulder (enhancing stability) and enable monitoring of seepage.

Chimney drain - Continuous vertical drain behind the embankment crest.

Blanket drain - Continuous horizontal drain at the base of the chimney drain.

Finger drain - Horizontal drains of gravel, at regular intervals below the outer embankment shoulder, conveying any seepage water to the internal perimeter drain.

Internal perimeter drain - Horizontal drain just inside the embankment toe, which would collect water from the finger drains and discharge this to the toe drain via pipes and chambers where the flow could be measured.

Toe drain - Open channel around outer embankment toe to receive water discharged from the internal drainage system. Would also receive runoff from the embankment shoulder in the event of very heavy rainfall.

Groundwater drain - Deep trench filled with gravel which would intercept groundwater flows that would be blocked by the reservoir embankment and convey these around either side of the embankment without causing the local water table to rise.

**References**

J696-AJ-A02X-ZZZZ-DR-EN-100020 Interim Landscape and Environmental Master Plan with Below Ground Emergency Discharge Tunnel.

**Disclaimer**

The proposals illustrated on the cross sections on this drawing are indicative, for illustrative purposes only and subject to consultation, stakeholder engagement and further design development.

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**Current Revision Information**

Interim cross section content based upon the Interim Landscape and Environmental Master Plan with Below Ground Emergency Discharge Tunnel.

Revision	Status	Subsidiary Description	Author	Checked	Reviewed	Date
C01	A1	Authorised and accepted for consultation.	DR	LD	DS	14/05/24



APPP References: N/A  
Security Reference: Public

Site Name: Abingdon

Project Name: J696 South East Strategic Reservoir Option (SESRO)

Drawing Title: INTERIM LANDSCAPE AND ENVIRONMENTAL MASTER PLAN INDICATIVE EMBANKMENT CROSS SECTIONS - SHEET 1 OF 3

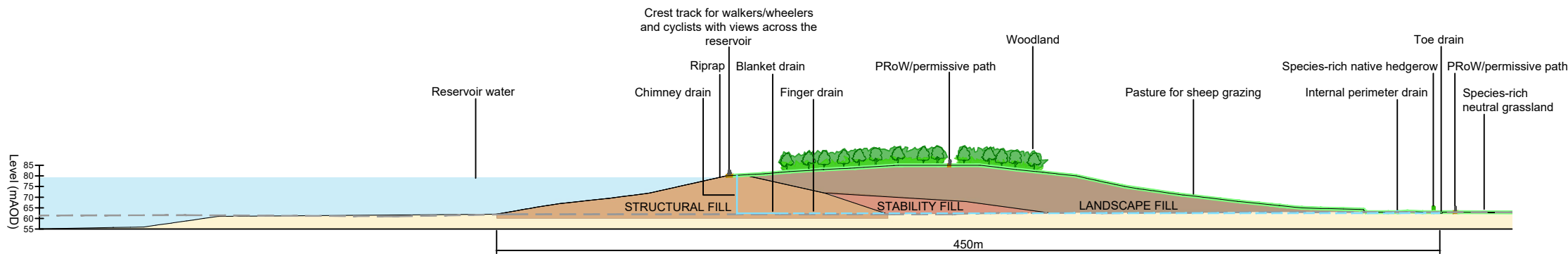
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Drawing Number: J696-AJ-A02X-ZZZZ-DR-EN-100034	Revision: C01	

A

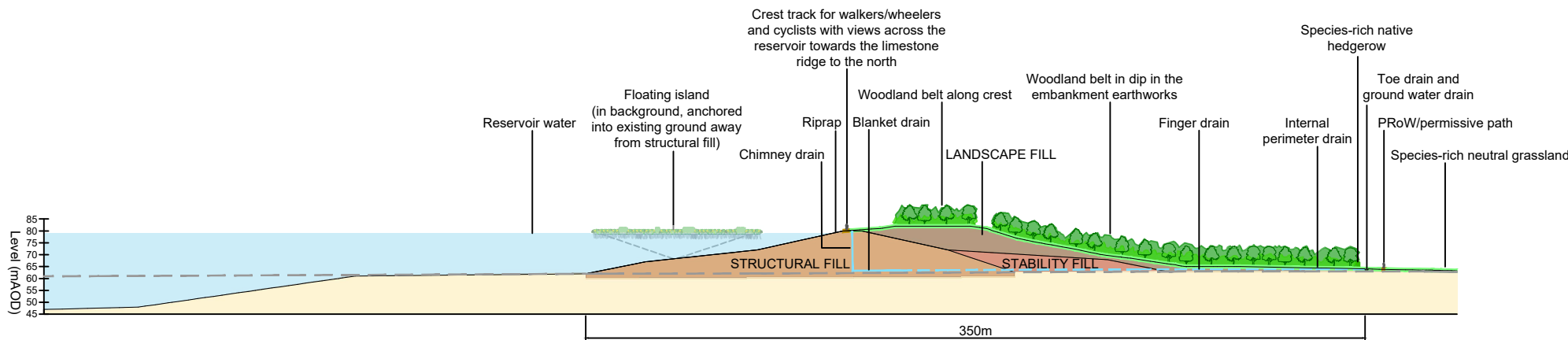
B

C

D

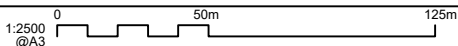


Section C-C' - West of Steventon  
Scale 1:2,500



Section D-D' - North of Great Western Main Line Railway  
Scale 1:2,500

- Notes
- Embankment stability analysis in progress and adjustments to slopes and fill will be made as required as the design progresses.
  - All dimensions on the drawing are indicative.



Do not scale - if in doubt ask

Location Plan Scale 1:100,000

Legend

- Existing ground level
- Existing ground
- Proposed ground level
- Proposed reservoir embankment structural fill
- Proposed reservoir embankment stability fill
- Proposed reservoir embankment landscape fill
- Proposed reservoir embankment drainage
- Proposed reservoir water at full capacity
- Proposed access road
- Proposed public rights of way (PRow)/permissive path
- Proposed grassland
- Proposed species-rich native hedgerow
- Proposed species-rich native hedgerow with trees
- Proposed intermittent trees and shrubs
- Proposed woodland and copse
- Proposed floating island

**Glossary**

AOD - Above Ordnance Datum (i.e., sea level).

Structural fill - Embankment fill to ensure structural integrity and watertightness of reservoir embankment. Would comprise compacted, site-won clay.

Stability fill - Embankment fill placed where a stabilising weight is needed. Would comprise site-won subsoils which are unsuitable for structural fill.

Landscape fill - Embankment fill to enable planting and to vary the embankment height and profile, to help with landscape integration. Would comprise site topsoil and subsoil which are unsuitable for structural fill.

Riprap - Interlocking blocks of natural stone in varying sizes to protect inner face of reservoir embankment against erosion.

Embankment drainage: Internal embankment drains would comprise chimney, blanket and finger drains formed of imported sands and gravels. These would safely intercept and convey any embankment seepage to the outer embankment toe, prevent the migration of clay particles, drain the outer embankment shoulder (enhancing stability) and enable monitoring of seepage.

Chimney drain - Continuous vertical drain behind the embankment crest.

Blanket drain - Continuous horizontal drain at the base of the chimney drain.

Finger drain - Horizontal drains of gravel, at regular intervals below the outer embankment shoulder, conveying any seepage water to the internal perimeter drain.

Internal perimeter drain - Horizontal drain just inside the embankment toe, which would collect water from the finger drains and discharge this to the toe drain via pipes and chambers where the flow could be measured.

Toe drain - Open channel around outer embankment toe to receive water discharged from the internal drainage system. Would also receive runoff from the embankment shoulder in the event of very heavy rainfall.

Groundwater drain - Deep trench filled with gravel which would intercept groundwater flows that would be blocked by the reservoir embankment and convey these around either side of the embankment without causing the local water table to rise.

**References**

J696-AJ-A02X-ZZZZ-DR-EN-100020 Interim Landscape and Environmental Master Plan with Below Ground Emergency Discharge Tunnel.

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**Current Revision Information**

Interim cross section content based upon the Interim Landscape and Environmental Master Plan with Below Ground Emergency Discharge Tunnel.

Revision	Status	Subsidiary Description	Author	Checked	Reviewed	Date
C01	A1	Authorised and accepted for consultation.	DR	LD	DS	14/05/24



APPP References: N/A  
Security Reference: Public

Site Name: Abingdon

Project Name: J696 South East Strategic Reservoir Option (SESRO)

Drawing Title: INTERIM LANDSCAPE AND ENVIRONMENTAL MASTER PLAN INDICATIVE EMBANKMENT CROSS SECTIONS - SHEET 2 OF 3

Scale: 1:2,500  
Sheet Size: A3  
Status: A1

Drawing Number: J696-AJ-A02X-ZZZZ-DR-EN-100035  
Revision: C01





## Appendix F Indicative Master Plan 2022

F.1.1 The Indicative Master Plan 2022<sup>43</sup> is included for information and ease of reference and has not been updated since 2022.

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<sup>43</sup> This figure was included as Figure 2: Landscape and Environmental Design Strategy Plan in the Technical Supporting Document B2, Terrestrial Environmental Appraisal Report. Thames Water and Affinity Water (2022). South East Strategic Reservoir Option (SESRO). Technical Supporting Document B2. Terrestrial Environmental Appraisal Report Figures. Online. Available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/B-2---SESRO-EAR-Terrestrial-Figures.pdf>. Accessed May 2024.



Legend

- Existing:**

  - Public Rights of Way
  - Woodland to be Retained as far as Practicable
  - Watercourse to be Retained

**Proposed:**

  - Reservoir Water Extent
  - Crest of Reservoir Embankment
  - Inner Toe of Reservoir Embankment and Borrow Pit Contours
  - Indicative Embankment and Bund Contours
  - Corridor for Future Canal Diversion
  - Public Rights of Way
  - Indicative Vantage Point with Seating Area for Views towards AONB and Midvale Ridge
  - Car Park with Hardstanding
  - Car Park with Reinforced Grass
  - Visitor / Community Centre
  - Cafe
  - Education Centre
  - Sailing Clubhouse
- Proposed:**

  - Indicative Replacement Floodplain Storage
  - Auxiliary Drawdown Channel Water Extent
  - Watercourse Diversion
  - Watercourse Realignments
  - Wetland Ditch
  - Perimeter Ditch
  - Wetland Habitat Mosaic with Reeds, Species Rich Wet Grassland and Floodplain Marsh
  - Floating Islands
  - Ecology Ponds and Lakes with Marginal Planting
  - Hedgerow with Intermittent Standard Trees
  - Hedgerow and Tree Belt to be Retained as far as Practicable and Enhanced
  - Pasture for Sheep Grazing
  - Species Rich Neutral Grassland
  - Scrub
  - Intermittent Trees and Shrubs
  - Woodland and Copse
  - Wet Woodland
  - Land to be Reinstated and Returned to Agriculture
  - Land to be Reinstated to Existing Use





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