SESRO

Access and Diversion Roads Options Appraisal Report

J696-DN-A01A-ZZZZ-RP-ZD-100009

May 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.

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Glossary

Term	Definition
Gate 3 Interim Landscape and Environmental Master Plan	This is the master plan that is being developed for inclusion in the public consultation in 2024. It is a revision to the Indicative Gate 2 Master Plan based on work undertaken for the development of the SESRO project since the Gate 2 RAPID submission.
Indicative Gate 2 Master Plan	The SESRO master plan developed for the Gate 2 RAPID submission (November 2022).
National Policy Statement (NPS) for Water Resources Infrastructure	A policy paper by the Department for Environment Food & Rural Affairs (Defra) designated in September 2023 that sets out the government's policies for developing nationally significant infrastructure projects for water resources in England. Full information on the NPS for Water Resource Infrastructure is available online at: https://www.gov.uk/government/publications/national-policy-statement-for-water-resources-infrastructure
Nationally Significant Infrastructure Project (NSIP)	The Planning Act 2008 introduced a new bespoke consenting route for major infrastructure projects in the fields of energy, transport, water, waste and wastewater. An NSIP is a project that can be consented via this route.
Preferred Option	The preferred option at this time, following the option appraisal undertaken working towards the Gate 3 submission but before the public consultation in 2024. It is the preferred option for master planning (i.e., for development of the Gate 3 Interim Landscape and Environmental Master Plan) and for public consultation in summer 2024.
Red/Amber/Green (RAG) Score	Red, Amber, Green (RAG) scoring categories were used to inform the scale of the impact or benefit of each option against each of the appraisal criteria. The RAG 'score' represents a subject-matter expert judgement based on the evidence evaluated in the options appraisal.
Regulators' Alliance for Progressing Infrastructure Development (RAPID)	An alliance of the three water regulators Ofwat, the Environment Agency and the Drinking Water Inspectorate formed to help accelerate the development of water infrastructure and design future regulatory frameworks. Full information on RAPID is available online at: https://www.ofwat.gov.uk/regulated-companies/rapid/
South East Strategic Reservoir Option (SESRO) Project	The concept for the South East Strategic Reservoir Option is to abstract water from the River Thames near Culham when sufficient flow is available, store it in a non-impounding raw water reservoir, located to the south west

Term	Definition
	of Abingdon in Oxfordshire, and release it to the same river reach to augment flow in the river for downstream abstraction at times of low flow. Stored reservoir water would also be transferred directly to treatment and supply.
Water Resource Management Plan (WRMP)	Plans that must be produced by water companies every five years to set out how they will continue to supply water in their supply area over (at least) the next 25 years.
Water Resources South East (WRSE)	An alliance of the six water companies that cover the South East region of England, which are Thames Water, Affinity Water, South East Water, Southern Water, Portsmouth Water and Sutton & East Surrey (SES) Water. Full information on WRSE is available online at: https://www.wrse.org.uk/
National Landscape	The revised name for Area of Outstanding Natural Beauty (AONB) – November 2023. Note that in the Appendices National Landscape may still be referred to as AONB.

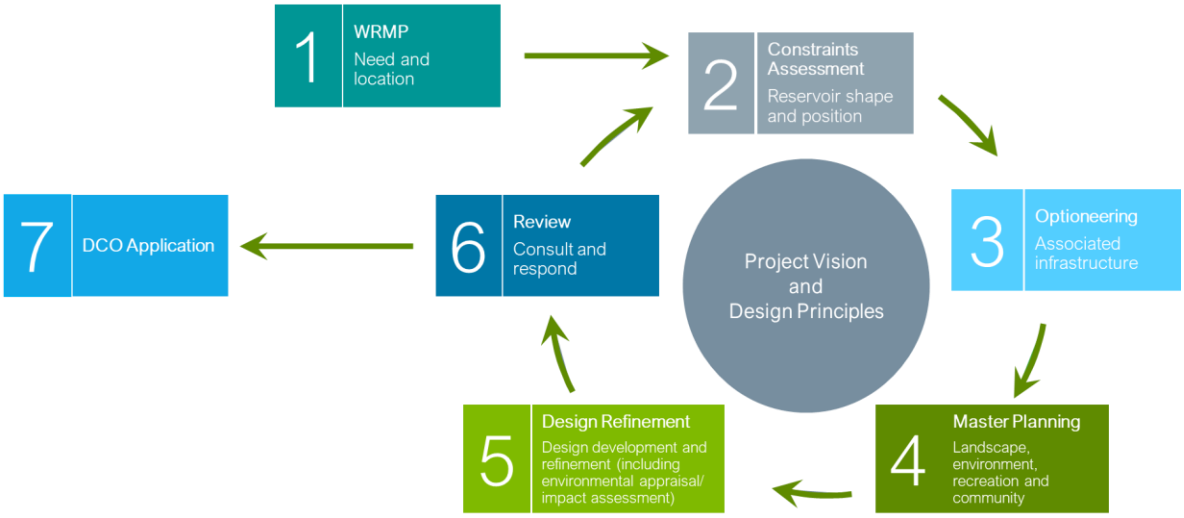
Source: Thames Water Internal, 2024

Executive Summary

The South East Strategic Reservoir Option (SESRO) is a strategic resource to the south east to secure water supplied for Thames Water, Affinity Water and Southern Water customers. The project is being developed for RAPID Gate 3 submission and an application for a Development Consent Order (DCO) under the Planning Act 2008 regime.

Stage 3 of the SESRO Multi-Disciplinary Design Development Process in Figure 0.1 is the optioneering of associated infrastructure for the reservoir. Access roads (for construction and operation of the reservoir) and road diversions (required to facilitate the SESRO project) are considered part of the essential associated infrastructure for the reservoir. There are options for the configuration and layout of roads for the SESRO project.

Figure 0.1: SESRO Multi-Disciplinary Design Development Process



Source: Thames Water Internal, 2024

This report sets out the options appraisal undertaken, working towards the Gate 3 submission, to identify preferred alignments (for master planning and consultation) for the following:

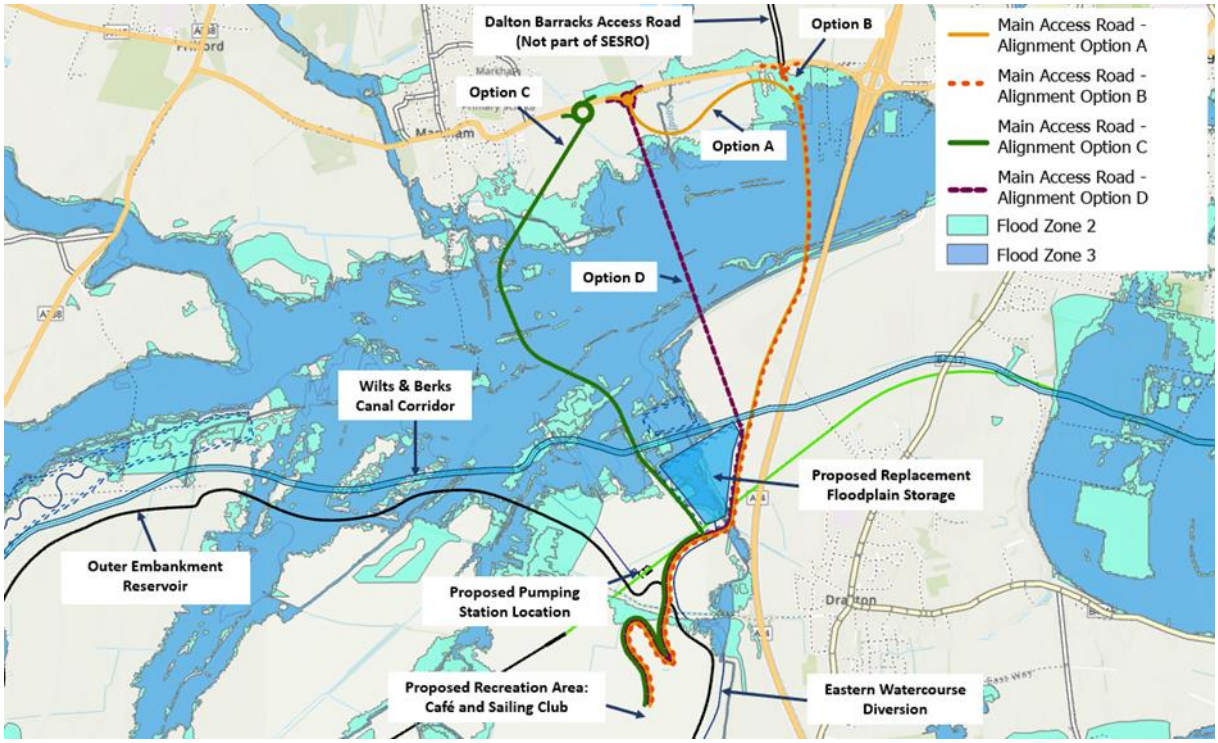
- The SESRO main access road - a new road for the main access to the SESRO site required to provide both temporary construction access and permanent access to the reservoir for operational purposes and public visitors.
- The Steventon to East Hanney road diversion - a permanent road diversion to relocate the existing road that currently connects Steventon and East Hanney and needs to be relocated for SESRO to be constructed.

To identify the preferred options for master planning and consultation, the options appraisal process detailed fully in the SESRO Options Appraisal Context and Methodology Report was followed. The outcomes of the appraisal studies reported in this road report were as follows:

- **The SESRO main access road** – Option B is the preferred option of the four alignment options defined and assessed in this appraisal study, shown in Figure 0.2.
- **The Steventon to East Hanney road diversion -** Option A is the preferred option of the four alignment options defined and assessed in this appraisal study, shown in Figure 0.3.

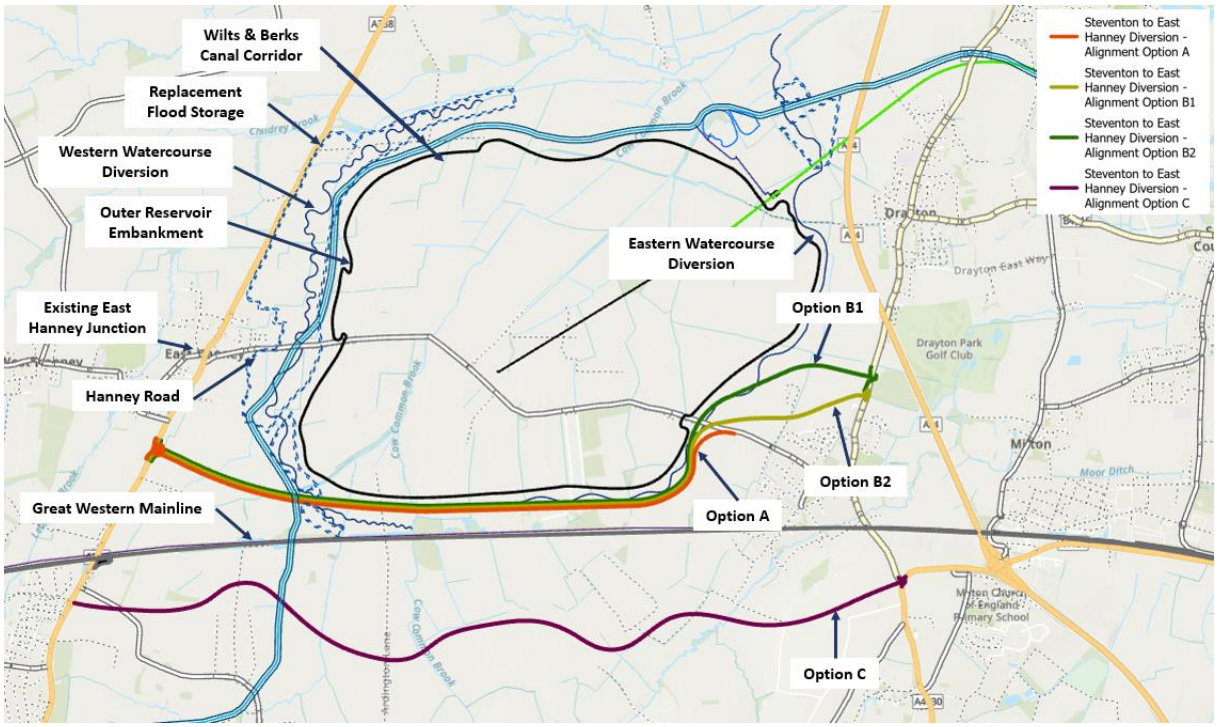
A more detailed summary of conclusions is presented in Section 11 of this report.

Figure 0.2: SESRO Main Access Road – Alignment Options



Source: Esri, Intermap, NASA, NGA, USGS | Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS; Contains public sector information licensed under the Open Government Licence v3.24

Figure 0.3: Steventon to East Hanney Diversion Road - Alignment Options



Source: Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

The provision of a publicly accessible interconnecting road between the SESRO main access road and the Steventon to East Hanney road diversion has been discounted at this stage as it would have an adverse impact on Oxfordshire County Council (OCC) transport planning for the local road network by potentially introducing traffic to local communities.

Following on from these options appraisals, working towards Gate 3 submission, the next stage in the SESRO design development process (as set out in Figure 0.1) is to develop the SESRO Gate 3 Interim Landscape and Environmental Master Plan for inclusion in the public consultation in 2024, using the outcome of options appraisals for the associated infrastructure.

It is expected that the access and diversion roads options appraisals will be backchecked in Autumn 2024 to consider changes and/or additional information that may have been identified by that time through the Gate 3 design development work (including the development of the Gate 3 Interim Landscape and Environmental Master Plan) and/or the Summer 2024 non-statutory consultation.

Next steps specific for the access and diversion roads are included within Section 11 of this report. For the preferred option for the main access road to the SESRO reservoir site, Option B, it will be necessary for the SESRO project development team to remain up to date with progress and the latest developments of external partnership schemes which may impact on the alignment, including any new or revised schemes that may come forwards through consultation on the Vale of White Horse and South Oxfordshire

draft Joint Local Plan as it moves through consultation and examination stages. These schemes include:

- The allocation of the Dalton Barracks site for residential development.
- The identified area for a potential Flood Storage Reservoir (FSR) for Abingdon, which could be developed by the Environment Agency.
- The identified area for a possible future South Marcham Bypass (also known as the Marcham Movement Corridor), proposed by the Vale of White Horse Council, South Oxfordshire Council and Oxfordshire County Council.
- The identified area for a possible future South Abingdon-on-Thames Bypass (also known as the Southern Abingdon Movement Corridor), proposed by the Vale of White Horse Council, South Oxfordshire Council and Oxfordshire County Council.
- The identified areas for a potential Wantage and Grove Station for passenger rail travel, proposed by the Vale of White Horse Council, South Oxfordshire Council and Oxfordshire County Council.

1 Introduction

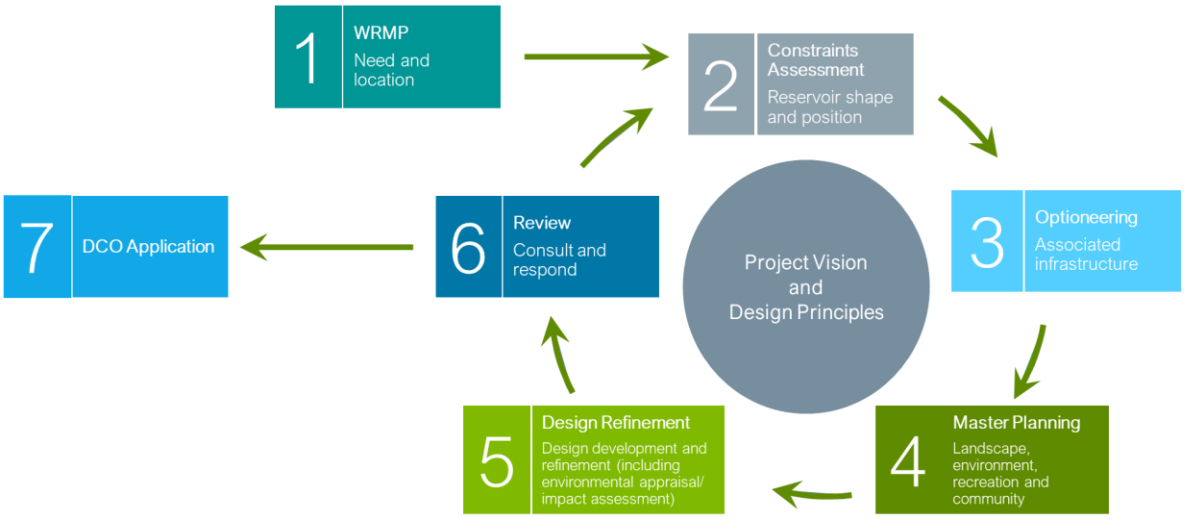
This section provides an overview of the purpose of this report and its relationship to the other SESRO option appraisal reports. It also identifies the access and diversion roads considered as essential associated infrastructure for the reservoir for which options appraisals were carried out working towards the Gate 3 submission.

1.1 Purpose of this Report

1.1.1 The South East Strategic Reservoir Option (SESRO) is a strategic resource to the south east to secure water supplied for Thames Water, Affinity Water and Southern Water customers. The project is being developed for RAPID Gate 3 submission and an application for a Development Consent Order (DCO) under the Planning Act 2008 regime.

1.1.2 The SESRO Design Development Process (shown in Figure 1.1 below) is outlined in the SESRO Options Appraisal Context and Methodology Report[1]. Stage 3 of this process is the optioneering of associated infrastructure and for Gate 3, options appraisals were undertaken for infrastructure identified as being essential associated infrastructure for the reservoir.

Figure 1.1 SESRO Multi-Disciplinary Design Development Process



Source: Thames Water Internal, 2024

1.1.3 Access roads (for construction and operation of the reservoir) and road diversions (required to facilitate the SESRO project) are considered part of the essential associated infrastructure for the reservoir. There are options for the configuration and layout of roads for the SESRO project. This report sets out the options appraisal undertaken working towards the Gate 3 submission.

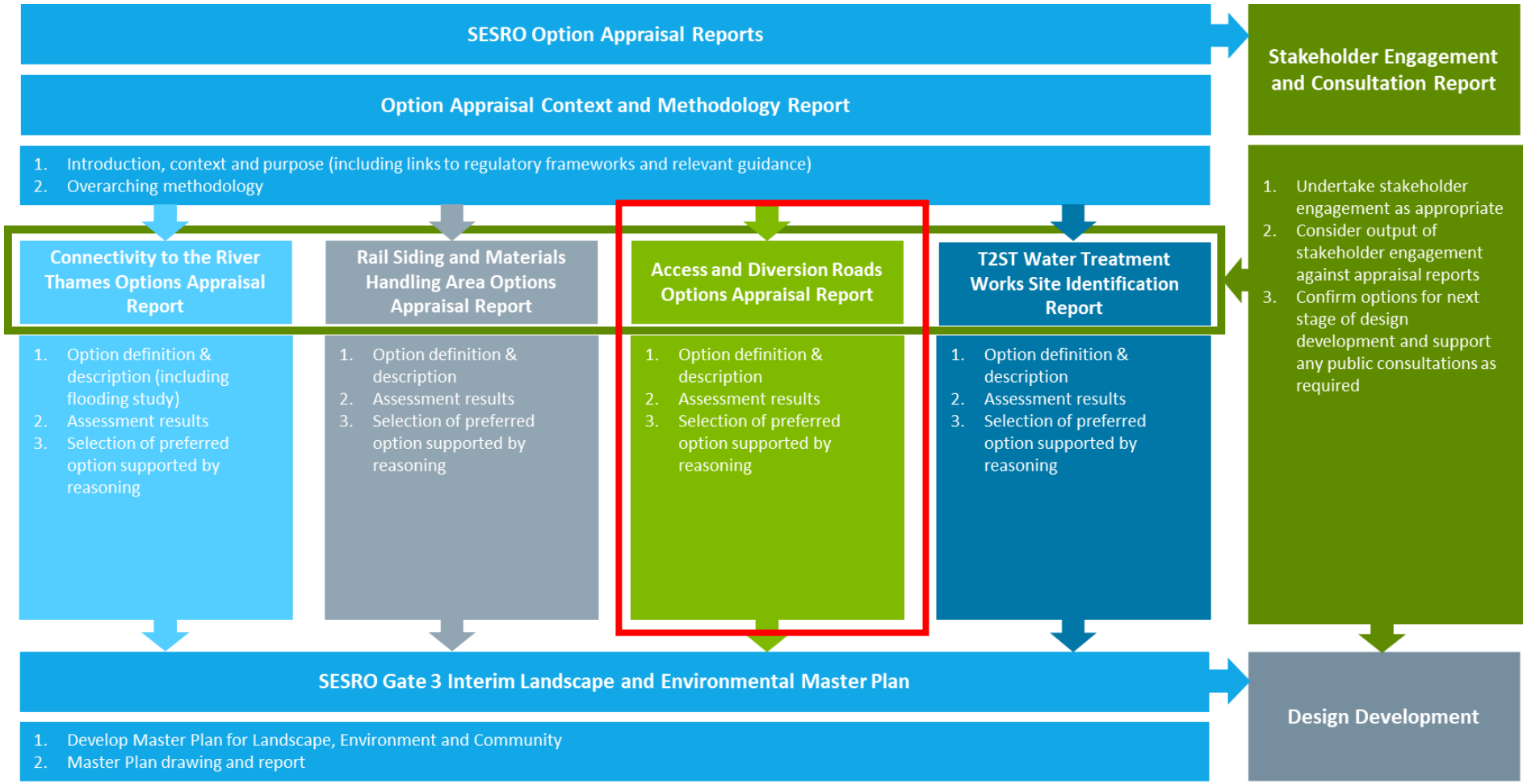
1.1.4 The report forms part of a suite of option reports, as shown in Figure 1.2. The

[1] SESRO Option Appraisal Context and Methodology Report, J696-DN-A01A-ZZZZ-RP-ZD-100006

SESRO Option Appraisal Context and Methodology Report describes the approach and methodology adopted for the option appraisals.

Figure 1.2: SESRO Options Appraisal Document Suite

Note that this report is outlined in red in the document suite.



Source: Thames Water Internal, 2024

1.2 Roads Identified for Options Appraisal

1.2.1 Roads need to be constructed for the SESRO project to meet the following requirements. There are both temporary requirements for construction and permanent access requirements, as below.

Temporary Road Requirements

- Access to the SESRO site from the strategic road network needs to be provided for material import by road during construction. There will be haul roads around the SESRO site for construction activities, and these haul roads need to be linked and accessible.
- Access also needs to be provided to the SESRO site during construction for the workforce. The number of workforce trips to the site would vary over the course of construction and there would be a mix of daily commuters and weekly commuters.

Permanent Requirements

- Permanent access needs to be provided to the SESRO site, once the reservoir is operational, for the operation and maintenance of the reservoir and associated infrastructure. Access to the reservoir during its operation will need to be maintained during flood events with a 1 in 100-year return period (+ 70% to account for climate change).
- Access to the reservoir, once operational, needs to be provided to the public, visiting for leisure and recreational purposes for example.
- Access between Steventon and East Hanney needs to be permanently maintained because the existing road (Hanney Road), which connects Steventon and East Hanney, passes through the extents of the proposed reservoir and must be diverted.

1.2.2 To fulfil the requirements listed above, and following a review of the constraints as detailed in Sections 3 and 7, it was identified that two new roads are required for the SESRO project.

- SESRO main access road: a new main access road to the SESRO site is required to provide both temporary construction access and permanent access to the reservoir for operational purposes (reservoir operation and maintenance) and public visitors.
- Steventon to East Hanney road diversion: for SESRO to be constructed there is a need to relocate the road (Steventon Road/ Hanney Road) that currently connects Steventon and East Hanney.

1.2.3 The review of the constraints (as detailed in Section 3) identified that the main access road should join to the A415 to the north east corner of the reservoir, whilst the Steventon to East Hanney diversion would need to be located to the south of the reservoir. Hence two separate roads are required.

1.2.4 It should be noted that the requirements listed above are for roads being considered as part of the essential associated infrastructure for the reservoir,

which have been identified as the SESRO main access road and Steventon to East Hanney road diversion. There may be other roads required for other purposes and requirements, such as temporary haul roads during construction of the reservoir, which are not within the scope of the options appraisals undertaken working towards the Gate 3 submission.

1.2.5 This report describes the options appraisals undertaken for Gate 3 to identify a preferred alignment for the new main access road to the SESRO site and for the permanent road diversion connecting Steventon and East Hanney. These appraisals build on the preliminary work undertaken at Gate 2, which also considered locations for the main access road and the Steventon to East Hanney road diversion. Sections 3 to 6 of this report cover the options appraisal of the SESRO main access road, while sections 7 to 10 cover the options appraisal of the road diversion.

1.2.6 It was considered whether it would be appropriate to appraise a permanent interconnecting public road, linking the SESRO main access road and the Steventon to East Hanney road diversion and providing an alternative local link between Marcham and Steventon (and on to East Hanney). It was identified however that this interconnecting road would likely have an adverse impact on transport planning for the local road network. Potential issues identified for the interconnecting road include:

- An interconnecting road may create a new north-to-south route for vehicular traffic, bypassing congestion on the Strategic Road Network on the A34. This may reroute local traffic flows and increase the amount of traffic within local towns including Steventon, Marcham and/or East Hanney, which would likely have an adverse impact on these communities.
- An interconnecting road has the potential to promote the increased usage of vehicle trips made by private vehicles by the creation of a new road route and potential to increase car usage in the local area, which would not comply with Oxfordshire County Council (OCC) policies regarding sustainable transport.
- An interconnecting road may take traffic away from Frilford and East Hanney, creating an unofficial localised bypass, which would concern OCC as it would not comply with their Local Transport and Connectivity Plan 2022 – 2050 (published July 2022) and could potentially increase local traffic.

1.2.7 On the basis that this interconnecting road would be required to fulfil any of the road requirements listed in paragraph 1.2.1 and due to the potential issues initially identified (above), this potential interconnecting road was not taken through an options appraisal for Gate 3 as part of the essential infrastructure for the reservoir.

1.3 Backchecking and Changes to this Report

1.3.1 This is the first revision of this report and therefore no backchecking has been undertaken. In future revisions this section will summarise any backchecking undertaken that is specific to the road options appraisals and any changes to the report since the previous revision.

1.3.2 It is expected that the next backcheck of the road options will be carried out in Autumn 2024 to consider changes and/or additional information, which may have been identified by that time through the Gate 3 design development work, including the development of the Gate 3 Interim Landscape and Environmental Master Plan. This will include a review of any assumptions used within this appraisal from the Indicative Gate 2 Masterplan and any changes required following the development of the Gate 3 Interim Landscape and Environmental Master Plan. A timetable for backchecking beyond Autumn 2024 will be decided dependent on future need, with interim backchecks to be undertaken sooner if a significant change is identified before Autumn 2024.

1.3.3 It is noted that at the time of this appraisal, there had been limited access to the SESRO site for surveys and investigations, such as terrestrial and aquatic ecological surveys due to landowner permissions being negotiated centrally which has taken time, and as such this appraisal has been completed using available desk-based information. These assessments will need to be backchecked following completion of surveys.

2 Options Appraisal Methodology

The section outlines the options appraisal methodology for the SESRO main access road and the Steventon to East Hanney road diversion, following the appraisal steps in the common approach set out in the SESRO Option Appraisal Context and Methodology Report.

2.1 Overview of Appraisal Methodology

2.1.1 The SESRO Option Appraisal Context and Methodology Report sets out the appraisal methodology, which is a common approach that has been adopted for all the option appraisal studies undertaken for the essential associated infrastructure and working towards the Gate 3 submission.

2.1.2 A summary of the activities undertaken for the roads options appraisals is provided below, in line with the steps in the appraisal methodology.

2.2 Appraisal Step 1: Define Scope and Objectives of Appraisal

2.2.1 The definition of the scope and objectives of options appraisal for Gate 3 was undertaken at a project level and reported in the SESRO Option Appraisal Context and Methodology Report. That report identifies all the essential associated infrastructure for the reservoir and also sets out the overarching purpose of the options appraisals to support progress towards DCO submission and a Gate 3 submission to RAPID.

2.2.2 The options appraisal detailed in this road report was undertaken to identify preferences for the SESRO main access road and the Steventon to East Hanney road diversion, considered essential associated infrastructure for the reservoir.

2.3 Appraisal Step 2: Define Constraints on Option Definition

2.3.1 The constraints identified on the definition of options for the SESRO main access road are presented in Section 3 of this report. The constraints for the Steventon to East Hanney road diversion are in Section 7.

2.3.2 A staged assessment, for example pre-screening, for appraising options was not required for either the main access road or the Steventon to East Hanney road diversion. This is due to the limited number of possible options identified.

2.4 Appraisal Step 3: Develop Appraisal Criteria

2.4.1 The SESRO Criteria Table developed for the options appraisals of associated infrastructure can be found in Appendix A of the SESRO Option Appraisal Context and Methodology Report (J696-DN-A01A-ZZZZ-RP-ZD-100006).

2.4.2 Criteria descriptions in this table were developed under the key themes of Engineering (constructability and operability), cost and carbon, environmental performance, community, planning and property, and land acquisition.

2.4.3 In general, the criteria relate to key requirements and considerations for the SESRO project based on relevant legislation, policy, and guidance, as well as

operational and engineering requirements. They are therefore applicable across the different options appraisals for the associated infrastructure for the reservoir, including the Water Treatment Works (WTW), rail siding and materials handling areas, access and diversion roads, and connectivity to the River Thames.

2.4.4 Of the 132 criteria, 21 were not assessed in this study, 13 of these are specific criteria used for other appraisals and the remaining 8 were not used as they do not relate to the feasibility of the option, facilitate differentiation across road options or are already assessed under another criteria. Examples of these are:

- OPS7B – Sustainability – Power required for operation. This is not applicable to the appraisal of road alignments as there is no significant power required during operation.
- ENV22B -Minimise impacts associated with liquid discharge during operation, this is not applicable to the appraisal of road alignments as there is no liquid discharge.

2.4.5 A full list of the excluded RAG criteria and the reasoning for exclusion is within 1.1Appendix K.

2.4.6 The following criteria were developed for the assessment of the road options only:

- Third party Impact - Potential to disrupt the existing road network during enabling works and construction - included to consider road option impact on local networks.
- Third-Party Impact - Congestion at the relevant junctions for all movements, and the effective use of the transport network through innovative solutions – included to consider road option impact on local networks. The relevant junctions included the junction between the A34 and the A415, between the A338 and Steventon Road and later the junction between the A415 and the SESRO access road.
- Third party Impact - Impact on journey time reliability – included to consider road option impact on congestion of local networks.
- Transport Planning - An option may provide economic benefits by directing traffic through local town centres boosting their footfall and potential for people to stop and utilise the local economy – included to consider the socio-economic impact of route options.
- Transport Planning - Maximise the benefits of travel for non-motorised users between the immediate surrounding villages of Marcham, Garford, East Hanney, Steventon and Drayton to ensure road options consider integration routes for non-motorised users and how the PRoW network could be amended to better link these places to the reservoir site and improve links between them.

2.5 Appraisal Step 4: Define Options

2.5.1 The options for assessment were defined over the course of several discussions

amongst the subject matter experts, which consisted of engineers, terrestrial and aquatic environmentalists, and land, planning and property specialists.

2.5.2 Some of the options were identified in the earlier project development work reported at Gate 2 and have been progressed into this options appraisal process for further assessment and consideration, and some additional options have been developed for assessment so that all reasonable alternative options are considered.

2.5.3 A route was then developed for each option, which was technically feasible and avoided the key constraints identified in appraisal step 2. Each route was drawn up in a plan with an accompanying description ready for appraisal step 5 (outlined below).

2.5.4 A summary of appraisal step 4 for the SESRO main access road is presented in Section 4 of this report. The summary for the Steventon to East Hanney road diversion is in Section 8.

2.6 Appraisal Step 5: Undertake Individual Assessments

2.6.1 In this appraisal step, each option was reviewed and assessed by specialists (identified above) against the applicable criteria in the SESRO Criteria Table, which was developed in appraisal step 3. For each of the applicable criteria, an option was given a red, amber, or green (RAG) score. The RAG score indicates the performance of an option within the ambit of each criterion and the RAG score definitions are as follows:

- Red - A red RAG score is given for a specific option-criterion combination when the option performs poorly against the criterion. For each criterion a poor (or 'red') performance is defined in the SESRO Criteria Table because it is criteria specific, and a red RAG rating does not necessarily equate to a constraint that makes the option infeasible. A red score would however generally indicate the introduction of a significant risk, which may not be easy to mitigate, to the project from the option being assessed.
- Amber - An amber RAG score is given for a specific option-criterion combination when the option performs moderately against the criterion, neither poorly enough to warrant a red RAG score nor so well as to warrant a green score. For each criterion an amber score is defined fully in the SESRO Criteria Table because a 'moderate' performance is criteria-specific, so no generalisation of an amber score across the range of appraisal criteria can be made here.
- Green - A green RAG score is given for a specific option-criterion combination when the option performs well against the criterion. As with red and amber scores, a green RAG score is defined for each criterion specifically, as set out in the SESRO Criteria Table.

2.6.2 The SESRO Option Appraisal Context and Methodology Report contains further details on the RAG assessment method.

2.6.3 The RAG assessment for each road option was recorded in the format standard across the associated infrastructure options appraisals. The narratives from

relevant specialists documenting the reasoning behind why each RAG score was given for each road option are included within the appendices of this report.

2.6.4 A summary of appraisal step 5 for the SESRO main access road is presented in Section 5 of this report. The summary for the Steventon to East Hanney road diversion is presented in Section 9. In these report sections, the performance of each option in its assessment against the appraisal criteria is summarised into assessment subthemes, which are set out below.

Table 2.1: Appraisal Criteria Subthemes for the Access and Diversion Roads

Key Theme	Subtheme
Engineering - Constructability	Health and Safety
	Third Party Impact
	Logistics
	Programme
	Construction Complexity
Engineering - Operability	Health and Safety
	Operational Complexity
	Operational Resilience
	Transport Planning
Cost and Carbon	Cost
	Carbon
Environmental	Air Quality
	Aquatic Environment
	Biodiversity and Nature Conservation
	Biodiversity and Nature Conservation and Landscape
	Flood Risk
	Historic Environment
	Land Quality
	Landscape and Visual
	Noise
	Pollution
Community, Planning and Land	Socio-Economic
	Consenting
	Transport Planning
	Property and Land Acquisition

Source: Thames Water Internal, 2024

2.7 Appraisal Step 6: Workshop to Agree Preferred Option

2.7.1 Following the individual assessments in appraisal step 5, a workshop was held to bring together specialists to discuss the outputs of the assessments against the criteria, to identify a preferred option for the SESRO main access road and for the Steventon to East Hanney road diversion, and to record the reasons for the preferred options.

2.7.2 The assessment subthemes were used to help identify how the different options performed and identify any relevant differentiations between the options. While all the subthemes have degrees of relevance to consenting, in the sense of being decision-making factors for a DCO application, the 'consenting' subtheme identifies certain more specific or narrower criteria, such as the extent of land required within the DCO Order Limits in due course, local planning policy spatial allocations, or requirements for other consents/licenses.

2.7.3 A summary of appraisal step 6, including the workshop and appraisal outcome, is presented in Section 6 of this report for the SESRO main access road. The summary for the Steventon to East Hanney road diversion is presented in Section 10. The key theme and subtheme narratives presented in these report sections are intended to summarise the key points from assessment narratives, present the issues that provided differentiators between options and provide a preferred option with a reasoned justification.

2.7.4 It should be noted that the options appraisals have referred, where appropriate, to interactions with potential future developments identified through the Vale of White Horse (VoWH) Local Plan 2031[2] and the emerging South Oxfordshire and VoWH draft Local Plan 2041[3], which include possible road bypasses of Marcham and Abingdon, a possible passenger rail station for Grove and Wantage, and a possible Flood Storage Area west of Abingdon. Due to the relatively long timescale for potential SESRO development, it has been felt important to give consideration to interaction with these other possible future infrastructure developments. However, only limited weight has been given to this in the appraisal due to uncertainty over the status of such possible developments, which would be dependent on other parties (such as Oxfordshire County Council or the Environment Agency) and for which there are at the time of writing no firm development proposals or timescales.

2.8 Appraisal Steps 7 and 8: Review Against Other SESRO Appraisals, and Master planning and Consultation

2.8.1 Appraisal steps 7 and 8 are not reported within this options appraisal report, but rather they are being undertaken as part of the Gate 3 Interim Landscape and

[2] VoWH District Council, Local Plan 2031. Available online: https://www.whitehorsedc.gov.uk/vale-of-white-horse-district-council/planning-and-development/local-plan-and-planning-policies/local-plan-2031/

[3] South Oxfordshire and VoWH District Councils, Draft Joint Local Plan for South and Vale 2041 Regulation 18 (January 2024). Available online: https://theconversation.southandvale.gov.uk/jlp/

Environmental Master Plan development, as set out in the SESRO Options Appraisal Context and Methodology Report.

3 SESRO Main Access Road: Constraints on Option Definition

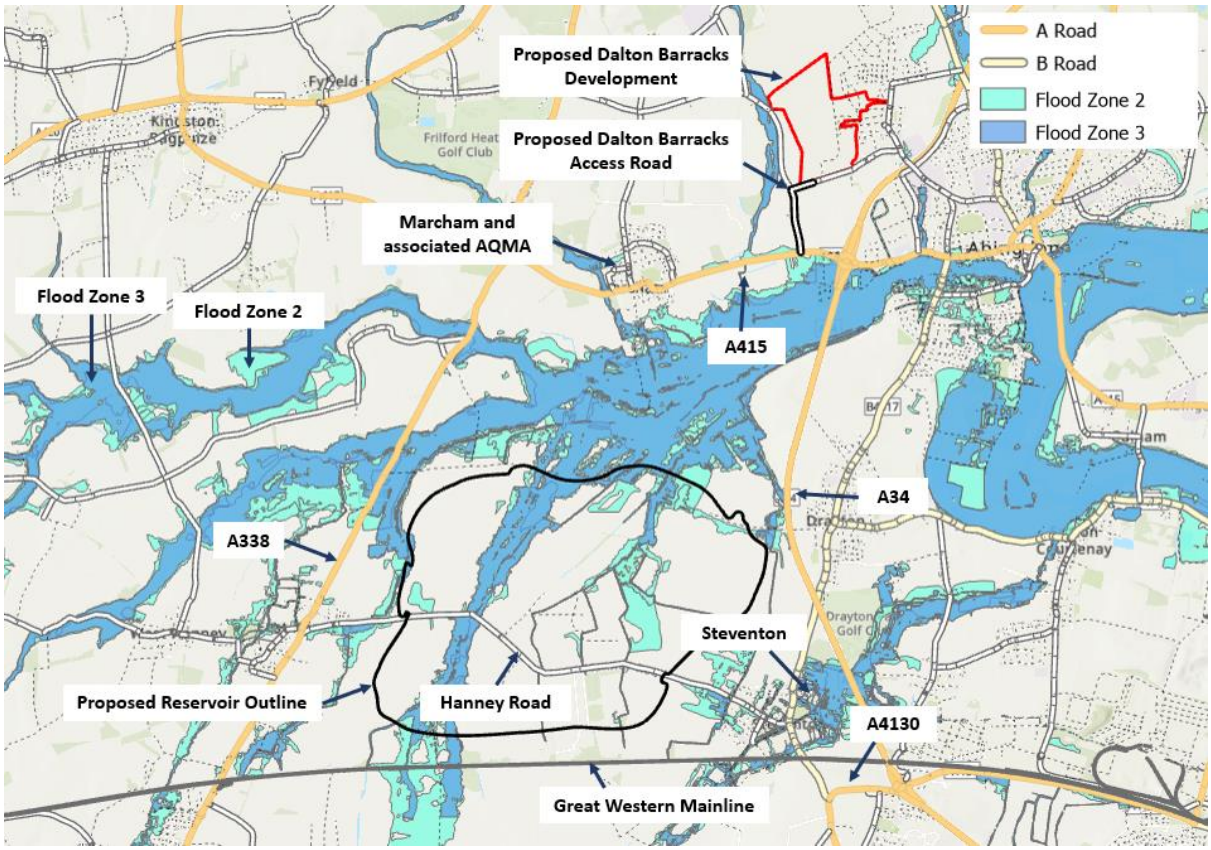
This section defines the constraints on option definition for the SESRO main access road in accordance with step 2 of the appraisal methodology.

3.1 Topographic Constraints

3.1.1 The SESRO site is bounded by the A34 to the east, the River Ock and A415 to the north, the A338 to the west and the Great Western railway to the south. The A34 is a dual carriageway trunk road and the A415 and A338 are single lane A-Roads that pass through the villages of Marcham, Frilford and East Hanney. Of these roads only the A34 is part of the strategic road network.

3.1.2 An indirect constraint is the River Ock and its floodplain, see flood zones 2 and 3 on Figure 3.1. There is a need to ensure that the access road is designed so that it is above the flood level, to ensure that access can be maintained during a flood, and that impact on river quality is avoided, and to minimise adverse impact on flooding due to the presence of the access road. Furthermore, the volume of flooding displaced by the access road must be accounted for within the replacement flood storage volume.

Figure 3.1: Constraints on access road development in the proposed reservoir area



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3.2 Highway Constraints

3.2.1 A main access road is needed for SESRO to provide road access for construction, operation and maintenance activities, and recreational visitors to the reservoir. Construction materials, construction and operational staff, and visitors will travel to the site from outside the local area. To minimise impacts on the local road network, connection to a road in close proximity to the strategic road network is preferable. Since the A34 is the only strategic road in the locality of SESRO, it is considered to be the most appropriate vehicle access route to minimise impact on the local road network.

3.2.2 The alignment of the access road to the SESRO reservoir site directly from the strategic road network is strongly constrained by National Highways policy against connections on sections of the road network designed for high-speed traffic. As such, a permanent direct access to the SESRO reservoir site from the A34 is considered unlikely to be an acceptable option. This is set out within paragraph 20 of the Department for Transport's circular titled Strategic road network and the delivery of sustainable development[4] from December 2022.

3.2.3 There may be an opportunity to create a temporary access road (for construction only) from an existing lay-by on the A34 located close to the proposed SESRO site. However, early discussions with National Highways indicate that this is unlikely to be an acceptable option due to the same policy described in 3.2.1; therefore, neither a permanent or temporary junction with the A34 is considered when defining options for a SESRO access road.

3.2.4 An access to the site which uses the Milton Interchange junction of the A34 and the A4130 has not been considered because this would require construction traffic to pass through Steventon and over the Great Western Mainline.

3.2.5 As a result of the constraints and issues above, the A34 Marcham Interchange with the A415 been identified as the preferred access route to SESRO, and the A415 as the suitable road on which to create a junction that can provide access to the SESRO reservoir site. Taking into consideration the Air Quality Management Area (AQMA) and restricted road geometry in Marcham; any junction should be located to the east of Marcham, between Marcham and the A34 Marcham Interchange. Initial discussions have taken place with OCC and VoWH District Council during Gate 1 and 2 and no objections were raised during these discussions.

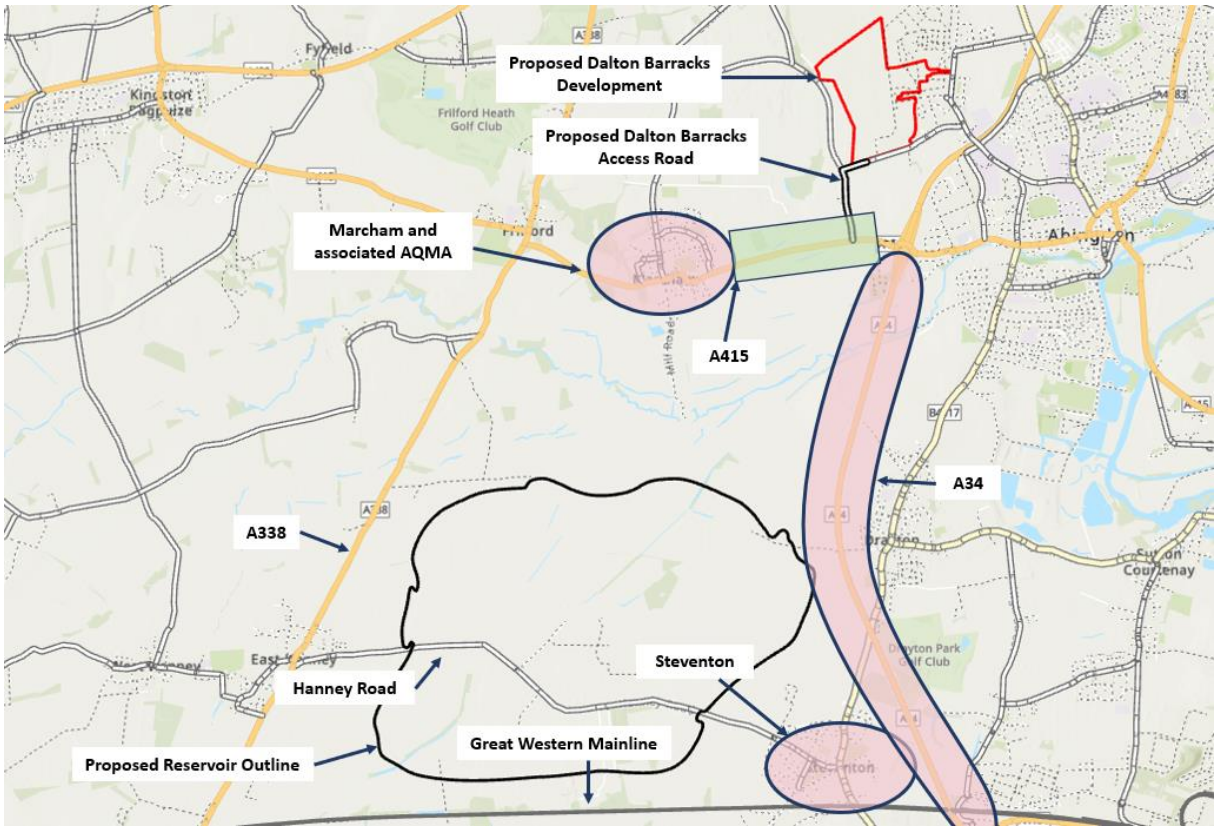
3.2.6 In addition, proximity to a junction on the A34 should be considered, to ensure the reservoir site access road prevents or minimises adverse queuing or delay impacts on the surrounding strategic road network.

3.2.7 Therefore, for the assessment of options for an access road to the SESRO site, the starting point of all road options is the A415 for both temporary

[4] Department for Transport, Policy Paper: Strategic road network and the delivery of sustainable development (December 2022). Available online: https://www.gov.uk/government/publications/strategic-road-network-and-the-delivery-of-sustainable-development/strategic-road-network-and-the-delivery-of-sustainable-development https://www.gov.uk/government/publications/strategic-road-network-and-the-delivery-of-sustainable-development/strategic-road-network-and-the-delivery-of-sustainable-development

(construction) and permanent access, as shown schematically in the figure below.

Figure 3.2: Schematic showing highway constraints



Source: Esri, Intermap, NASA, NGA, USGS | Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

3.3 SESRO and External Scheme Constraints and Opportunities

3.3.1 A facility to enable the rapid drain down of the reservoir will be required. One option for providing this facility is an Auxiliary Drawdown Channel (ADC). An ADC alignment was identified in the Indicative Gate 2 Master Plan, but the requirement for and route of the ADC is subject to a separate option appraisal and could change. This means that a reservoir access road may need to cross the alignment of the ADC. This appraisal has been undertaken assuming that the SESRO project includes the ADC as in the Indicative Gate 2 Master Plan. When the options appraisal of the main access road is backchecked subsequently (refer to Section 1.3 for further details), assumptions associated with the Indicative Gate 2 Master Plan will be reviewed.

3.3.2 The following external schemes were identified for consideration when defining and/or assessing the options for the SESRO main access road:

- South Abingdon-on-Thames Bypass (also known as the Southern Abingdon Movement Corridor): In the VoWH Local Plan 2031 Part 2 (LPP2)[5], there are plans to develop a South Abingdon-on-Thames Bypass to alleviate traffic within Abingdon, with some options connecting from the A415 and heading south. Depending on timing, any such future scheme could provide an opportunity to work in partnership with the OCC and/or may create combined impacts that need consideration. In the consultation draft VoWH and South Oxfordshire Joint Local Plan 2041[6] the safeguarded area is proposed to be revised and the future proposal is described as a 'Movement Corridor' rather than bypass, which is understood from discussion with Oxfordshire County Council to reflect potential for transport options other than a road bypass.
- Dalton Barracks Development: The proposed nearby Dalton Barracks residential development site also provides a constraint, as it will require a new roundabout with the A415 Marcham Road, so a new access road that connects on to the A415 must take this into consideration. Refer to Figure 3.1. The scheme has a Supplementary Planning Document (SPD) and an allocation for 1,200 houses in the Local Plan. The VoWH's 2022 5-year land supply statement contains a forecast of Dalton Barracks being built during 2031-2039[7], but there is also a suggestion of phasing it by constructing 50 houses starting in 2026[8].
- South Marcham Bypass (also known as the Marcham Movement Corridor): The VoWH Local Plan 2031 Part 2 (LPP2)[9], adopted in 2019, includes a safeguarded area for the potential construction of a South Marcham Bypass and improvements to Frilford Lights. Depending on timing, any such future scheme could provide an opportunity to work in partnership with the OCC and/or may create combined impacts that need consideration. This provides a constraint, as it would require a new roundabout with the A415 Marcham Road, so a new access road that connects on to the A415 should take the future possibility of this into consideration.

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[5] VoWH District Council, *Local Plan 2031 Part 2 Detailed Policies and Additional Sites* (October 2019), page 40. Available online: https://www.whitehorsedc.gov.uk/wp-content/uploads/sites/3/2021/03/VOWHDC-Master-1.pdf

[6] VoWH and South Oxfordshire District Councils, Joint Local Plan 2041 – Preferred Options Consultation (Regulation 18 Part 2), January 2024.

[7] VoWH District Council, *Housing Land Supply Statement for the Vale of White Horse* (November 2022), page 38. Available online: https://www.whitehorsedc.gov.uk/wp-content/uploads/sites/3/2022/11/2022-11-11-Vale-5YHLS-Statement.pdf

[8] VoWH District Council, *Housing Land Supply Statement for the Vale of White Horse* (November 2022), page 54. Available online: https://www.whitehorsedc.gov.uk/wp-content/uploads/sites/3/2022/11/2022-11-11-Vale-5YHLS-Statement.pdf

[9] VoWH District Council, *Local Plan 2031 Part 2 Detailed Policies and Additional Sites* (October 2019), page 40. Available online: https://www.whitehorsedc.gov.uk/wp-content/uploads/sites/3/2021/03/VOWHDC-Master-1.pdf

- Abingdon Flood Alleviation Scheme: The Environment Agency has previously carried out a feasibility study for construction of a flood alleviation scheme for Abingdon, located to the west of Abingdon and south of the A415 and Marcham so in vicinity of the SESRO access road options. It was proposed that a flood embankment could be constructed across the River Ock upstream of the A34. The embankment would run from north to south to form a Flood Storage Reservoir (FSR) which would fill during flood events by holding back a proportion of the flood flow in the river. During its operation, flows from the FSR would be released at a rate which would not exceed the capacity of the river channel as it passes through Abingdon. Some of the road alignment options may be able to facilitate the FSR for Abingdon, as discussed in the option descriptions.

3.3.3 Given there are several possible future schemes potentially connecting to the A415 between Marcham and the Marcham Interchange, consideration was given in the development of options to whether there is an opportunity to minimise the number of potential new roundabouts on this road stretch by aligning with the other schemes and in so doing rationalising the number of junctions that might be introduced along that road.

4 SESRO Main Access Road: Options Definition

This section presents the options developed for the SESRO main access road for assessment in accordance with step 4 in the appraisal methodology.

4.1 Development of Options for the SESRO Main Access Road

4.1.1 The development of options for the SESRO main access road is described below by setting out the start and end of the road, and then the identification of alignment options between.

Start Point of the SESRO Main Access Road

4.1.2 Due to the highway constraints detailed in section 3.2, the stretch of the A415 running north of the SESRO site between Marcham and the A34 was identified as the stretch of road from which the SESRO main access road should start. This road stretch is shown in Figure 4.1.

4.1.3 There are many options along this stretch of the A415 for the positioning of the junction to start the SESRO main access road; therefore, consideration was given to the external schemes (identified in section 3.3) to formulate a number of representative options for assessment. Detail is provided on the identification of junction locations in the later sections, which describe the road alignment options defined for appraisal. Following assessment, minor adjustments are likely as the design develops to determine an optimum road alignment for the SESRO project. In this case backchecking will be carried out as noted in Section 1.3.

End Point of the SESRO Main Access Road

4.1.4 To fulfil the requirements to provide construction and operational access (as set out in paragraph 1.2.1), the SESRO main access road needs to provide access for a range of vehicle types up to the crest of the reservoir embankment. For definition of the options for appraisal, the Indicative Gate 2 Master Plan was used as the basis to identify the end point of the SESRO main access road.

4.1.5 All options defined for the SESRO main access road follow the same alignment once in the vicinity of the pumping station location[10] and then up on to the embankment to the reservoir crest.

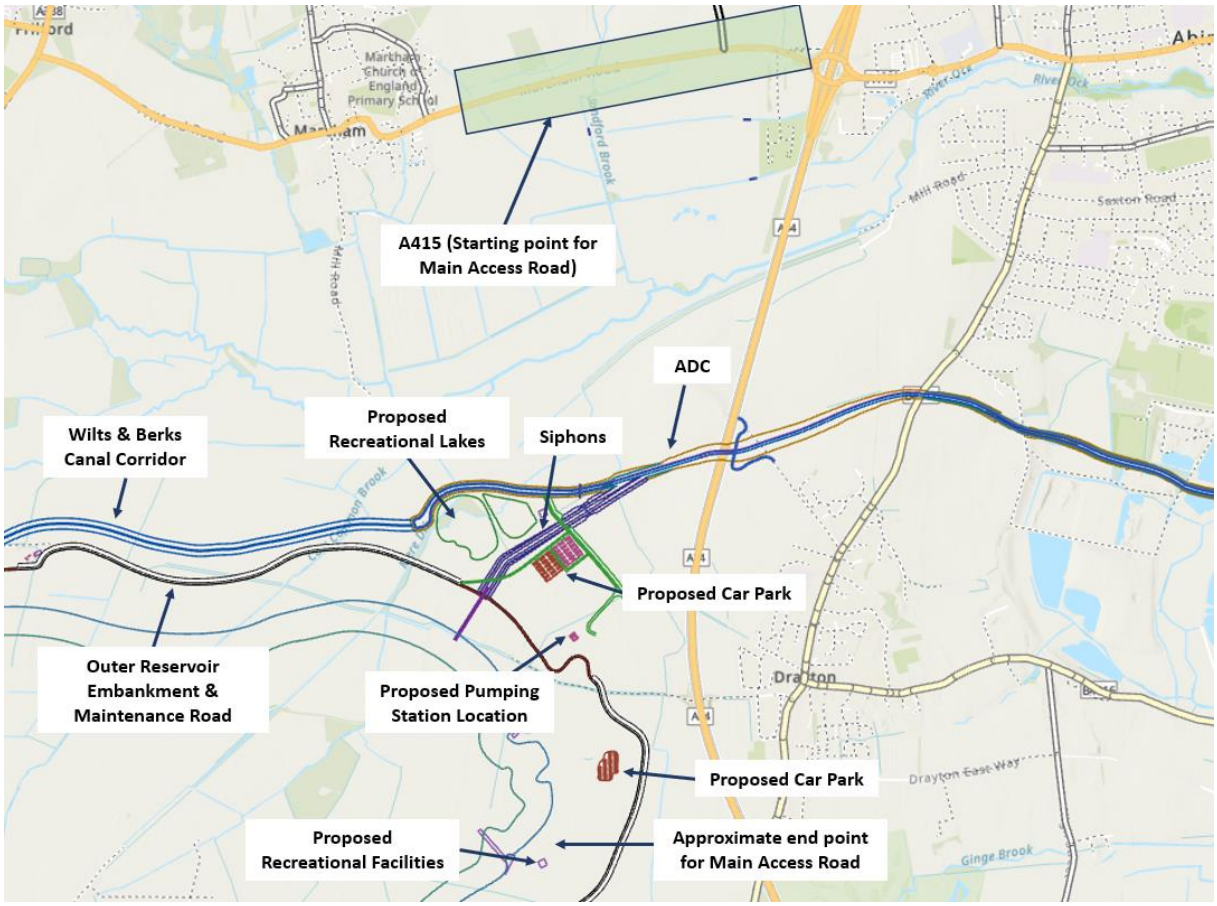
4.1.6 Localised operational area roads near the northeast corner of the reservoir embankment in the Indicative Gate 2 Master Plan provide access to maintain the operational infrastructure, such as the pumping station, potential ADC, recreational lakes (also used as settlement ponds during construction), siphons and the siphon channel, which are all required for the operation of the reservoir. The operational infrastructure is shown on Figure 4.1 as set out in the Indicative

[10] As detailed in the SESRO Option Appraisal Context and Methodology Report, the pumping station is located near the northeast corner of the reservoir embankment due to its relationship with other SESRO assets and the geological constraints of the area. For further details, refer to the SESRO Option Appraisal Context and Methodology Report.

Gate 2 Master Plan. The northeast corner of the reservoir site was also identified during Gate 2 master planning as being suitable for recreational facilities, potentially including a café and sailing club.

4.1.7 It should be noted that the development of the master plan is an iterative process, as set out in the SESRO design development process shown in Figure 1.1. The Indicative Gate 2 Master Plan has been used as a basis for the options appraisals undertaken at this time, with the outcomes of the appraisals feeding back into the development of the Gate 3 Interim Landscape and Environmental Master Plan. When the options appraisal of the main access road is backchecked subsequently (refer to Section 1.3 for further details), assumptions associated with the Indicative Gate 2 Master Plan will be reviewed.

Figure 4.1: SESRO Main Access Road – Considerations for Road Start and End Points



Source: Esri, Intermap, NASA, NGA, USGS | Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

Note: Ancillary items not related to the road are indicative based on Gate 2 proposals, including the ADC, siphons, car parking and pumping station.

Routing of Options for the SESRO Main Access Road

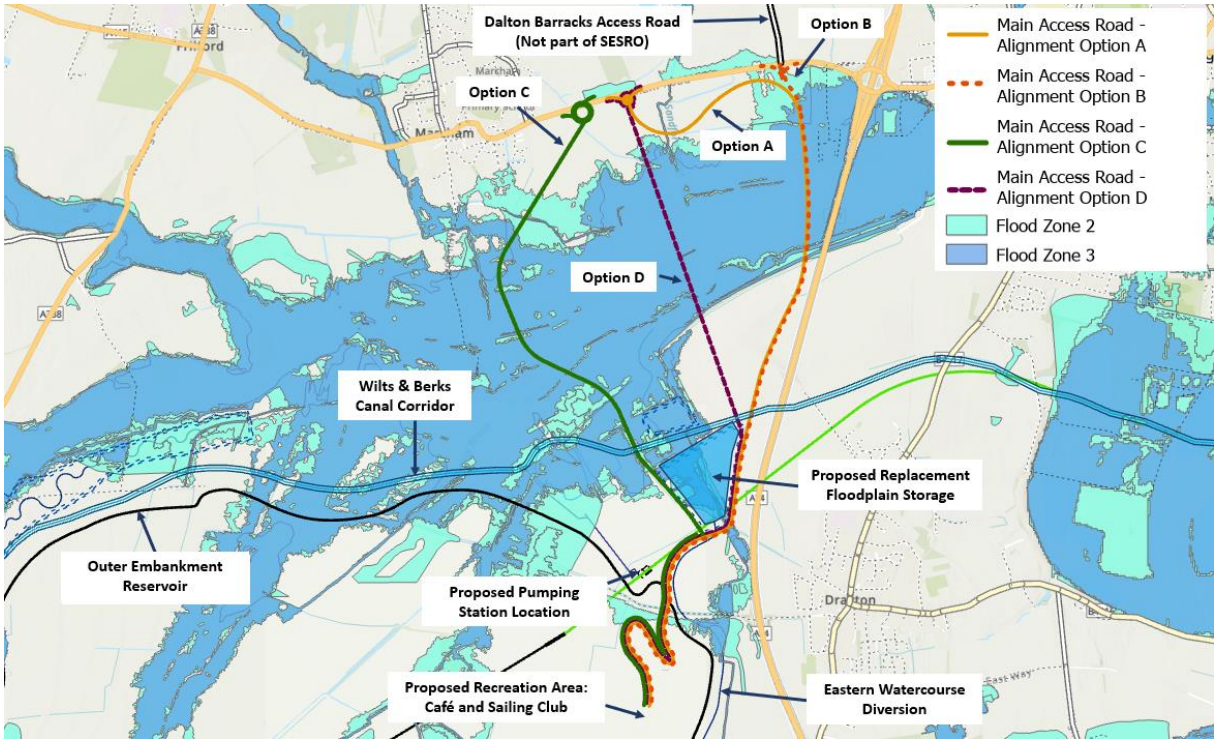
4.1.8 Options for the alignment of the SESRO main access road were therefore routed from the identified stretch of the A415 north of the reservoir up to the crest of the reservoir embankment in the northeast corner of site, aligning past the pumping station location.

4.1.9 There were four alignment options identified for appraisal, which are shown in Figure 4.2. Options A, B and C were considered previously at Gate 2 and all three were brought forward for further consideration and assessment during the Gate 3 options appraisal.

4.1.10 The appraisal process for the four alignment options in Figure 4.2 is reported in this report, working towards the Gate 3 submission. It should be noted that the ancillary works shown in Figure 4.2 are from the Indicative Gate 2 Master Plan and are therefore subject to change as the SESRO design is progressed through Gate 3.

4.1.11 The following sections define the four alignment options, as well as set out how each alignment was identified from the stretch of the A415 to the area vicinity of the pumping station location.

Figure 4.2: SESRO Main Access Road - Road Alignment Options



Source: Esri, Intermap, NASA, NGA, USGS | Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS; Contains public sector information licensed under the Open Government Licence v3.24

Note: Ancillary items not related to the road are indicative based on Gate 2 proposals, including the ADC, siphons, car parking and pumping station.

Alignment Option A

4.1.12 Option A was developed with the possibility for the road embankment to also be used as a flood alleviation scheme (outlined in section 3.3). The SESRO Gate 2[11] submission to RAPID highlighted this as an opportunity and the supporting Concept Design Report (CDR) stated the following:

"The Environment Agency has previously carried out a feasibility study for construction of a flood alleviation scheme for Abingdon. This included a flood embankment constructed across the River Ock upstream (east) of the A34, to impound a Flood Storage Reservoir (FSR) which would fill during floods by holding back a proportion of the flood flow and thereby reduce flooding in Abingdon. The Abingdon Flood Alleviation Scheme has not progressed to construction, however the Environment Agency continues to consider options for flood mitigation in this area.

The proposed A415 to SESRO access road would be built on an embankment along a similar alignment as the flood embankment previously considered by the Environment Agency study. Therefore, there is an opportunity for one embankment to provide both access to the SESRO site and flood storage. While this dual-purpose functionality has not been incorporated into the current conceptual design, flood modelling has been undertaken to investigate the opportunity and to help inform future discussions with the Environment Agency."

4.1.13 Option A connects to the A415 with a roundabout junction approximately 1.2km west of the Marcham Interchange (A415/A34) and to the east of the village of Marcham outside of the AQMA. The road option is approximately 5.12km long and initially routes east (parallel to the A415) and then south (parallel to the A34) to reach the reservoir crest.

Alignment Option B

4.1.14 Option B is largely the same as Option A but the junction on the A415 is located approximately 440m west of the Marcham Interchange (A415/A34), so the total length of Option B is approximately 4.27km, which is shorter than Option A.

4.1.15 The roundabout junction for Option B was located to align with an existing unnamed road, which leads to Gozzards Ford (via Farringdon Road), because this unnamed road is likely to be used for access to the proposed housing development at Dalton Barracks[12] so the roundabout may be able to serve both SESRO and Dalton Barracks.

Alignment Option C

4.1.16 Option C was included in the options appraisal to consider whether the SESRO main access road could connect to the A415 (Marcham Road) via the eastern section of a possible future South Marcham Bypass, which would account for 1km of the proposed route. Figure 4.3 shows how this may be achieved.

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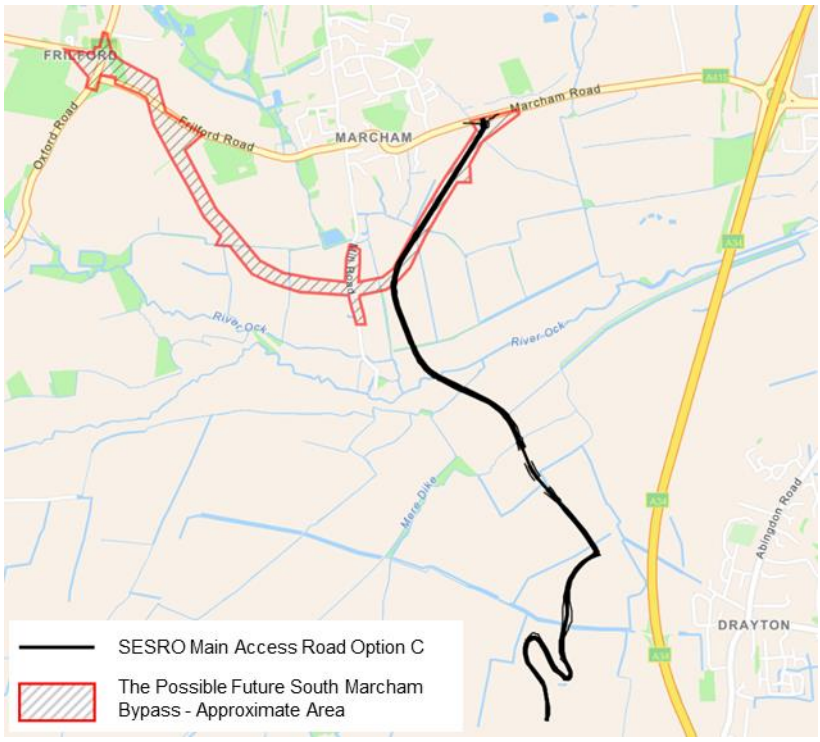
[11] Gate 2 Submission: New reservoir in Abingdon | Water resources | Thames Water

[12] VoWH District Council, *Dalton Barracks Supplementary Planning Document* (April 2022). Available online: https://www.whitehorsedc.gov.uk/vale-of-white-horse-district-council/planning-and-development/local-plan-and-planning-policies/supplementary-planning-documents/dalton-barracks-supplementary-planning-document/

4.1.17 Option C is approximately 4.41km, including a section of the possible future South Marcham Bypass.

Figure 4.3: South Marcham Bypass and Option C



Source: Source: Esri, Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and affiliates Esri Community Maps contributors. Map player by Esri

Alignment Option D

4.1.18 Option D is the most direct alignment from the A415 to the reservoir. Option D is approximately 4.05km long and uses the same junction location as Option A.

4.2 Design Information for Option Assessments

4.2.1 Information was developed for the four alignment options on which to base the option assessments.

Common Design Aspects across the Alignment Options

4.2.2 There are common design aspects across the alignment options for the SESRO main access road. These form the basis for the development of the options and the assessments undertaken and incorporate the best available information at the time of assessment. In many cases, this has resulted in the use of Gate 2 information[13]. Any significant future change in this information will trigger a back check of the assessments – as detailed in Section 1.3.

4.2.3 For all options, the main access road to the SESRO reservoir site was assessed

[13] The Gate 2 submission for SESRO is available online at: https://www.thameswater.co.uk/about-us/regulation/strategic-water-resource-solutions/new-reservoir-in-abingdon . The Gate 2 SESRO Concept Design Report is available online at: A-1: SESRO Concept Design Report (thameswater.co.uk)

as a rural two-lane carriageway with a width of 7.3m and speed limit of 30mph. This is based on the current assumptions for visitor numbers and expected usage profile due to the visitor number. It has been proposed that an approximately 3m wide shared cycle path / footpath would be provided on both the east and west sides of the road. The provision of shared usage routes is provided to ensure suitable sustainable transport connections are created to connect to the SESRO network of footpath and cycleways in line with National Policy Statement for Water Resources Infrastructure, paragraph 4.14.7 and 4.14.9 that requires behaviour change and modal shift through provision of mode choices to mitigate transport effects.

4.2.4 It is assumed that the roads are not lit along the alignment, except for the junctions and leading up to and out of the roundabouts. Due to the 50mph speed limit, it is assumed that along the A415, leading into and out of the roundabout, there would need to be approximately 110m of lighting, possibly up to 250m for Option B to provide continuous lighting between the roundabout and the A34. Due to the 30mph speed limit, it is assumed that along the SESRO main access road, approaching the roundabout, there would need to be approximately 65m of lighting. Lighting will be considered at subsequent design phases to meet OCC standards and in balance with environmental considerations. Proposed lighting will be assessed during construction and operational phases as part of the Environmental Impact Assessment (EIA) process and the preliminary findings of the assessment will be consulted on.

4.2.5 For all options, the road would be raised above the River Ock floodplain[14] on an embankment and would require bridges to cross over the River Ock, the potential ADC, if located in this area, the eastern watercourse diversion and Sandford Brook. Bridges or culverts would also be required for the road to pass over smaller watercourses.

Key Option Differences - Number of Watercourse Crossings

4.2.6 The number of crossings for each option have been counted using ArcGIS to identify where the road alignment options pass over existing and proposed watercourses. The number of watercourse crossings for each option are presented in Table 4.1.

Table 4.1: SESRO Main Access Road Options – Number of Watercourse Crossings

Alignment Option	Total Number of Crossings	Likely Number of Bridge Crossings
A	8	4
B	7	3
C	11	3
D	7	3

[14] Water levels were taken from fluvial flood modelling of the 1 in 100-year return period flood event (+70% to account for climate change).

Source: Thames Water Internal, 2024

4.2.7 Where a crossing is expected to span a considerable distance or over a Water Framework Directive (WFD) principal waterbody it is assumed that a bridge will be needed, for example to cross the River Ock, the eastern watercourse diversion, the potential ADC and Sandford Brook, with culverts on all other crossings. Option C requires the most crossings, due to its length and because its alignment crosses the most watercourses. Figures showing the locations of the anticipated crossings for each option can be seen in Appendix I.

Key Option Differences - Earthworks Quantities

4.2.8 The indicative earthworks fill volumes in Table 4.2 were informed by initial design development work to prepare for the options appraisal, which ensures that the road surface level is above the flood level of the River Ock. It is assumed that the fill volume required for the roads shall be sourced from within the SESRO site.

Table 4.2: SESRO Main Access Road Options - Earthworks Quantities

Alignment Option	Total Road Length (km)	Indicative Earthworks Fill volume (m^3)	Fill volume per metre (m^3/m)
A	5.12	102,400	20.0
B	4.27	92,500	21.7
C	4.41	110,600	25.1
D	4.05	91,100	22.5

Source: Thames Water Internal, 2024

4.2.9 Where the road options cross watercourses, water levels were taken from fluvial flood modelling of the 1 in 100year return period flood event (+70% to allow for climate change). The level of the road was set 1.3m above this water level to allow for an assumed 1m thickness of the bridge deck plus a 0.3m freeboard between the water level and the underside of the bridge.

4.2.10 Option C requires the greatest fill volume per metre length, this is due to the greater number of crossings required for this the option, as each crossing requires fill to enable the road to slope up to, and down from, the crossing to provide the clearance required. It should be noted that for Options A and B the volume of earthworks would need to be greater if the options were to support the potential FSR for Abingdon (outlined in Section 3.3).

5 SESRO Main Access Road: Option Assessments

This section summarises the option assessments undertaken for the SESRO main access road in accordance with step 5 of the appraisal methodology. The section starts by outlining the assumptions taken in the assessments, before individually summarising the performance of each alignment option when assessed.

5.1 Assessment Assumptions

5.1.1 This section sets out the assumptions used in the assessment of road alignment options, future changes in assumptions should be reviewed for any potential effect on the outcome of the options appraisal. Section 1.3 earlier in this report outlines the backchecking planned for the options appraisals work.

Engineering Assessment Assumptions

5.1.2 The engineering assessment was considered in two themes: Construction and Operation. The following assumptions informed the assessment:

- The section of the road which leads to the crest of the reservoir is the same for all options. It is assumed that the northeast corner of the reservoir crest would be suitable for recreational facilities, including a café and sailing club, as determined at Gate 2.
- For the assessment of the access road options it has been assumed that crossings of existing watercourses shall be accomplished via culverts, unless the crossing must go over a large watercourse or principal WFD waterbody, such as the River Ock, ADC, East Watercourse Diversion or Sandford Brook, in which case a bridge would be required.
- There are watercourse diversions to the east and west of the SESRO site to pick up the flows of existing watercourse systems in the area that already broadly flow west and east. It is assumed that the eastern watercourse diversion and western watercourse diversion around the SESRO site are as per the Gate 2 alignment.
- For the access road assessment, it has been assumed that the reservoir will require an ADC for emergency discharge, although this is to be determined in a separate appraisal to be undertaken in parallel to this study. As such, within the assessment all access road options consider crossing of the ADC. Following completion of appraisals for associated infrastructure, assumptions made for each appraisal will be reviewed and updated according to the revised master plan.
- In some cases, alignments are routed to cross over proposed watercourse diversions. In these instances, although it may be possible to re-route the watercourses to avoid the need for a crossing with the road options, the watercourse route is assumed to be as per the Gate 2 alignment.

- The Design Manual for Roads and Bridges[15], a UK design standard widely adopted by local councils as standards for their highways, was used to determine the embankment and longitudinal gradients of the access road options. Concept design work was undertaken to establish the volume required for earthwork embankments, using LiDAR data downloaded from Defra[16].
- For each road option, the number of utilities impacted upon was identified considering utility information obtained in April 2022 for 11kV, 33kV and 132kV overhead electricity lines, intermediate pressure gas pipelines and a potable water trunk main. It has been assumed that diversion of these utilities can be undertaken. Initial discussions regarding electricity diversions have been undertaken with the Distribution Network Operator (DNO), but detailed discussions will need to be held as any electricity diversion designs are developed. Discussions will also be undertaken with the providers for the other affected utilities.

Cost and Carbon Assessment Assumptions

5.1.3 Capital cost and carbon for each option were derived using the approach outlined in the Gate 2 reports. Some aspects of the cost and carbon build-ups needed to be updated or added. Quantities were estimated to reflect the differences between options. Where available, benchmarked unit cost rates from Gate 2 were used, and where these were not available new rates were developed. Emissions factor rates were identified for key items from Civil Engineering Standard Method of Measurement (CESMM4).

Environmental Assessment Assumptions

5.1.4 A range of environmental issues were considered individually. The following assumptions informed the assessment:

5.1.5 Biodiversity and Nature Conservation

- It was assumed that the Ancient Woodland Inventory and Ancient Tree Inventory was correct and comprehensive at the time of the optioneering process (summer 2023). The latter will need to be confirmed once land access is available and surveys can be carried out to confirm the desktop data.
- The assessment of habitats to be impacted was undertaken using aerial imagery and UK Habitat information collected in advance of Gate 2, the latter of which was collected using desk study information and aerial imagery and has not been fully ground truthed.

[15] The Design Manual for Roads and Bridges (DMRB) is available online at: https://www.standardsforhighways.co.uk/dmrb

[16] Defra Survey Data Download is available online at: https://environment.data.gov.uk/survey

- There will be no direct or indirect impacts to The Cuttings and Hutchin's Copse LWS as a result of the road's construction as the access road is over 3km from the LWS.
- Existing gaps and access points within landscape features will be used where feasible to minimise vegetation clearance.

5.1.6 Historic Environment

- The existing publicly available data regarding buried archaeology is not complete and is subject to further desk study and non-intrusive and intrusive surveys to understand the presence, extent and value of buried remains.

5.1.7 Land Quality

- Data provided by third parties, including historical maps, to undertake these assessments are accurate.

5.1.8 Landscape and Visual

- Some lighting would be required during construction for early morning and evening/night-time working during the winter, most likely at the junction with the A415.
- That minimum permanent lighting (as set out in section 4.2) would be required for the operational road, most likely at the junction with the A415.
- That similar mitigation seeding and planting to that proposed for the Gate 2 design could be implemented for all options.

5.1.9 Noise

- Noise emissions for construction activities (including construction traffic movements and main construction plant / numbers) are based on the assumptions reported at Gate 2[17], with updates made following a review by the SESRO construction advisor as required.
- Property counts do not consider the screening of receptors by nearby buildings (i.e., noise screening for the second row of properties is not considered due to the presence of the first row of properties).

5.1.10 Aquatic Environment

- On each of the crossings of the principal WFD watercourses we assume the use of clear span bridges to reduce potential impacts. On each of the other crossings it is assumed that appropriately sized box culverts are used.

[17]Thames Water and Affinity Water, *SESRO Technical Supporting Document B2: Terrestrial Environmental Appraisal Report* (2022). Available online: 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

Community, Planning and Land Assessment Assumptions

5.1.11 The assessment assumptions with regard to the road design and alignment are as set out in the engineering section, above.

5.1.12 All Public Rights of Way (PRoW) severed by the development will be re-routed / reinstated.

5.1.13 An area of uncertainty is the interaction of the road options with potential future plans, noted in local policy, including the possible future South Abingdon-on-Thames Bypass and South Marcham Bypass, as well as Environment Agency plans for potential future flood defences and storage east of Marcham. For the purpose of the appraisal of this theme, these interactions have been noted but it has not been assumed that the SESRO access road options conflict with the possibilities of future bypass and flood defence developments since, in some cases, they could form part of delivering those schemes (should they come forward).

5.1.14 All property and land assessments have been undertaken from a desktop review and data should be confirmed where necessary through land access and surveys, when and where possible.

5.1.15 During the property and land assessments, assets have been categorised based on clusters. For example, based on desktop studies involving publicly available information, including visual inspection and mapping resources, it may be assumed that a single business operates from multiple buildings. However, it is recognised that this must be confirmed when it is possible to contact relevant stakeholders.

5.2 Alignment Option A

5.2.1 This section summarises the performance of Option A considering the appraisal themes and subthemes. For full details of the assessment of Option A against individual criteria, refer to Appendix A. The alignment of Option A is shown in Figure 4.2.

Engineering (Constructability) Performance

5.2.2 Option A requires eight crossings and requires 1.7km of 132kV HV Overhead diversions and a gas diversion over the ADC (subject to identification of its final location). From a health and safety perspective, these would increase the risk of endangering workers and require enhanced measures.

5.2.3 For Option A, disruption to the existing road network during enabling works and construction is judged likely to be moderate because construction material will be delivered to site by road, but the rate of deliveries is expected to be below 20HGVs per day, assuming reservoir materials are brought in via train.

5.2.4 With regards to the subthemes of programme, logistics and construction complexity, Option A has length of 5.1km and an estimated 102,400m^3 of fill. It has an alignment close to the A34, which brings in the opportunity for the access road bridge across the ADC to also be used for the gas diversion and help facilitate the construction of the ADC box culvert (that enables the A34 to

cross the ADC). If construction access can be temporarily provided from the A34 layby, then construction traffic can be allowed from both ends of the road. In addition to this, for Option A, the alignment provides an opportunity to reduce the construction programme associated with the gas diversion and the ADC box culvert. Furthermore, Option A has adequate space on the west side which could be used for construction compounds and replacement flood storage. The number of vehicle movements will be related to the length and earthworks required. Access to construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.

Engineering (Operability) Performance

5.2.5 The health and safety criteria during operation considers the risk of endangering operational staff, visitors or members of the public, and also whether access/egress can be provided during normal operations and emergencies. Option A performs well since the road design follows best practice regarding elements such as the speed limit, bend radii, gradients and drainage.

5.2.6 Option A performs well against the operational complexity criterion because it is judged that the majority of maintenance activities could be undertaken during limited closure periods and/or with limited disruption.

5.2.7 Option A performs well for operational resilience because it can accommodate both the possible future South Abingdon-on-Thames Bypass and the Abingdon Flood Alleviation Scheme so is adaptable in that it offers the opportunity for dual functions and offers flexibility for future modifications. Considering its operational reliability, there are measures identified for Option A to reduce the impact of the main access road being out of operation and although Option A is partially within flood zones 2 and 3, it would be designed to withstand predicted flooding so the risk of flood damage is not considered significant.

5.2.8 From a transport planning perspective, the potential third party impact of Option A is likely to be manageable. Disruption to the existing road network during the operation of Option A is likely to be limited with the junction location set back from the A34 to decrease the potential impact on traffic flows. Initial traffic modelling of the junction suggests that the capacity at the junction for Option A would reduce over time but that this can likely be managed.

Cost and Carbon Performance

5.2.9 Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 0.4% of the total SESRO costs. Option A results in a total project cost of 0.3% more than the lowest cost option.

5.2.10 Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option A results in a total project carbon of 0.5% more than the lowest carbon option.

5.2.11 Option A provides an opportunity for cost-sharing with the possible future South Abingdon-on-Thames Bypass and/or the Abingdon Flood Alleviation Scheme.

Environmental Performance

5.2.12 Considering potential impacts associated with air quality, Marcham AQMA is approximately 400m west of the access point for Option A and there are a number of nearby sensitive receptors, which have the potential to be affected by construction dust, although this could be managed through standard construction dust management practice such as a defined construction HGV routes to avoid or minimise impacts on the Marcham AQMA.

5.2.13 For the aquatic environment subtheme, Option A has no interactions with sensitive groundwater source protection zones (SPZ). There is also no risk identified of WFD deterioration associated with Option A but there are moderate adverse effects predicted for Option A on the aquatic environment due to the main River Ock crossing and multiple crossings within the Sandford Brook WFD waterbody, including two crossings of the Sandford Brook WFD principal watercourse. Any impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately.

5.2.14 There is one crossing and potential for minor interactions with the course of the eastern watercourse diversion shown in the Gate 2 Indicative Master Plan, which flows through quite a narrow corridor to the east of the site, however any potential impacts could be mitigated by sensitive design.

5.2.15 Option A performs well against much of the biodiversity and nature conservation criteria as none of the following designated sites were identified within the boundary, or in proximity to, Option A: Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site, Sites of Special Scientific Interest (SSSI), National Nature Reserve (NNR) and Local Nature Reserve (LNR). However, priority habitats, such as floodplain grazing marsh, deciduous woodland and hedgerows will require removal for the construction of Option A. Desk study of Natural England's Ancient Woodland Inventory and historical maps indicates that no ancient woodland (considered to be irreplaceable habitat) would be affected. Desk study of the Woodland Trust's Ancient Tree Inventory indicates that no ancient or veteran trees (also considered to be irreplaceable habitat) are located close to Option A; however, survey may potentially identify trees that could be classified as ancient or veteran trees.

5.2.16 While the construction of Option A may require the removal of vegetation belts including a limited section of a woodland belt, Option A performs well for biodiversity and nature conservation and landscape because few, if any, high quality trees are likely to be impacted (to be confirmed by survey).

5.2.17 Option A has no predicted impacts on pluvial or groundwater flood risk, and although Option A is partially routed through areas of fluvial flooding, loss of fluvial flood storage within Flood zones 2 and 3 can be mitigated by creating replacement flood storage along the watercourse diversions.

5.2.18 Option A performs well against several of the historic environment criteria because the permanent infrastructure is more than 500m, and the construction area more than 100m, from the following designated heritage assets: scheduled monuments, registered parks and gardens, registered battlefields, world

heritage sites and conservation areas. However, there is a Grade II* listed property 400m west of Option A and an historic mill just under 500m east of the option alignment on the River Ock. Option A also crosses the River Ock, where palaeo-environmental remains will likely be present, as well as cropmarks and the Wiltshire-Berkshire canal, which may both warrant a regional heritage value.

5.2.19 Considering the land subtheme, within 250m of Option A there are unlikely to be any contamination sources, other than Marcham Road, the infilled canal and potentially the A354, and no authorised or historic landfills. There is, however, potential for disturbance of unexploded ordnance (UXO) because an early 20th century rifle range was present in the area of Option A.

5.2.20 Considering potential landscape and visual impacts, Option A is likely to affect the landscape character and tranquillity of the National Landscape by the introduction of traffic and highway infrastructure, as well as a noticeable change, in the short term, on the visual amenity of the local community on the eastern edge of Marcham. Option A also performs poorly against one of the landscape and visual criteria because the traffic and highway infrastructure is likely to be visible from sensitive local visual receptors including some PRoW and residential properties in Marcham and there are likely to be some filtered views from Drayton through existing vegetation to Option A, seen in the context of pylons, overhead lines and through traffic on the A34. Overall, therefore, the effect on local views of sensitive visual receptors are likely to be significant.

5.2.21 Option A performs well against the noise criteria because no significant impacts are expected during either construction or operation given that the closest noise sensitive property is located over 300m from Option A.

5.2.22 Option A also performs well against the pollution criteria, considering potential impacts associated with discharges during construction and operation, because standard controls during construction and operation are likely to avoid significant effects.

Community, Planning and Land Performance

5.2.23 Considering potential socio-economic impacts, the construction of Option A may affect access to community assets, such as schools and hospitals, due to temporary disruption to the A415 during construction and may also result in the severance of multiple PRoW that link Marcham to Drayton. There is, therefore, potential to create temporary disruption on roads and disruption on PRoW if not mitigated.

5.2.24 Option A performs well against much of the consenting criteria because, for example, it is not located within specifically designated areas, such as Green Belt, National Landscape, Common Land, Open Space and minerals safeguarding areas. Option A interacts with the local policy for potential future flood alleviation, but it may provide opportunities rather than conflict with this scheme. Option A also interacts with the proposed revised safeguarded area for the Southern Abingdon Movement Corridor under policy ID3 in the consultation draft Joint Local Plan 2041. However, considering the DCO Order Limits extents, Option A is 5.12km in length and extends a small distance outside the

area currently safeguarded for SESRO in VoWH Local Plan policies CP14 and CP14a.

5.2.25 From a transport planning perspective, Option A is judged to partially support existing and planned public transport infrastructure between key destinations, it provides shared use footways beside the access road that provides for and can encourage use of non-motorised transport to reach the reservoir. Option A is an approximately 5.1km route, which could accommodate the Abingdon Flood Alleviation Scheme, and its junction is located away from village of Marcham increasing journeys distances for non-motorised transport from the village. Bus journey times would increase where services along the Marcham Road could be diverted in to the site.

5.2.26 For land acquisition, Option A would only go through agricultural land so there would be no permanent or temporary loss of sensitive properties, but approximately 11% of the agricultural land for Option A is grade 2 and approximately 63.5% is grade 3 agricultural land. There are no identified owners of Special Category Land[18] (SCL) affected by Option A but Abingdon Town Council, a sensitive landowner, is affected by Option A.

5.2.27 Option A is unlikely to result in Category 3[19] parties in its own right.

5.3 Alignment Option B

5.3.1 This section summarises the performance of the Option B considering the appraisal themes and subthemes. For full details of the assessment of Option B against individual criteria, refer to Appendix B. The alignment of Option B is shown in Figure 4.2.

Engineering (Constructability) Performance

5.3.2 Option B requires seven crossings and requires 1.7km of 132kV HV Overhead diversions and a gas diversion over the potential ADC (subject to identification of its final location). From a health and safety perspective, these would increase the risk of endangering workers and require enhanced measures.

5.3.3 For Option B, disruption to the existing road network during enabling works and construction is judged likely to be moderate because construction material will be delivered to site by road, but the rate of deliveries is expected to be below 20HGVs per day, assuming reservoir materials are brought in via train.

5.3.4 With regards to the subthemes of programme, logistics and construction

[18] Special Category Land includes land held by the National Trust inalienably. common, open space or fuel or field garden allotment. Special Category Land is subject to additional provisions in the Planning Act where it is proposed that it should be compulsorily acquired. This includes the possibility of any compulsory acquisition provision in the DCO being subject to special parliamentary procedure. Other special land considerations include utility infrastructure and Crown bodies.

[19] Category 3 parties are defined in Section 57 of the Planning Act 2008. Category 3 parties include parties that the Applicant thinks, if the order sought by the application were made and fully implemented, the person would or might be entitled to make a relevant claim for compensation under Section 10 of the Compulsory Purchase Act 1965 and/or Part 1 of the Land Compensation Act 1973 and/or Section 152(3) of the Act.

complexity, Option B has length of 4.27km and an estimated 92,500m^3 of fill. It has an alignment close to the A34, which brings in the opportunity for the access road bridge across the ADC to also be used for the gas diversion and help facilitate the construction of the ADC box culvert (that enables the A34 to cross the ADC. If construction access can be temporarily provided from the A34 layby, then construction traffic can be allowed from both ends of the road. In addition to this, for Option B, the alignment provides an opportunity to reduce the construction programme associated with the gas diversion and the ADC box culvert. Furthermore, Option B has adequate space on the west side which could be used for construction compounds and Replacement Floodplain Storage. The number of vehicle movements will be related to the length and earthworks required. Access to construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.

Engineering (Operability) Performance

5.3.5 The health and safety criteria during operation considers the risk of endangering operational staff, visitors or members of the public, and also whether access/egress can be provided during normal operations and emergencies. Option B performs well since the road design follows best practice regarding elements such as the speed limit, bend radii, gradients and drainage.

5.3.6 Option B performs well against the operational complexity criterion because it is judged that the majority of maintenance activities could be undertaken during limited closure periods and/or with limited disruption.

5.3.7 Option B performs well for operational resilience because it can accommodate the possible future South Abingdon-on-Thames Bypass and the Abingdon Flood Alleviation Scheme and aligns with the proposed junction for the Dalton Barracks housing development, so Option B is adaptable in that it offers the opportunity for dual functions and flexibility for future modifications. Considering its operational reliability, there are measures identified for Option B to reduce the impact of the main access road being out of operation and although Option B is partially within flood zones 2 and 3, it would be designed to withstand predicted flooding so the risk of flood damage is not considered significant.

5.3.8 From a transport planning perspective, the potential third party impact of Option B is likely to be manageable. Disruption to the existing road network during the operation of Option B is likely to be limited. The junction for Option B has the potential to share a roundabout junction with the proposed housing development at Dalton Barracks and this would provide both opportunities and risks for Option B. Initial traffic modelling of the junction suggests that the capacity at the junction for Option B would reduce over time but that this can likely be managed.

Cost and Carbon Performance

5.3.9 Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 0.4% of the total SESRO costs. Option B results in a total project cost of 0.04% more than the lowest

cost option.

5.3.10 Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option B results in a total project carbon of 0.1% more than the lowest carbon option.

5.3.11 Option B also provides an opportunity for cost-sharing with the possible future South Abingdon-on-Thames Bypass and/or the Abingdon Flood Alleviation Scheme.

Environmental Performance

5.3.12 Option B performs well for all the air quality criteria because the access point for Option B is located more than 1km away from Marcham AQMA and receptors within proximity are considered to be of low sensitivity. The construction and operational activities would likely lead to negligible change in air quality, although an appropriate level of standard dust mitigation may still be required to reduce risk of air quality impacts.

5.3.13 For the aquatic environment subtheme, Option B has no interactions with sensitive groundwater SPZ. There is also no risk identified of WFD deterioration associated with Option B but there are moderate adverse effects on the aquatic environment predicted for Option B due to the main River Ock crossing and one crossing within the Sandford Brook WFD waterbody, including a crossing of the Sandford Brook WFD principal watercourse. Any impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately.

5.3.14 There is one crossing and potential for minor interactions with the course of the eastern watercourse diversion shown in the Gate 2 Indicative Master Plan, which flows through quite a narrow corridor to the east of the site, however any potential impacts could be mitigated by sensitive design.

5.3.15 Option B performs well against much of the biodiversity and nature conservation criteria as, within the boundary of, or in proximity to, Option B, none of the following designated sites were identified: SAC, SPA, Ramsar site, SSSI, NNR and LNR. However, priority habitats, such as floodplain grazing marsh, deciduous woodland and hedgerows, will require removal for the construction of Option B. Desk study of Natural England's Ancient Woodland Inventory and historical maps indicates that no ancient woodland (considered to be irreplaceable habitat) would be affected. Desk study of the Woodland Trust's Ancient Tree Inventory indicates that no ancient or veteran trees (also considered to be irreplaceable habitat) are located close to Option B; however, survey may potentially identify trees that could be classified as ancient or veteran trees.

5.3.16 While the construction of Option B may require the removal of vegetation belts including a limited selection of a woodland belt, Option B performs well for biodiversity and nature conservation and landscape because few, if any, high quality trees are likely to be impacted (to be confirmed by survey).

5.3.17 Option B has no predicted impacts on pluvial or groundwater flood risk, and

although Option B is partially routed (940m) through areas of fluvial flooding, loss of fluvial flood storage within Flood zones 2 and 3 can be mitigated by creating replacement flood storage along the watercourse diversions.

5.3.18 Option B performs well against several of the historic environment criteria because the permanent infrastructure is more than 500m, and the construction area more than 100m, from the following designated heritage assets: scheduled monuments, listed buildings, registered parks and gardens, registered battlefields, world heritage sites and conservation areas. However, there is an historic mill just under 500m east of the option alignment on the River Ock. Option B also crosses the River Ock, where paleo-environmental remains will likely be present, as well as cropmarks and the Wiltshire-Berkshire canal, which may both warrant a regional heritage value.

5.3.19 Considering the land subtheme, within 250m of Option B there are unlikely to be any contamination sources, other than Marcham Road, the infilled canal and potentially the A34, and no authorised or historic landfills. There is, however, potential for disturbance of UXO because an early 20th century rifle range was present in the area of Option B.

5.3.20 Considering potential landscape and visual impacts, Option B is likely to affect the landscape character and tranquillity of the National Landscape by the introduction of traffic and highway infrastructure. Option B also performs poorly against one of the landscape and visual criteria because the traffic and highway infrastructure is likely to be visible from some ProW and there are likely to be some filtered views from Drayton through existing vegetation to Option B, seen in the context of pylons, overhead lines and through traffic on the A34. However, Option B would have limited effect on the visual amenity of the local communities during either construction or operation due to, for example, the intervening pylons, overhead lines, highway vegetation and traffic on the A34 between the western edge of Drayton and Option B. Overall, therefore, the effect on local views of sensitive visual receptors is likely to be significant.

5.3.21 Option B performs well against the noise criteria because no significant impacts are expected during either construction or operation given that the closest noise sensitive property is located over 350m from Option B.

5.3.22 Option B also performs well against the pollution criteria, considering potential impacts associated with discharges, during construction and operation, because standard controls during construction and operation are likely to avoid significant effects.

Community, Planning and Land Performance

5.3.23 Considering potential socio-economic impacts, the construction of Option B may affect access to community assets, such as schools and hospitals, and may also result in the severance of multiple PRoWs that link Marcham to Drayton. There is, therefore, potential to create temporary disruption on roads and disruption on PRoW if not mitigated.

5.3.24 Option B performs well against much of the consenting criteria because, for example, it is not located within specifically designated areas, such as Green

Belt, National Landscape, Common Land, Open Space and minerals safeguarding areas. Additionally, considering the DCO Order Limits extents, Option B extends a small distance outside within the area currently safeguarded for SESRO in VoWH Local Plan policies CP14 and CP14a.

5.3.25 Option B interacts with local policies for potential future flood alleviation and the possible future South Abingdon-on-Thames Bypass, but it may provide opportunities rather than conflict with these. Option B also interacts with the proposed safeguarded area for the Southern Abingdon Movement Corridor in the consultation draft Joint Local Plan 2041 but could provide opportunities for this.

5.3.26 From a transport planning perspective, Option B is judged to partially support existing and planned public transport infrastructure between key destinations and provide shared use footways beside the road that may encourage use of non-motorised transport to reach the reservoir. Option B is however an approximately 4.3km route, which could accommodate the Abingdon Flood Alleviation Scheme and its junction is located away from village of Marcham increasing journeys distances for non-motorised transport from the village. Bus journey times would increase where services along the Marcham Road could be diverted in to the site. The junction to access the road favours walking and cycling from Abingdon over Marcham. Noting that this junction could serve both the reservoir and the proposed Dalton Barracks housing site.

5.3.27 For land acquisition, Option B would go through all agricultural land so there would be no permanent or temporary loss of sensitive properties, but approximately 3% of the agricultural land for Option B is grade 2 and approximately 80% is grade 3 agricultural land. There are no identified owners of SCL affected by Option B, but Abingdon Town Council would be a sensitive landowner affected by Option B.

5.3.28 Option B may result in the identification of a small number of Category 3 parties specifically for this Option but, in the context of the number of Category 3 parties likely to be identified for the project as a whole, this is a very small consideration.

5.4 Alignment Option C

5.4.1 This section summarises the performance of the Option C considering the appraisal themes and subthemes. For full details of the assessment of Option C against individual criteria, refer to Appendix C. The alignment of Option C is shown in Figure 4.2.

Engineering (Constructability) Performance

5.4.2 Option C requires 11 crossings, 1.7km of 132kV HV Overhead diversions and a separate crossing for the gas diversion over the ADC (subject to identification of its final location). These would increase the risk of endangering workers and require enhanced measures, so Option C does not perform well against the construction health and safety criterion.

5.4.3 For Option C, disruption to the existing road network during enabling works and

construction is judged likely to be moderate because construction material will be delivered to site by road, but the rate of deliveries is expected to be below 20HGVs per day, assuming reservoir materials are brought in via train.

5.4.4 With regards to the subthemes of programme, logistics and construction complexity, Option C has length of 4.14km and an estimated 110,000m3 of fill. It has an alignment which is away from the A34, which removes the opportunity for the access road bridge across the ADC to also be used for the gas diversion. A separate arrangement would be required for the ADC crossing and therefore, likely a long construction programme duration. Option C is far away from the A34 and close to existing roads; This is thought to make identification of areas for construction of Replacement Floodplain Storage more challenging. The number of vehicle movements will be related to the length and earthworks required. Access to construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.

Engineering (Operability) Performance

5.4.5 The health and safety criteria during operation considers the risk of endangering operational staff, visitors or members of the public, and also whether access/egress can be provided during normal operations and emergencies. Option C performs well since the road design follows best practice regarding elements such as the speed limit, bend radii, gradients and drainage.

5.4.6 Option C performs well against the operational complexity criterion because it is judged that the majority of maintenance activities could be undertaken during limited closure periods and/or with limited disruption.

5.4.7 Option C is adaptable in that it offers the opportunity for dual function for the possible future South Marcham Bypass, but it offers less opportunity to accommodate other road developments and is not able to accommodate the Abingdon Flood Alleviation Scheme, so it has limited flexibility for future modifications. Considering its operational reliability, there are measures identified for Option C to reduce the impact of the main access road being out of operation and although Option C is partially within flood zones 2 and 3, it would be designed to withstand predicted flooding so the risk of flood damage is not considered significant.

5.4.8 From a transport planning perspective, the potential third party impact of Option C is likely to be manageable. Disruption to the existing road network during the operation of Option C is likely to be limited with the junction location set away from the A34 to decrease the potential impact on traffic flows. It is however close to Marcham, which increases the risk of potential traffic impacts in the village. The junction for Option C has the potential to coincide with the possible future South Marcham Bypass and this would provide opportunities and risks for Option C. Initial traffic modelling of the junction suggests that the capacity at the junction for Option C would reduce over time but that this can likely be managed.

Cost and Carbon Performance

5.4.9 Initial high-level cost estimates indicate that the range in costs for the SESRO

main access road options represents approximately 0.4% of the total SESRO costs. Option C results in a total project cost of 0.4% more than the lowest cost option.

5.4.10 Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option C results in a total project carbon of 0.2% more than the lowest carbon option.

5.4.11 Option C does provide an opportunity for cost-sharing but only with the possible future South Marcham Bypass.

Environmental Performance

5.4.12 Considering potential impacts associated with air quality, Marcham AQMA is approximately 130m west of the access point from the A415 for Option C and there are a number of high sensitivity receptors within 350m of the route for Option C, which have the potential to be affected, although this could be managed through standard construction dust management practice.

5.4.13 For the aquatic environment subtheme, Option C has no interactions with sensitive groundwater SPZ. There is also no risk identified of WFD deterioration associated with Option C but there are moderate adverse effects on the aquatic environment predicted for Option C due the 11 watercourse crossings. There is a main River Ock crossing and also multiple crossings on small tributaries of the River Ock and within the Cow Common Brook WFD waterbody. A crossing on Cow Common Brook, over the proposed watercourse mitigation area, would need re-evaluation, but any other impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately.

5.4.14 There is potential for minor interactions with the course of the eastern watercourse diversion shown in the Gate 2 Indicative Master Plan, which flows through quite a narrow corridor to the east of the site, however any potential impacts could be mitigated by sensitive design.

5.4.15 Option C performs well against much of the biodiversity and nature conservation criteria as, within the boundary of, or in proximity to, Option C, none of the following designated sites were identified: SAC, SPA, Ramsar site, SSSI, NNR and LNR. However, priority habitats, such as floodplain grazing marsh and hedgerows, will require removal for the construction of Option C. Desk study of Natural England's Ancient Woodland Inventory and historical maps indicates that no ancient woodland (considered to be irreplaceable habitat) would be affected. Desk study of the Woodland Trust's Ancient Tree Inventory indicates that no ancient or veteran trees (also considered to be irreplaceable habitat) are located close to Option C; however, survey may potentially identify trees that could be classified as ancient or veteran trees.

5.4.16 While the construction of Option C may require the removal of vegetation belts, Option C performs well for Biodiversity and nature conservation and landscape because few, if any, high quality trees are likely to be impacted (to be confirmed by survey).

5.4.17 Option C has no predicted impacts on pluvial or groundwater flood risk, and although Option C is partially routed (2,340m) through areas of fluvial flooding, loss of fluvial flood storage within Flood zones 2 and 3 can be mitigated by creating replacement flood storage along the watercourse diversions.

5.4.18 Option C performs well against several of the historic environment criteria because the permanent infrastructure is more than 500m, and the construction area more than 100m, from the following designated heritage assets: scheduled monuments, registered parks and gardens, registered battlefields and world heritage sites. However, there is a Grade II* listed property 160m northwest of Option C and Marcham conservation area just under 500m northwest of Option C. Option C also crosses the River Ock, where palaeo-environmental remains will likely be present, as well as cropmarks and the Wiltshire-Berkshire canal, which may both warrant a regional heritage value.

5.4.19 Considering the land subtheme, within 250m of Option C there are unlikely to be any contamination sources, other than Marcham Road and the infilled canal, and no authorised or historic landfills. There is, however, potential for disturbance of UXO because an early 20th century rifle range was present in the area of Option C.

5.4.20 Considering potential landscape and visual impacts, Option C is likely to affect the landscape character and tranquillity of the National Landscape by the introduction of traffic and highway infrastructure, and it also performs poorly against several of the landscape and visual criteria as follows:

- The traffic and highway infrastructure for Option C is likely to erode the levels of tranquillity of the area and significantly affect the local landscape character even with mitigation in place.
- The traffic and highway infrastructure for Option C is likely to be visible from some PRoW, an isolated residential property and other residential properties in Marcham, and there are likely to be some filtered views through existing vegetation from Drayton to Option C, seen in the context of pylons, overhead lines and existing traffic on the A34.
- The traffic and highway infrastructure for Option C is likely to lead to very noticeable changes to the visual amenity of local communities during construction and operation. The impact on the day-time visual amenity of the local community on the eastern edge of Marcham would remain significant even with mitigation.

5.4.21 Overall, therefore, the effects on local landscape character and on local views from sensitive visual receptors are likely to be significant, and there may be complete or very noticeable changes to visual amenity of local communities in Marcham and Drayton.

5.4.22 There are 17 noise sensitive properties <185m of Option C so there may be potential for significant noise effects during construction, although they are likely to be mitigated. One property is approximately 100m from Option C so, in operation, there may be impacts associated with noise for that single property due to operational traffic movements, although potential significant (operational)

noise effects are likely to be mitigated if they occur.

5.4.23 Option C performs well against the pollution criteria, considering potential impacts associated with discharges during construction and operation, because standard controls during construction and operation are likely to avoid significant effects.

Community, Planning and Land Performance

5.4.24 Considering potential socio-economic impacts, the construction of Option C may affect access to community assets, such as schools and hospitals, and may also result in the severance of multiple PRoW that link Marcham to Drayton. There is, therefore, potential to create temporary disruption on roads and disruption on PRoW if not mitigated. Option C also performs poorly against a socio-economic criterion since the nearest property is 100m away from Option C.

5.4.25 Option C performs well against much of the consenting criteria because, for example, it is not located within specifically designated areas, such as Green Belt, National Landscape, Common Land, Open Space and minerals safeguarding areas. Option C interacts with the local policy for the possible future South Marcham Bypass, but it may provide opportunities rather than conflict with this scheme. Option C lies outside the area currently safeguarded for SESRO in VoWH Local Plan policies CP14 and CP14a.

5.4.26 From a transport planning perspective, Option C is judged to support existing and planned public transport infrastructure between key destinations and its shared use footways beside the road may encourage non-motorised transport to reach the reservoir. Option C is an approximately 4.4km route but performs well for sustainable and non-motorised users because its junction, which provides access to the existing road network, is further from Abingdon and nearer to Marcham, which has been identified as a location that would provide more favourable access for pedestrians and cyclists as well as bus routes.

5.4.27 For land acquisition, Option C would go through all agricultural land so there would be no permanent or temporary loss of sensitive properties, but approximately 69% of the agricultural land for Option C is grade 3 agricultural land. There are no identified owners of SCL affected by Option C.

5.4.28 Option C may result in the identification of a small number of Category 3 parties specifically for this Option but, in the context of the number of Category 3 parties likely to be identified for the project as a whole, this is a very small consideration.

5.5 Alignment Option D

5.5.1 This section summarises the performance of the Option D considering the appraisal themes and subthemes. For full details of the assessment of Option D against individual criteria, refer to Appendix D. The alignment of Option D is shown in Figure 4.2.

Engineering (Constructability) Performance

5.5.2 Option D requires crossings, 1.7km of 132kV HV Overhead diversions and a gas diversion over the ADC (subject to identification of its final location). From a health and safety perspective, these would increase the risk of endangering workers and require enhanced measures. Option D however has only 7 crossings and a length of 4.05km, so it performs well against the health and safety criteria.

5.5.3 For Option D, disruption to the existing road network during enabling works and construction is judged likely to be moderate because construction material will be delivered to site by road, but the rate of deliveries is expected to be below 20HGVs per day, assuming reservoir materials are brought in via train.

5.5.4 With regards to the subthemes of programme, logistics and construction complexity, Option D has length of 2.6km and an estimated 91,000m3 of fill. It has an alignment close to the A34, which brings in the opportunity for the access road bridge across the ADC to also be used for the gas diversion and help facilitate the construction of the ADC box culvert (that enables the A34 to cross the ADC. However, this would be more complex than Options A and B due to the increased distance from the A34. Option D has a lot of space on the west side for construction compounds and Replacement Floodplain Storage. The number of vehicle movements will be related to the length and earthworks required. Access to construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.

Engineering (Operability) Performance

5.5.5 The health and safety criteria during operation considers the risk of endangering operational staff, visitors or members of the public, and also whether access/egress can be provided during normal operations and emergencies. Option D performs well since the road design follows best practice regarding elements such as the speed limit, bend radii, gradients and drainage.

5.5.6 Option D performs well against the operational complexity criterion because it is judged that the majority of maintenance activities could be undertaken during limited closure periods and/or with limited disruption.

5.5.7 Option D is adaptable in that it offers the opportunity for dual function for the possible future South Abingdon-on-Thames Bypass, but it offers less opportunity to accommodate other road developments and is not able to accommodate the Abingdon Flood Alleviation Scheme, so it has limited flexibility for future modifications. Considering its operational reliability, there are measures identified for Option D to reduce the impact of the main access road being out of operation and although Option D is partially within flood zones 2 and 3, it would be designed to withstand predicted flooding so the risk of flood damage is not considered significant.

5.5.8 From a transport planning perspective, the potential third party impact of Option D is likely to be manageable. Disruption to the existing road network during the operation of Option D is likely to be limited with the junction location set back from the A34 to decrease the risk of impact on the A34. Initial traffic modelling

of the junction suggests that the capacity at the junction for Option D would reduce over time but that this can likely be managed.

Cost and Carbon Performance

5.5.9 Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 0.4% of the total SESRO costs. Option D results in a total project cost that is the lowest cost option.

5.5.10 Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option D is the lowest carbon option.

5.5.11 Option D does provide an opportunity for cost-sharing but only with the possible future South Abingdon-on-Thames Bypass.

Environmental Performance

5.5.12 Considering potential impacts associated with air quality, Marcham AQMA is approximately 400m west of the access point from the A415 for Option D and there are a number of sensitive receptors, which have the potential to be affected, although this could be managed through standard construction dust management practice.

5.5.13 For the aquatic environment subtheme, Option D has no interactions with sensitive groundwater SPZ. There is also no risk identified of WFD deterioration associated with Option C but there are moderate adverse effects on the aquatic environment predicted for Option C due the main River Ock crossing and also multiple crossings on small tributaries of the River Ock and within the Cow Common Brook WFD waterbody. A crossing on Cow Common Brook, over the proposed watercourse mitigation area, would need re-evaluation, but any other impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately.

5.5.14 There is one crossing and potential for minor interactions with the course of the eastern watercourse diversion shown in the Gate 2 Indicative Master Plan, which flows through quite a narrow corridor to the east of the site, however any potential impacts could be mitigated by sensitive design.

5.5.15 Option D performs well against much of the biodiversity and nature conservation criteria as, within the boundary of, or in proximity to, Option D, none of the following designated sites were identified: SAC, SPA, Ramsar site, SSSI, NNR and LNR. However, priority habitats, such as floodplain grazing marsh, deciduous woodland and hedgerows, will require removal for the construction of Option D. Desk study of Natural England's Ancient Woodland Inventory and historical maps indicates that no ancient woodland (considered to be irreplaceable habitat) would be affected. Desk study of the Woodland Trust's Ancient Tree Inventory indicates that no ancient or veteran trees (also considered to be irreplaceable habitat) are located close to Option D; however, survey may potentially identify trees that could be classified as ancient or veteran trees.

5.5.16 While the construction of Option D may require the removal of vegetation belts

including a limited selection of a woodland belt, Option D performs well for biodiversity and nature conservation and landscape because few, if any, high quality trees are likely to be impacted (to be confirmed by survey).

5.5.17 Option D has no predicted impacts on pluvial or groundwater flood risk, and although Option D is partially routed (1,050m) through areas of fluvial flooding, loss of fluvial flood storage within flood zones 2 and 3 can be mitigated by creating replacement flood storage along the watercourse diversions.

5.5.18 Option D performs well against several of the historic environment criteria because the permanent infrastructure is more than 500m, and the construction area more than 100m, from the following designated heritage assets: scheduled monuments, registered parks and gardens, registered battlefields, world heritage sites and conservation areas. However, there is a Grade II* listed property 380m northwest of Option D. Option D also crosses the River Ock, where palaeo-environmental remains will likely be present, and an Iron Age and Romano-British field system, which may be of regional heritage value. The route option crosses the historic Wiltshire-Berkshire Canal which might be of regional heritage value.

5.5.19 Considering the land subtheme, within 250m of Option D there are unlikely to be any contamination sources, other than Marcham Road and the infilled canal, and no authorised or historic landfills. There is, however, potential for disturbance of UXO because an early 20th century rifle range was present in the area of Option D.

5.5.20 Considering potential landscape and visual impacts, Option D is likely to affect the landscape character and tranquillity of the National Landscape by the introduction of traffic and highway infrastructure, as well as noticeable change, in the short term, to the visual amenity of the local community on the eastern edge of Marcham. Option D also performs poorly against two of the landscape and visual criteria as follows:

- The traffic and highway infrastructure for Option D is likely to erode the levels of tranquillity of the area and significantly affect the local landscape character, even with mitigation in place.
- Option D is likely to be visible from some PRoW and residential properties in Marcham, and there are likely to be some filtered views from Drayton through existing vegetation, seen in the context of pylons, overhead lines, and existing traffic on the A34.

5.5.21 Overall, therefore, the effects on local landscape character and on local views from sensitive visual receptors are likely to be significant.

5.5.22 Option D performs well against the noise criteria because no significant impacts are expected during either construction or operation given that the closest noise sensitive property is located over 300m from Option D.

5.5.23 Option D also performs well against the pollution criteria, considering potential impacts associated with discharges during construction and operation, because standard controls during construction and operation are likely to avoid significant effects.

Community, Planning and Land Performance

5.5.24 Considering potential socio-economic impacts, the construction of Option D may affect access to community assets, such as schools and hospitals, and may also result in the severance of multiple PRoW that link Marcham to Drayton. There is, therefore, potential to create temporary disruption on roads and disruption on PRoW, if not mitigated.

5.5.25 Option D performs well against much of the consenting criteria because, for example, it is not located within specifically designated areas, such as Green Belt, National Landscape, Common Land, Open Space and minerals safeguarding areas, and has low interaction with existing infrastructure. However, considering the DCO Order Limits extents, Option D lies outside the area currently safeguarded for SESRO in VoWH Local Plan policies CP14 and CP14a.

5.5.26 From a transport planning perspective, Option D is judged to support existing and planned public transport infrastructure between key destinations and its shared use footways beside the road may encourage non-motorised transport to reach the reservoir. Option C performs well for sustainable and non-motorised users because it is a direct approximately 4.05km route and its junction is further from Abingdon and nearer to Marcham, which has been identified as a location that would provide more favourable access for pedestrians and cyclists as well as bus routes.

5.5.27 For land acquisition, Option D would go through all agricultural land so there would be no permanent or temporary loss of sensitive properties, but approximately 71% of the agricultural land for Option D is grade 3 agricultural land. There are no identified owners of SCL affected by Option D.

5.5.28 Option D may result in the identification of a small number of Category 3 parties specifically for this Option but, in the context of the number of Category 3 parties likely to be identified for the project as a whole, this is a very small consideration.

6 SESRO Main Access Road: Preferred Option

This section summarises appraisal step 6 to identify a preferred option for the SESRO main access road for use in master planning and consultation.

6.1 Comparison of Engineering Performances

6.1.1 For the constructability and operability themes, the two tables below present a comparison of options for the SESRO main access road by subtheme, after their assessment against the appraisal criteria (reported in Section 5) and workshop discussion.

Table *6.1*: SESRO Main Access Road - Constructability Subtheme Narratives

Subtheme	Narrative
Health and Safety	It should be noted when considering the health and safety subtheme that no unmitigable construction health and safety risks were identified at this stage for any of the options that significantly differentiated them from the other options. Therefore, when considering the preferred option under this subtheme, the utility diversions that are likely to be required for each option are considered, as well as the number of crossings and road length. A short section of intermediate pressure gas pipe would be required to be diverted to allow for the construction of the ADC (as set out in the Indicative Gate 2 Master Plan). Options A, B and D for the SESRO main access road could be used to facilitate this diversion, whereas Option C would require separate crossings for the gas diversion over the ADC and the SESRO main access road over the ADC. Option C also has the highest number of crossings out of the four options with 11 crossings compared with Option A's 8 crossings and Option B and D's 7 crossings. All options require approximately 1.7km of 132kV HV overhead diversions. Option D is the preferred option for health and safety because it has the joint fewest crossings (7 crossings) and the shortest length (4.05km), which is assumed to shorten the construction duration and therefore length of exposure to risk. It also can have a combined crossing with the gas diversion over the ADC.
Third Party Impact	The third party impact assessment is similar for all options so is not a differentiating factor between options when identifying the preferred option. The largest third party impact would be the temporary access required for building the initial temporary access road and the volume of construction traffic required to facilitate this, however, this will be very similar for all options.

Subtheme	Narrative
	The next impact would be the construction and tie in of the new roundabout required for all options. This will require traffic management and may cause disruption to journeys for a period.
Logistics	Options A and B are more closely aligned with the A34 than Options C and D. This would result in more space on the west side of the road for construction compounds and replacement flood storage, which will need to account for the road embankment being located within the floodplain. Option D provides more space on the west side for construction compounds and replacement flood storage volume than Option C, but less than Options A and B. On this basis, Options A and B are slightly preferred for this subtheme of logistics. It was also noted during assessments that with increased space on the west side, there is more space to facilitate a FSR for Abingdon – this is considered only as a potential benefit (should the FSR be included in the SESRO project at a later date) for Options A and B, rather than a significant differentiating factor between the options when identifying preferences (due to the reasons outlined in paragraph 2.7.4).
Programme	All options have a similar programme duration, however, there are differentiating factors that should be considered that relate to programme risk. Options B and D are the shortest in length and require approximately 10,000 to 11,000m^3 less fill material to construct the access road compared to Option A and will therefore likely have the shortest construction programme duration. The critical path element of the access road is the initial construction of a temporary haul road. As Options B and D are also a reduced length in comparison to Option A, this will likely reduce the critical path. Refer to Table 4.2 for road option fill volumes. Options B and D also have the least crossings to make, both with seven crossings, which would have potential to reduce the construction programme and potentially construction costs. Options A, B and D are close to the A34 with Option A being the closest. All three of these options bring the opportunity for the access road bridge across the ADC (subject to its final location) to also be used for a required gas diversion and provide an opportunity to facilitate the construction of the ADC box culvert. This would not be possible for Option C, which would require a separate arrangement and, therefore, likely a longer construction programme duration.

Subtheme	Narrative
	Constructing Option C through a larger floodplain increases the difficulty of constructing an access road along with an increased volume of fill. As such, this option would increase the critical path and programme duration and be further increased by the need for two crossings of the ADC infrastructure – one crossing of the ADC itself and one of the siphon channel. Option C could, however, potentially include programme savings if the possible future South Marcham Bypass were to have been constructed ahead of the SESRO project, although this potential saving is not considered with much weight when comparing options under the subtheme of programme given that there are no specific development proposals for the South Marcham Bypass at the time of this study. Due to its shorter length, fewer crossings and potential to be combined with other schemes, Option B is marginally preferred for the programme subtheme, although there is limited difference between each option.
Construction Complexity	No unmitigable construction issues were identified for any of the four road alignment options during their assessments. However, they do have distinct elements that potentially reduce and increase construction complexity. All options are to be constructed within the River Ock floodplain; Option C has a higher proportion of its length within the floodplain. As previously mentioned within the programme considerations, the current working assumption is that fewer crossings would likely result in reduced construction complexity. On this basis, Options B and D are the preferred options, when considered against Options A and C, because they have fewer crossings. It is noted that, considering the ADC as its positioned in the Indicative Gate 2 Master Plan, Option C would cross the ADC infrastructure twice (the ADC itself and the siphon channel). At this stage, the ADC infrastructure crossing would be considered a larger and more complex crossing. As detailed in the programme subtheme above, Options A, B and D (but not Option C) bring the opportunity for the bridge across the ADC to also be used for utility diversions, specifically a diversion of an intermediate pressure gas main and provide an opportunity to facilitate the construction of the ADC. Combining crossings would help reduce construction complexity and increase efficiency within the SESRO project. The next defining factor is the roundabout required on Marcham Road to allow access to the SESRO reservoir. At this stage the roundabout location for Options A and D is considered preferable because it is furthest from any existing junctions and can be built

Subtheme	Narrative
	without closing both lanes of the existing road, meaning that one lane can remain open to traffic with temporary traffic management measures (such as temporary lights) in place during construction. However, the location for Option B would likely be the least complex to construct because the use of the existing 'T-Junction' would allow traffic to be moved into a single lane using temporary traffic management measures. This would avoid road closures and allow traffic to continue on the A415 during construction of Option B. The construction of Option B would ultimately replace the existing T-Junction on the A415 with a roundabout, making it safer for road users on the A415 in the long term after construction works have been completed. In addition, Option B has a potential to share the roundabout junction with the Dalton Barracks housing development scheme, which could increase construction complexity, however, all options would need to make allowance for any future traffic from the potential redevelopment of Dalton Barracks into consideration in the design of the roundabout. Overall, the assessment concludes that construction complexity is similar for all options, except Option C which performs marginally worse than the other options. It was also noted during assessments that all options have the potential for conflict or interaction with the possible future South Abingdon-on-Thames Bypass and/or the potential FSR for Abingdon. Options A, B and D have the greatest potential for shared opportunities with a potential alignment for the South Abingdon-on-Thames Bypass, as they run closest to the A34. Option C has the highest potential to conflict with the potential FSR for Abingdon due to its alignment, whereas Options A and B, being further east, would provide more space for the potential FSR for Abingdon as a potential benefit. However, as outlined in paragraph 2.7.4, due to project uncertainty, these are considered as additional potential benefits and as such are not directly considered in option selection at this stage.

Source: Thames Water Internal, 2024

Table *6.2*: SESRO Main Access Road - Operability Subtheme Narratives

Subtheme	Narrative
Health and Safety	Health and safety during operation of the road options should all be acceptable, so long as the roads are designed in accordance with appropriate standards, such as the Design Manual for Roads and

Subtheme	Narrative
	Bridges. This subtheme is therefore not considered a material differentiator between options in this appraisal.
Operational Complexity	The operational complexity involves maintenance of the roads, which will be the same for all road options. This subtheme is therefore not considered a material differentiator between options in this appraisal.
Operational Resilience	The operational reliability of options and their adaptability during operation are considered as part of the operational resilience subtheme. One of the differentiating criteria for this subtheme relates to how well the road may facilitate other potential external schemes, summarised as follows: • Options A and B could facilitate the potential FSR for Abingdon and the possible future South Abingdon-on-Thames Bypass as potential benefits. • Option C could facilitate the possible future South Marcham Bypass but conflicts with the potential FSR for Abingdon. • Option D could facilitate the possible future South Abingdon-on-Thames Bypass but conflicts with the potential FSR for Abingdon. Options A and B are therefore preferable over Options C and D, but the status of these external schemes and timescales for their delivery needs further consideration when looking at the potential impacts and benefits of each road option. As outlined in paragraph 2.7.4, due to project uncertainty, these are considered as additional potential benefits and secondary to the selection of the optimal route alignment to meet the needs of the SESRO project.
Transport Planning	Disruption on the existing road network during operation is likely to be limited for all options and initial traffic modelling indicates that for all options the reduction in capacity (with time) at the highway junctions can be managed. Therefore, the transport planning subtheme under operability is not considered a significant differentiator between options in this appraisal. The alternative junction locations have been considered at a high-level and is not considered to be a significant differentiator. Option B lines up well with the potential Dalton Barracks housing development, which could be advantageous if this development were progressed as a single roundabout could give access both to SESRO and the housing development.

Source: Thames Water Internal, 2024

6.1.2 Options A and B are considered preferred in the overall engineering assessment based on the following:

- Overall, Option C has marginally the largest estimated earthworks required and more watercourse crossings. It also has a higher proportion of its length

within the floodplain, making its construction more complicated and longer in duration.

- Options A and B leave more space than Options C and D for construction compounds and volume for replacement flood storage, which is required for roads located in the River Ock floodplain. Options C and D being further west have less potential to provide space for these.
- Assuming the ADC position as in the Indicative Gate 2 Master Plan, Option A, B and D provide an opportunity for a gas main diversion to facilitate the construction of the ADC, to be incorporated into the bridge crossing over the ADC required by the SESRO main access road. Option C does not provide this opportunity and potentially requires two crossings of the ADC infrastructure (the ADC itself and the siphon channel).
- It was also noted from the assessments that Options A, B and (to a lesser extent) D provide better opportunities than Option C to facilitate external schemes, such as the possible future South Abingdon-on-Thames Bypass and the potential FSR for Abingdon.

6.2 Comparison of Cost and Carbon Performances

6.2.1 For the cost and carbon theme, the table below presents a comparison of options for the SESRO main access road by subtheme, after their assessment against the appraisal criteria (reported in Section 5) and workshop discussion.

Table 6.3: SESRO Main Access Road - Cost and Carbon Subtheme Narratives

Subtheme	Narrative
Cost	Option C has the largest estimated cost and Option D has the lowest estimated cost. However, the range in costs for the options represent approximately 0.4% of the total SESRO costs. Given this small range, none of the options are considered to have a cost that would be disproportionate or so great in comparison with the other options that it would be an unreasonable preference (if it performs well in the other subthemes). Cost is therefore not seen as a strong justification for identifying one option over another as preferred. There may be opportunities for cost-sharing with several of the external schemes (identified in section 3.3), but given the uncertainty over the status of such schemes, these opportunities are noted rather than used to form a preference amongst the options from a cost perspective. Option A and B may provide opportunities for cost sharing with the possible future South Abingdon-on-Thames Bypass and the potential FSR for Abingdon. Comparatively, while Option C may have the opportunity to cost share with the possible future South Marcham Bypass and Option D with the possible future South Abingdon-on-Thames Bypass, both Options C and D would likely preclude the potential FSR for

Subtheme	Narrative
	Abingdon given their alignments would reduce the FSR volume available.
Carbon	From initial high-level estimates, Option D has the lowest capital carbon emissions so would be preferred under this criterion. Option A has the highest capital carbon emissions so would be least preferred. However, for the same reasoning as with cost, carbon is not considered to be a material differentiator between options at this stage.

Source: Thames Water Internal, 2024

6.2.2 To summarise, neither capital cost nor capital carbon are currently considered as material differentiators between options, when identifying a preferred option, because among the indicative high-level estimates none are disproportionately large in comparison with the other options such that one option is an unreasonable preference if it performs well in the other subthemes.

6.3 Comparison of Environmental Performances

6.3.1 For the environmental performance theme, the table below presents a comparison of the options for the SESRO main access road by subtheme, after their assessment against the appraisal criteria (reported in Section 5) and workshop discussion. The subtheme narratives in the table consider options during both construction and operation.

Table *6.4*: SESRO Main Access Road - Environmental Subtheme Narratives

Subtheme	Narrative
Air Quality	No significant impacts to air quality are expected during construction or operation, although Option C is marginally the least preferred due to proximity of nearby sensitive receptors and Marcham AQMA, and Option B is the most preferred due to relative distance from the AQMA and sensitive receptors. However, as all impacts are capable of mitigation by standard best practice measures, this is not considered a material differentiator between the options in this appraisal.
Aquatic Environment	Option C has the largest number of watercourse crossings (11), whilst other options have either 7 crossings (Options B and D) or 8 crossings (Option A). None of the options are considered to carry a WFD water body scale deterioration risk, due to the preferred construction method (as detailed in 0). Options A to D will all interact with the current course of the eastern watercourse diversion, which flows through quite a narrow corridor to the east of the site. Further consideration is needed to fit any of these options in with the eastern watercourse diversion design, so it does not pose any conflicts to the contribution the

Subtheme	Narrative
	eastern watercourse diversion provides to the project's overall biodiversity gain by providing a natural watercourse channel with no / limited watercourse crossings. In terms of effects on aquatic (priority) habitats, the assessment assumes that where principal / main watercourses are crossed a clear span bridge is used, most notably on the main River Ock crossed by all options as well as the Sandford Brook crossed by Options A and B. As noted in paragraph 1.3.3 the aquatic assessment is undertaken in the absence of baseline data for the local watercourses and there may be sensitive or notable species present that may influence decision making in future. None of the options interact with designated groundwater features. Although there are minor differences in the option assessments, there are no significant risks for aquatic environment and this subtheme is therefore not considered to be a strong differentiator between options in this appraisal and no preference between the options has been identified for the aquatic environment.
Biodiversity and Nature Conservation	Desk study indicates that no ancient woodland would be affected by any of the options. Desk study indicates that no ancient or veteran trees would be affected by any of the options, but surveys may potentially indicate trees that could be classified as ancient or veteran trees. The construction of any of the road options will require the removal of priority habitats such as floodplain grazing marsh, deciduous woodland, and hedgerow, which will need further consideration and mitigation, as well as the requirement to cross the River Ock. The biodiversity and nature conservation subtheme is therefore not considered a material differentiator between the options in this appraisal.
Biodiversity and Nature Conservation and Landscape	The construction of the road for all options will require the removal of vegetation belts and (except for Option C) a limited section of a woodland belt; therefore, this subtheme is not a material differentiator between the options in this appraisal.
Flood Risk	The construction of the access road to the SESRO reservoir will not adversely impact on pluvial or groundwater flood risk. All options are routed partially through areas of fluvial flooding, which can be mitigated for by creating replacement flood storage along the watercourse diversions. The flood risk subtheme is therefore not considered a material differentiator between options in this appraisal.
Historic Environment	Options A, B and D have the potential to affect the setting of a Grade II* listed building, with A, B and D also potentially changing

Subtheme	Narrative
	the setting of a listed historic mill and bridge. All options cross the River Ock where palaeo-environmental remains are likely present. In addition, Options A and B pass through an Iron Age and Romano-British cropmark complex and potential settlement and all options cross the historic Berkshire-Wiltshire Canal route (although the canal is not currently extant). Option C has the potential to affect the setting of more designated receptors than other options, such as listed buildings within Marcham and the Marcham Conservation Area. Therefore, Option C is the least preferred in terms of changes to the setting of listed buildings and conservation areas. Options A, B and D are least preferred in terms of impacts to non-designated buried archaeological remains. Overall, Option C is the least preferable as changes to the setting of statutory designations will be permanent in operational terms and likely more challenging to mitigate, whereas impacts to buried archaeological remains can be mitigated to a greater extent through preservation by record. The historic environment subtheme is not considered a material differentiator between Options A, B, and D in this appraisal.
Land Quality	All options may have the potential to encounter land contamination and possibly UXO with further assessment required to assess the extent of any risks and to reduce uncertainty; therefore, the land quality subtheme is not considered a material differentiator between the options in this appraisal.
Landscape and Visual	All options would affect local landscape character and visual receptors due to the introduction of traffic, highway infrastructure and limited lighting into the rural and generally undeveloped landscape. The road would interrupt the small to large-scale field pattern divided by hedgerows and tree/woodland belts along watercourses which would erode a key characteristic contributing to the local landscape character and setting of the North Wessex Downs National Landscape. Option B is preferred in landscape and visual impact terms as it would keep the new road closest to the existing A34 highway corridor. Option C is the least preferred due to impacts upon landscape character and the visual amenity of Marcham where some significant effects may remain during operation.
Noise	Noise modelling has indicated that Option C is the only option with adverse noise impacts. The closest noise sensitive property is located approximately 100m from Option C, with a further 17 properties which have the potential to be affected during construction and a single property predicted to be affected during operation.

Subtheme	Narrative
	On this basis, Option C is not preferred but noise is not a material differentiator between Options A, B and D for which no adverse effects are predicted.
Pollution	No potential significant effects are likely for any option because emissions to land and water can be controlled through standard good practice construction methods and mitigation; therefore, the pollution subtheme is not considered a material differentiator between the options in this appraisal.

Source: Thames Water Internal, 2024

6.3.2 Overall, all road options have very similar environmental impacts. However, Option B is preferred in terms of landscape and visual impact as it is nearest to the existing A34 and has a lower likelihood of air quality impacts due to distance from receptors. Option C is the least preferred due to the identified noise impacts and the potential to affect the setting of more historic receptors than other options.

6.4 Comparison of Community, Planning and Land Performances

6.4.1 For the community, planning and land theme, the table below presents a comparison of the options for the SESRO main access road by subtheme, after their assessment against the appraisal criteria (reported in Section 5) and workshop discussion.

Table 6.5: SESRO Main Access Road - Community, Planning and Land Subtheme Narratives

Subtheme	Narrative
Socio-Economic	All road options may result in travel disruption during construction between communities in Marcham and Drayton, including access to primary and secondary schools. Multiple PRoW will be severed by the construction of all road options. Mitigation is expected to maintain and potentially enhance access for the PRoW. This is, therefore, not considered to be a material differentiator.
Consenting	Options A to D are evaluated very similarly for consenting, with it not being a strong differentiator, but there is a slight advantage to Option B as it requires the least Order Limits extent and remains within the area safeguarded for SESRO in existing local policy. All four road options interact with one or more local policies for potential future flood alleviation and/or road bypass routes but may provide opportunities rather than conflict with these.
Transport Planning	Option A is a slightly longer road, however, the difference in length is not considered to result in a very significant difference from a transport planning point of view. Option C and D are favourable in the transport planning aspects, mainly as they are considered to better accommodate non-motorised users. This is

Subtheme	Narrative
	due to the fact that they provide more favourable access for non-motorised users (including pedestrians, cyclists and those using public transport) to and from Marcham, the nearest population centre. From the transport planning perspective Option D is considered to be slightly preferred compared with the other options – as it is shorter and comes directly from a settlement; however, this is not considered to be a strong differentiator between Options C and D, which both perform marginally better than Options A and B.
Property and Land Acquisition	All options go through agricultural land. Options A and B would take small amounts of Grade 2 land, whilst C and D do not include any Grade 2 land. Option B would pass relatively close to a strategic development site (Dalton Barracks) with a draft allocation for development. This could either present as a risk or opportunity for a roundabout on the A415 depending on how the allocation progresses. Option B is likely to result in marginally less Category 3 parties than Options A, C and D. Options A, C and D are likely to result in broadly the same number of Category 3 parties. Overall, Option B may develop as a risk or opportunity as Dalton Barracks progresses, but it is currently not possible to determine either way. All options have broadly the same impact, so the land acquisition subtheme is not considered as a material differentiator.

Source: Thames Water Internal, 2024

6.4.2 The comparisons in Table 6.5 are summarised below:

- Socio-economic: All road options are considered to have a similar socio-economic impact, so it is not considered a material differentiator.
- Consenting: Consenting criteria are not a key differentiator between the options, but Option B is slightly favoured due to likely needing the least amount of land to be including within the scope of the DCO and remaining fully within the area safeguarded for SESRO in the current VoWH Local Plan.
- Transport Planning: Options C and D are slightly more favourable due to their routes being better connected to existing settlements.
- Property and Land Acquisition: All options have broadly the same impact, but Option B may develop into a risk or opportunity, depending on how the A415 roundabout is perceived by the developer as Dalton Barracks progresses.

6.4.3 Overall, for community, planning and land there is no clear preferred option, the options are finely balanced between the subthemes.

6.5 Confirmation of Preferred Option

6.5.1 The outcome from the assessment and workshop for the SESRO main access road is that there is that there is little to differentiate options across Engineering, Cost and Carbon, Environment and Community, Planning and Land themes.

6.5.2 However, Option B performs slightly better than the other options in a few areas, such as:

- Landscape and visual impact – Option B performs best as it is nearest to the existing A34 so would be located next to existing highways infrastructure development.
- Consenting - Option B is slightly preferred due to requiring the least additional land to be included in the scope of the DCO and remaining fully within the area safeguarded for SESRO in the current VoWH Local Plan.

6.5.3 Option B is therefore the preferred option for the SESRO main access road, confirmed for use in master planning and consultation. In addition, it is noted that Option B provides the opportunity to work in partnership with external schemes, such as Dalton Barracks, the possible future South Abingdon-on-Thames Bypass and the potential FSR for Abingdon.

7 Steventon to East Hanney Road Diversion: Constraints on Options Definition

This section defines the constraints on option definition for the Steventon to East Hanney road diversion in accordance with step 2 of the appraisal methodology.

7.1 Define Constraints on Option Definition

7.1.1 The alignment of the Steventon to East Hanney diversion road is constrained in that it must retain east-west connection between Steventon and East Hanney for vehicular access. The existing road connection is approximately 5.5km long.

7.1.2 The alignment of the road diversion is constrained by the reservoir embankment, meaning that it must be routed either north or south of the proposed reservoir footprint.

7.1.3 Alignments for the road diversion going north of the reservoir embankment were considered unfeasible due to the following constraints:

- The River Ock floodplain.
- The corridor for future canal diversion as shown in the Indicative Gate 2 Master Plan.
- The areas identified at Gate 2 for watercourse diversions, flood replacement storage and wetland areas as part of the SESRO project.
- The operational areas of the SESRO site and main visitor access as in the Indicative Gate 2 Master Plan.

7.1.4 To the south of the reservoir embankments, the Great Western Railway line and proposed rail siding and material handling area were identified as constraints to the south of the reservoir embankment.

7.1.5 The following external schemes were identified for consideration in the options appraisal for the Steventon to East Hanney road diversion:

- Wantage and Grove Railway Station: It is noted that the VoWH District Council in their local plan[20] and OCC in their local transport and connectivity plan[21] both have plans for a new railway station at Wantage and Grove. This also remains proposed in the consultation draft VoWH and South Oxfordshire Joint Local Plan 2041, referenced above. The possible station locations are southwest of the SESRO site.

[20] VoWH District Council, *Vale Local Plan Part 1 Review* (2021), page 24. Available online: https://www.whitehorsedc.gov.uk/wp-content/uploads/sites/3/2021/12/Local-Plan-Part-1-Review-Dec-2021..pdf

[21] Oxfordshire County Council, *Connecting Oxfordshire - Local Transplant Plan 2015-2031, Volume 3 - Rail Strategy* (2016), page 52. Available online: https://www.oxfordshire.gov.uk/sites/default/files/file/roads-and-transport-connecting-oxfordshire/ConnectingOxfordshireRailStrategy.pdf

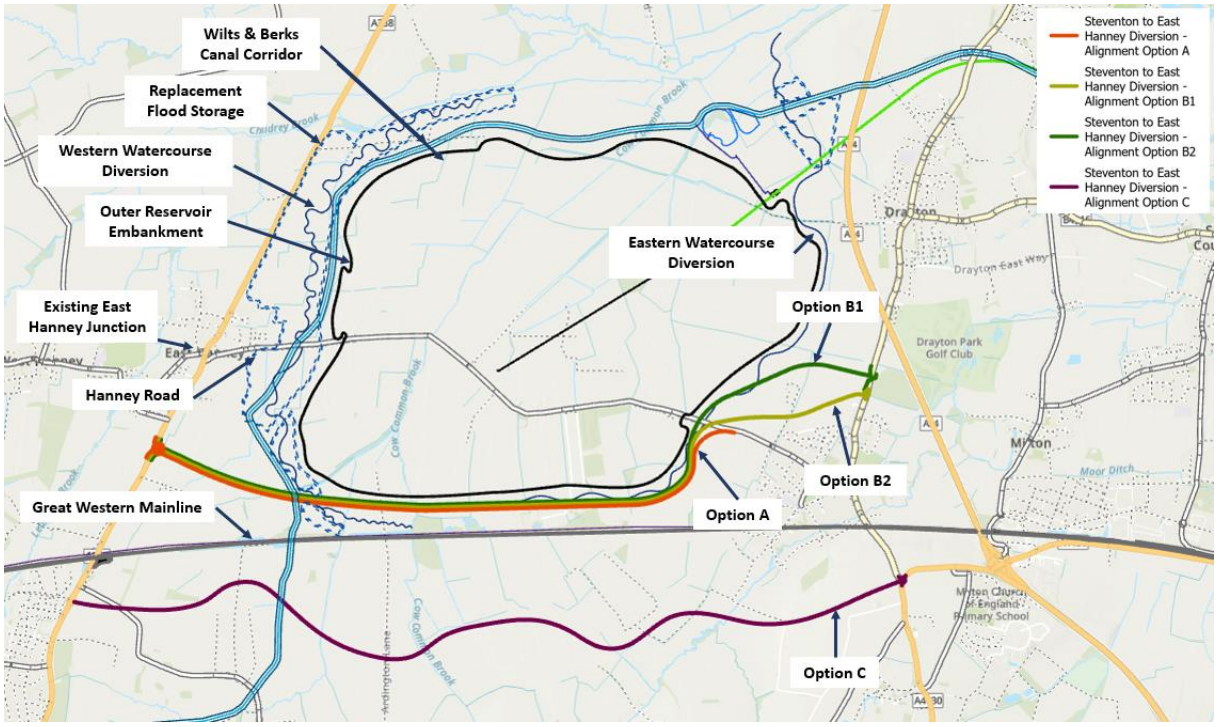
8 Steventon to East Hanney Road Diversion: Options Definition

This section presents the options developed for the Steventon to East Hanney road diversion for assessment in accordance with step 4 in the appraisal methodology.

8.1 Development of Options for the Road Diversion

8.1.1 Four alignment options were identified as shown in Figure 8.1, routing south of the reservoir embankment. All four alignment options were considered and reported in the Gate 2 submission and were brought forward for further consideration and assessment during the options appraisal process working towards the Gate 3 submission.

Figure 8.1: Steventon to East Hanney Diversion Road Options A, B1, B2 and C



Source: Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

8.1.2 The four alignment options for the Steventon to East Hanney road diversion are described below.

Alignment Option A

8.1.3 Outside of Steventon the road is diverted to the south from its current alignment from Hanney Road and then routed west along the southern extent of the reservoir embankment. Option A has a total length of approximately 5.1km.

8.1.4 At the western end of Option A, there is a new roundabout junction with the A338, which is around 800m south of the existing junction and approximately mid-way between the centre of East Hanney and the A338 bridge over the Great Western Main Line. At its eastern end, Option A uses part of the existing Hanney Road to link into Steventon as shown on Figure 8.1.

Alignment Option B1

8.1.5 Option B1 only differs from Option A at the eastern end as a new junction with the B4017 is proposed to the north of Steventon. This alignment has been included to consider the potential benefits or drawbacks of the junction location, which could reduce traffic passing through Steventon. Option B1 is routed north of the existing sub-station (see Figure 8.1) and has a total length of approximately 6.4km.

Alignment Option B2

8.1.6 Option B2 only differs from Option A at the eastern end as a new junction with the B4017 is proposed to the north of Steventon; however, Option B2 is routed south of the sub-substation (see Figure 8.1) and it is in closer proximity to existing properties. This option has a total length of approximately 6.2km.

Alignment Option C

8.1.7 Option C shifts the road diversion south of the Great Western Mainline. Option C has a total length of approximately 7.2km.

8.1.8 At the alignment's eastern end, the existing junction of the B4017 (High Street) and the A4130 would be upgraded to a roundabout due to the additional traffic that would be introduced. The eastern end of the route would require some cutting of the road into the hillside because it is relatively steep, falling approximately 30m in 800m. At the western end of the alignment the road connects into the existing roundabout on the A338 in north Grove (opposite Williams Grand Prix Engineering Ltd.).

8.1.9 Having an alignment option that crosses the Great Western Mainline has not been considered since four options have been identified for assessment that avoid crossing this mainline. A crossing over this mainline would be expected to add significant construction complexity, cost and programme, as well as impact on multiple stakeholders and introduce an interface with Network Rail. The design of a proposed crossing over the railway would be required to pass Network Rail's requirements and this would require time-consuming management, as well as carry with it a risk of proposal rejection by Network Rail that could impact on the programme.

8.2 Design Information for Option Assessments

8.2.1 Information was developed for the four alignment options on which to base the option assessments.

Common Design Aspects across the Alignment Options

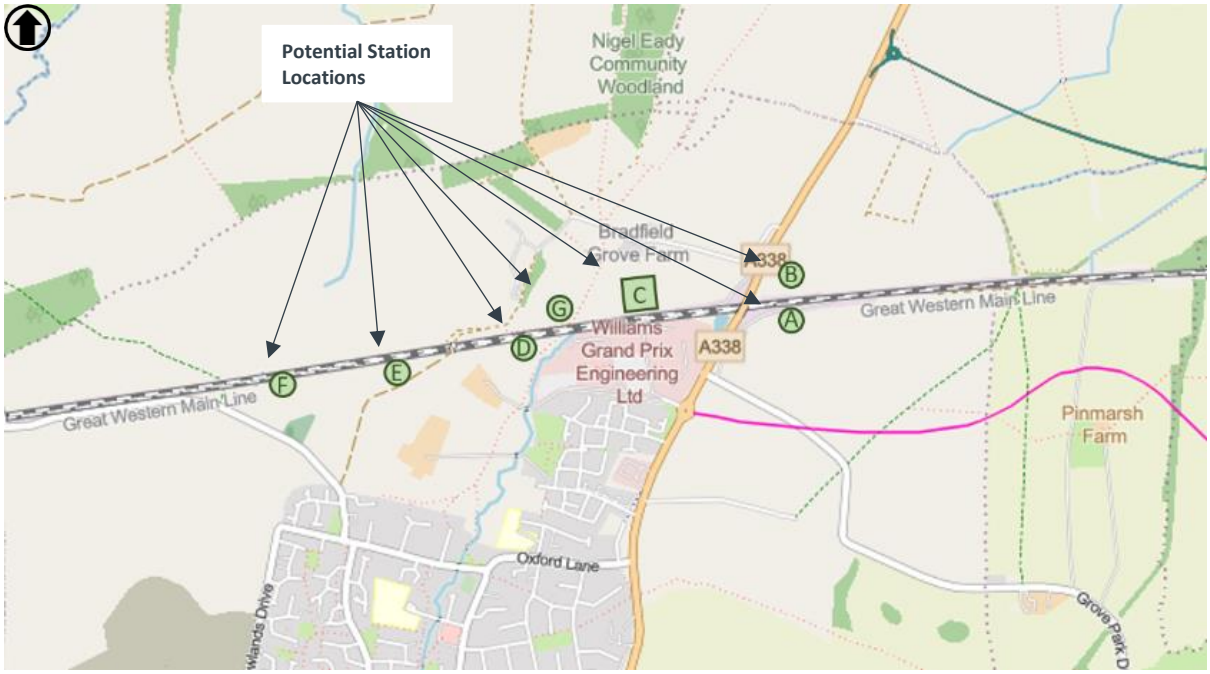
8.2.2 For the options appraisal of the Steventon to East Hanney road diversion, it was proposed that:

- The road diversion would be a rural two-lane carriageway with a width of 7.3m in accordance with the Design Manual for Roads and Bridges, and the speed limit on the road diversion would be 50mph as per the current Hanney Road.

- An approximately 2m wide footway would be provided on the north side of the road and a 3m wide shared cycle / footway would be provided on the south side of the road.
- The road diversion would be slightly raised approximately 600mm above existing ground level so that a suitable subbase material could be installed to allow the road to drain adequately; however, there may be a need to raise road levels gradually on the approach to and from watercourse crossings, where a free board is required between the changing levels of the watercourse and the bridge or culvert. This would allow watercourses to pass underneath the road diversion, including culverts to accommodate the East Hanney Ditch diversion, where relevant, as well as the Cow Common Brook and Portobello Ditch.
- The roads would not be lit along the alignment, except for approaching the junctions (roundabouts). Due to the 50mph speed limit, it is assumed that there would need to be approximately 110m of lighting leading into and out of the roundabouts. Lighting will be considered in further detail at subsequent design phases to meet OCC standards (as the local highways authority) and in balance with environmental considerations. Proposed lighting will be assessed during the construction and operational phases as part of the EIA process.
- The diversion road would need to be constructed before the existing Hanney Road is closed to maintain public access between Steventon and East Hanney. The existing road connecting Steventon to East Hanney (Hanney Road) is part of the X36 bus route, and it is assumed that this bus route would need to continue operating throughout construction of the SESRO project.

Each of the alignment options for the Steventon to East Hanney road diversion could provide connectivity to the proposed Wantage and Grove Railway Station via road. The possible station locations for the proposed Wantage and Grove Railway Station are southwest of the SESRO site as shown in Figure 8.2. Option C for the station location is marked with a square box on Figure 8.2 because it is a preferred location indicated in the policy (refer to paragraph 7.1.5).

Figure 8.2: Wantage and Grove Station Options – Wantage and Grove proposed station locations provided by OCC



Source: Esri, Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and affiliates Esri Community Maps contributors. Map player by Esri

Key Option Differences – Number of Watercourse Crossings

8.2.3 The number of watercourse crossings for each option have been counted using ArcGIS to identify where the road alignment options pass over existing and proposed watercourses. The number of watercourse crossings for each option are presented in Table 8.1.

Table 8.1: Steventon to East Hanney Diversion Road Options – Number of Watercourse Crossings

Alignment Option	Total Number of Crossings	Likely Number of Bridge Crossings
A	10	4
B1	11	5
B2	11	5
C	14	5

Source: Thames Water Internal, 2024

8.2.4 Where a crossing is expected to span a considerable distance or over a WFD principal waterbody, it is assumed that a bridge will be needed, for example, to cross the East Watercourse Diversion and West Watercourse Diversion, with culverts on all other crossings.

8.2.5 A bridge over the Wiltshire and Berkshire Canal would also be required for Options A, B1 and B2. A corridor for Wiltshire and Berkshire Canal restoration is

subject to a safeguarding policy (DP32) in the Local Plan.

8.2.6 Option C requires the most crossings, due to its longer length and because its alignment crosses more watercourses. Figures showing the locations of the anticipated crossings for each option can be seen in Appendix J.

Key Option Differences - Earthworks Quantities

8.2.7 The indicative earthworks fill volumes in Table 8.2 were informed by initial design development work to prepare for the options appraisal, which ensures that the road surface level is above the surrounding floodplain level. It is assumed that the fill volume required for the roads shall be sourced from within the SESRO site.

Table 8.2: Steventon to East Hanney Diversion Road Options - Earthworks Quantities

Alignment Option	Total Road Length (km)	Indicative Earthworks Fill volume (m^3)	Fill volume per metre (m^3/m)
A	5.1	90,460	17.7
B1	6.4	138,120	22.0
B2	6.2	111,950	18.5
C	7.2	163,500	22.9

Source: Thames Water Internal, 2024

8.2.8 Where the road options cross watercourses, water levels were taken from fluvial flood modelling of the 1 in 100year return period flood event (+70% to account for climate change). The level of the road was set 1.3m above this water level to allow for an assumed 1m thickness of the bridge deck plus a 0.3m freeboard between the water level and the underside of the bridge.

8.2.9 Option C requires the greatest fill volume per metre length, this is due to the greater number of crossings required for this option, where each crossing requires fill to enable the road to slope up to, and down from, the crossing to provide the clearance as described previously.

9 Steventon to East Hanney Road Diversion: Option Assessments

This section summarises the option assessments undertaken for the Steventon to East Hanney road diversion in accordance with step 5 of the appraisal methodology. The section starts by outlining the assumptions taken in the assessments, before individually summarising the performance of each alignment option when assessed.

9.1 Assessment Assumptions

9.1.1 This section sets out the assumptions used in the assessment of road alignment options, but section 1.3 earlier in this report outlines the backchecking planned for the options appraisals work.

Engineering Assessment Assumptions

9.1.2 The engineering assessment was considered in two themes: Construction and Operation. The following assumptions informed the assessment:

- For the assessment of the access road options it has been assumed that crossings of existing watercourses shall be accomplished via culverts, unless the crossing must go over a large watercourse or principal WFD water body, such as the future corridor for the Wiltshire and Berkshire Canal or the East/West Watercourse Diversion, in which case a bridge would be required.
- There are watercourse diversions to the east and west of the SESRO site to pick up the flows of existing watercourse systems in the area that already broadly flow west and east. It is assumed that the eastern watercourse diversion and western watercourse diversion around the SESRO site are as per the Gate 2 alignment. To the east of the routes, options A, B1 and B2 cross the proposed east watercourse diversions. Although it may be possible to reroute the eastern watercourse diversion to avoid the need for a crossing with the road options, the watercourse route is assumed to be as per the Gate 2 alignment for the assessment of the options.
- The Design Manual for Roads and Bridges was used to determine the embankment and longitudinal gradients of the diversion road options. Concept design work was undertaken to establish the volume required for earthwork embankments, using LiDAR data downloaded from Defra[22].
- For each road option, the number of utilities impacted upon was identified considering utility information obtained in April 2022 for 11kV, 33kV and 132kV overhead electricity lines, intermediate pressure gas pipelines and a potable watertrunk main. It has been assumed that diversion of these utilities can be undertaken. Initial discussions regarding electricity diversions have been undertaken with the Distribution Network Operator (DNO), but detailed discussions will need to be held as any electricity diversion designs are

[22] Defra Survey Data Download is available online at: https://environment.data.gov.uk/survey

developed and providers. Discussions will also be undertaken with the providers for the other affected utilities.

Cost and Carbon Assessment Assumptions

9.1.3 Capital cost and carbon for each option were derived using the approach outlined in the Gate 2 reports. Some aspects of the cost and carbon build-ups needed to be updated or added. Quantities were estimated to reflect the differences between options. Where available, benchmarked unit cost rates from Gate 2 were used, and where these were not available new rates were developed. Emissions factor rates were identified for key items from Civil Engineering Standard Method of Measurement (CESMM4).

Environmental Assessment Assumptions

9.1.4 A number of topics for the environmental assessment were considered individually. The following assumptions informed the assessment:

9.1.5 Biodiversity and Nature Conservation

- It was assumed that the Ancient Woodland Inventory and Ancient Tree Inventory was correct and comprehensive at the time of the optioneering process (summer 2023). The latter will need to be confirmed once land access is available and surveys can be carried out to confirm the desktop data.
- The assessment of habitats to be impacted was undertaken using aerial imagery and UK Habitat information collected for Gate 2, the latter of which was collected using desk study information and aerial imagery and has not been fully ground truthed.
- There will be no direct or indirect impacts to The Cuttings and Hutchin's Copse LWS as a result of the road construction as the proposed road diversion is 60m from the LWS.
- Existing gaps and access points within landscape features will be used where feasible to minimise vegetation clearance.

9.1.6 Historic Environment

- The existing publicly available data regarding buried archaeology is not complete and is subject to further desk study and non-intrusive and intrusive surveys to understand the presence, extent and value of buried remains.

9.1.7 Land Quality

- Data provided by third parties including historical maps to undertake these assessments are accurate.

9.1.8 Landscape and Visual

- Some lighting would be required during construction for occasional night-time working, most likely at the tie-in with existing roads.
- Lighting would be required for the operational road junctions to ensure the safety of drivers, cyclists and walkers. As the type of lighting is not known at

this stage, it is assumed that this could be lighting columns as a worst-case scenario.

- Similar mitigation seeding and planting to that proposed for the Gate 2 design could be implemented for all options.

9.1.9 Noise

- Noise emissions for construction activities (including traffic movements and main construction types / numbers) are based on Gate 2 assumptions, with updates made following a review by the SESRO construction advisor as required.
- Property counts do not consider the screening of receptors by nearby buildings (i.e. noise screening for the second row of properties is not considered due to the presence of the first row of properties).

9.1.10 Aquatic Environment

- On each of the crossings of the principal WFD watercourses we assume the use of clear span bridges to reduce potential impacts. On each of the other crossings it is assumed that appropriately sized box culverts are used.

Community, Planning and Land Performance Assessment Assumptions

9.1.11 The assessment assumptions with regard to the road design and alignment are as set out in the engineering section, above.

9.1.12 All PRoW severed by the development will be re-routed / reinstated.

9.1.13 A key assumption in the case of each road option is that construction of the SESRO embankment and potentially also the rail siding will require land-take and disruption to, or relocation of, businesses at the Steventon Business Park south of Hanney Road in any event, so this is not an additional impact of the road diversion and does not distinguish the road diversion options.

9.1.14 All property and land assessments have been undertaken from a desktop review and data should be confirmed where necessary through land access and surveys, when and where possible.

9.1.15 During the property and land assessments, assets have been categorised based on clusters. For example, based on desktop studies involving publicly available information, including visual inspection and mapping resources, it may be assumed that a single business operates from multiple buildings. However, it is recognised that this must be confirmed when it is possible to contact relevant stakeholders.

9.2 Alignment Option A

9.2.1 This section summarises the performance of Option A considering the appraisal themes and subthemes. For full details of the assessment of Option A against individual criteria, refer to Appendix E. The alignment of Option A is shown in Figure 8.1.

Engineering (Constructability) Performance

9.2.2 Option A performs well against the health and safety criterion because it is 5.1km long and requires 10 crossings, so it is judged to have to have low safety risk of endangering construction workers or members of the public during construction.

9.2.3 For Option A, disruption to the existing road network during enabling works and construction is judged likely to be moderate because materials for road construction will be delivered to site via the reservoir access road, which is likely to cause moderate disruption on the A415 given the average number of HGVs per day is approximately 20.

9.2.4 Option A is 5.1km in length. There are minimal service diversions and no major services to cross. Option A therefore performs well for the programme duration and risk criteria and the construction complexity subtheme.

9.2.5 Considering logistics, it is assumed that the earthworks required for the road embankment (approximately 17.7m^3/m) will be sourced from the SESRO site and while the road requires import of materials for the road surface, it is assumed that access for construction of Option A is available using the SESRO main access road. This import using the SESRO main access road would however increase vehicle movements through the SESRO site. There are also likely to be some space constraints for construction and material storage between the existing railway embankment and the reservoir embankment.

Engineering (Operability) Performance

9.2.6 The health and safety criteria during operation considers the risk of endangering operational staff, visitors or members of the public, and also whether access/egress can be provided during normal operations and emergencies. Option A performs well there are no operational activities identified that would require enhanced control measures for safe operation, and it is judged that access/egress can be provided.

9.2.7 Option A performs well against the operational complexity criterion because it is judged that the majority of maintenance activities could be undertaken during limited closure periods and/or with limited disruption.

9.2.8 While Option A is a new highway, it connects to the existing Hanney Road so makes use of the existing road network to an extent. Considering operational reliability, flood damage to Option A is not considered to be a significant risk and it is assumed that other east-west routes could be used (such as the A417 or A415) if Option A were out of operation.

9.2.9 Considering its adaptability during operation, Option A creates a direct link between East Hanney and Steventon with footway and cycle facilities. While Option A is located within an area of the SESRO site that could have been used for increased social and recreational infrastructure, Option A maintains the road and public transport link between the villages and provide access to recreational facilities at the SESRO site. Option A could provide improved connectivity to the reservoir by introducing bus stops along the new road adjacent to proposed walking and cycling routes in and around the reservoir.

9.2.10 From a transport planning perspective, disruption to the existing road network during the operation of Option A is likely to be limited with visitor traffic to the reservoir encouraged to use the SESRO main access road, although Option A may increase journey times for those travelling between Steventon to East Hanney. Initial traffic modelling of the junction suggests that the capacity at the junction for Option A is acceptable. It is noted that the junction location of Option A has potential to positively impact on traffic within East Hanney and could also help better serve a potential new Wantage and Grove Railway station than the current location of the Steventon/Hanney road junction with the A338.

Cost and Carbon Performance

9.2.11 Initial high-level cost estimates indicate that the range in costs for the SESRO main Access road options represents approximately 1.2% of the total SESRO costs. Option A results in a total project cost that is the lowest cost option of the four in this appraisal.

9.2.12 Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option A is the lowest carbon option.

Environmental Performance

9.2.13 Option A performs well against the air quality criteria because it is located 4km away from Marcham AQMA, construction impacts would be mitigated by standard controls and operational emissions are expected to be minimal.

9.2.14 For the aquatic environment subtheme, Option A has no interactions with sensitive groundwater SPZ. There is also no risk identified of WFD deterioration associated with Option A but there are moderate adverse effects predicted for Option A on the aquatic environment due to the western watercourse diversion crossing and multiple crossings on smaller watercourses all within the Cow Common Brook WFD waterbody and Childrey Brook and Norbrook at Common Barn WFD waterbody. Any impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately. There is also a risk posed to the eastern and western watercourse diversion design and route.

9.2.15 Option A performs well against much of the biodiversity and nature conservation criteria as none of the following designated sites were identified within the boundary of, or in proximity to, Option A: SAC, SPA, Ramsar site, SSSI, NNR and LNR. However, priority habitats, such as hedgerow, will require removal for the construction of Option A. Desk study of Natural England's Ancient Woodland Inventory and historical maps indicates that no ancient woodland (considered to be irreplaceable habitat) would be affected. Priority habitat mapping indicates that Option A may cross wood pasture and parkland; however, historic mapping from 1937 to 1961 and recent aerial imagery indicate that this area has not been wooded since at least the mid-twentieth century. Desk study of the Woodland Trust's Ancient Tree Inventory indicates that no ancient or veteran trees (also considered to be irreplaceable habitat) are located close to Option A; however, survey may potentially identify trees that

could be classified as ancient or veteran trees. It is noted that broadleaved deciduous woodland of high ecological value within The Cuttings and Hutchin's Copse LWS lies close by to the south of Option A.

9.2.16 The construction of Option A may require the removal of vegetation belts and some woodland belts. It is assumed that the woodland is likely to include high quality trees.

9.2.17 Option A has no predicted impacts on pluvial or groundwater flood risk, and although Option A is partially routed through areas of fluvial flooding, loss of fluvial flood storage within Flood zones 2 and 3 can be mitigated by creating replacement flood storage along the watercourse diversions.

9.2.18 Option A performs well against several of the historic environment criteria because the permanent infrastructure is more than 500m, and the construction area more than 100m, from the following designated heritage assets: scheduled monuments, registered parks and gardens, registered battlefields, and world heritage sites. However, Option A would require the removal and relocation of a Grade II listed milestone on the A338, and it lies approximately 300m from the East Hanney conservation area. Option A also crosses cropmark complexes and the Wiltshire-Berkshire canal.

9.2.19 Considering the land subtheme, Option A intersects Steventon Depot and the infilled Berkshire-Wiltshire Canal, which could present potential sources of contamination. There is also potential for disturbance of UXO because an early 20th century rifle range was in use in the area of Option A and Option A intersects Steventon Depot, which has a military history. There are, however, no authorised or historical landfills within 250m of Option A.

9.2.20 Considering potential landscape and visual impacts, the traffic and highway infrastructure for Option A is likely to have a significant effect upon local landscape character and tranquillity by interrupting the medium to large scale field pattern divided by hedgerows and woodland belts. In addition, traffic and highway infrastructure would be visible from some PRoWs and residential properties. The landscape character and tranquillity of the National Landscape is also likely to be affected by the introduction of traffic and highway infrastructure for Option A and would be visible in some panoramic views from The Ridgeway National Trail, although the effect on such panoramic views could be mitigated in the long term to ensure it would be similar to the existing Steventon/Hanney Road that it replaces. Lighting during occasional night-time construction works would also lead to changes in visual amenity. Overall, therefore, the effect on local views of sensitive visual receptors is likely to be significant.

9.2.21 Option A performs poorly against the noise criteria for both construction and operation because the closest noise sensitive property is located approximately 30m from Option A and there is another property within the ‘red band’, resulting in potentially significant effects which would be difficult to mitigate. Further detail is provided in Appendix E.

9.2.22 Option A performs well against the pollution criteria, considering potential impacts associated with discharges during construction and operation, because

standard controls during construction and operation are likely to avoid significant effects.

Community, Planning and Land Performance

9.2.23 Considering potential socio-economic impacts, Option A is approximately 50m from the nearest property and its construction may cause closures or disruption on the A338 and Hanney Road and result in the severance of multiple PRoWs that users potentially use to access green spaces. Option A may also hinder access to the reservoir and planned restoration of the Berkshire-Wiltshire Canal path although, if access is maintained or improved, then this will allow additional recreational benefits.

9.2.24 Option A performs well against much of the consenting criteria because, for example, it is not located within specifically designated areas, such as Green Belt, National Landscape, Common Land, Open Space and minerals safeguarding areas. Option A also requires minimum Order Limit Extents.

9.2.25 From a transport planning perspective, Option A retains the East Hanney to Steventon connection, retaining the route through Steventon but moving the route to the south of East Hanney. Option A therefore allows traffic to continue through Steventon, keeping existing footfall and so not adversely impacting on local income. Option A offers the fewest changes to the existing route between the towns (East Hanney and Steventon), providing benefit to bus operators and users. Option A also provides a route for non-motorised users between key destinations, including the provision of pedestrian and cycle facilities in the form of a shared route.

9.2.26 For property and land acquisition, Option A would go through agricultural land and part of the storage depot, but as it is likely that the whole of the depot will be acquired for the footprint and construction of the reservoir, this is not considered within this options appraisal. Option A retains the existing route through the Steventon. There are no identified owners of SCL affected by Option A but the Church Commissioners for England, a statutory landowner, is affected by Option A, which may represent a delivery risk.

9.3 Alignment Option B1

9.3.1 This section summarises the performance of Option B1 considering the appraisal themes and subthemes. For full details of the assessment of Option B1 against individual criteria, refer to Appendix F. The alignment of Option B1 is shown in Figure 8.1.

Engineering (Constructability) Performance

9.3.2 Option B1 is 6.4km long, and it requires 11 crossings, work under existing overhead HV cables and potentially additional HV cable diversion. From a health and safety perspective, this would increase the safety risk for construction workers and require enhanced control measures.

9.3.3 For Option B1, disruption to the existing road network during enabling works and construction is judged likely to be moderate because materials for road

construction will be delivered to site via the reservoir access road, which is likely to cause moderate disruption on the A415 given the average number of HGVs per day is approximately 20.

9.3.4 For Option B1, it is likely that overhead HV lines and a water main require diversion. Therefore, for the subthemes of programme and construction complexity, Option B1 does not perform as well against all the criteria in these subthemes. Full details are provided in Appendix F for the assessment against individual criteria.

9.3.5 Considering logistics, it is assumed that the earthworks required for the road embankment (approximately 138,121m^3) will be sourced from the SESRO site and while the road requires import of materials for the road surface, it is assumed that access for construction of Option A is available using the SESRO main access road. This import using the SESRO main access road would however increase vehicle movements through the SESRO site. There are also likely to be some space constraints for construction and material storage between the existing railway embankment and the reservoir embankment when considering space required for utility diversions.

Engineering (Operability) Performance

9.3.6 The health and safety criteria during operation considers the risk of endangering operational staff, visitors or members of the public, and also whether access/egress can be provided during normal operations and emergencies. Option B1 performs well there are no operational activities identified that would require enhanced control measures for safe operation, and it is judged that access/egress can be provided.

9.3.7 Option B1 performs well against the operational complexity criterion because it is judged that the majority of maintenance activities could be undertaken during limited closure periods and/or with limited disruption.

9.3.8 Option B1 is a new highway and does not connect to the existing Hanney Road. Considering its operational reliability, flood damage to Option B1 is not considered to be a significant risk and it is assumed that other east-west routes could be used (such as the A417 or A415) if Option B1 were out of operation.

9.3.9 Considering its adaptability during operation, Option B1 creates a direct link between East Hanney and Steventon with footway and cycle facilities. While Option B1 is located within an area of the SESRO site that could have been used for increased social and recreational infrastructure, Option B1 maintains the road link between the villages for public transport and provides an opportunity for a bus route to help provide improved access to recreational facilities at the SESRO site.

9.3.10 From a transport planning perspective, disruption to the existing road network during the operation of Option B1 is likely to be limited with visitor traffic to the reservoir encouraged to use the SESRO main access road, although Option B1 may increase journey times for those travelling between Steventon to East Hanney. Initial traffic modelling of the junction suggests that the capacity at the junction for Option B1 is acceptable.

Cost and Carbon Performance

9.3.11 Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 1.2% of the total SESRO costs. Option B1 results in a total project cost of approximately 0.6% less than the lowest cost option.

9.3.12 Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option B1 results in a total project carbon of 0.3% more than the lowest carbon option.

Environmental Performance

9.3.13 Option B1 performs well against the air quality criteria because it is located over 3km away from Marcham AQMA, construction impacts would be mitigated by standard controls and operational emissions are expected to be minimal.

9.3.14 For the aquatic environment subtheme, Option B1 has no interactions with sensitive groundwater SPZ. There is also no risk identified of WFD deterioration associated with Option B1 but there are moderate adverse effects predicted for Option B1 on the aquatic environment due to the western watercourse diversion crossing and multiple crossings on smaller watercourses within the Cow Common Brook WFD waterbody and Childrey Brook and Norbrook at Common Barn WFD waterbody. Any impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately. There is also a risk posed to the eastern and western watercourse diversion design and route.

9.3.15 Option B1 performs well against much of the biodiversity and nature conservation criteria as none of the following designated sites were identified within the boundary of, or in proximity to, Option B1: SAC, SPA, Ramsar site, SSSI, NNR and LNR. However, priority habitats, such as hedgerow, will require removal for the construction of Option B1. Desk study of Natural England's Ancient Woodland Inventory and historical maps indicates that no ancient woodland (considered to be irreplaceable habitat) would be affected. Priority habitat mapping indicates that Option B1 may cross wood pasture and parkland; however, historic mapping from 1937 to 1961 and recent aerial imagery indicate that this area has not been wooded since at least the mid-twentieth century. Desk study of the Woodland Trust's Ancient Tree Inventory indicates that no ancient or veteran trees (also considered to be irreplaceable habitat) are located close to Option B1; however, survey may potentially identify trees that could be classified as ancient or veteran trees. It is noted that broadleaved deciduous woodland of high ecological value within The Cuttings and Hutchin's Copse LWS lies close by to the south of Option B1.

9.3.16 The construction of Option B1 may require the removal of vegetation belts and some woodland belts. It is assumed that the woodland is likely to include high quality trees.

9.3.17 Option B1 has no predicted impacts on pluvial or groundwater flood risk, and although Option B1 is partially routed through areas of fluvial flooding, loss of

fluvial flood storage within Flood zones 2 and 3 can be mitigated by creating replacement flood storage along the watercourse diversions.

9.3.18 Option B1 performs well against several of the historic environment criteria because the permanent infrastructure is more than 500m, and the construction area more than 100m, from the following designated heritage assets: scheduled monuments, registered parks and gardens, registered battlefields, and world heritage sites. However, Option B1 would require the removal and relocation of a Grade II listed milestone on the A338, and it also lies within 500m of the East Hanney and Steventon conservation areas. Option B1 also crosses cropmark complexes and the Wiltshire-Berkshire canal.

9.3.19 Considering the land subtheme, Option B1 intersects Steventon Depot and the infilled Berkshire-Wiltshire Canal, which could present potential sources of contamination. There is also potential for disturbance of UXO because an early 20th century rifle range was in use in the area of Option B1 and Option B1 intersects Steventon Depot, which has a military history. There are, however, no authorised or historical landfills within 250m of Option B1.

9.3.20 Considering potential landscape and visual impacts, the traffic and highway infrastructure of Option B1 is likely to have a significant effect upon local landscape character and tranquillity by interrupting the medium to large scale field pattern divided by hedgerows and woodland belts. In addition, traffic and highway infrastructure would be visible from some PRoWs and residential properties. The landscape character and tranquillity of the National Landscape is likely to be affected by the introduction of traffic and highway infrastructure for Option B1 and would be visible in some panoramic views from The Ridgeway National Trail, although the effect on such panoramic views could be mitigated in the long term to ensure it would be similar to the existing Steventon/Hanney Road it replaces. The visual amenity of Steventon would also be affected by Option B1. Overall, therefore, the effect on local views of sensitive visual receptors is likely to be significant.

9.3.21 Option B1 performs poorly against the criterion for construction noise because of its proximity to a noise sensitive property, with a further five properties within the ‘red band’ and a further five within the ‘amber band’ as set out in Appendix F. It is judged that there may be potential significant effects as a result of operation road traffic noise, but they are likely to be mitigated if they occur.

9.3.22 Option B1 also performs well against the pollution criteria, considering potential impacts associated with discharges during construction and operation, because standard controls during construction and operation are likely to avoid significant effects.

Community, Planning and Land Performance

9.3.23 Considering potential socio-economic impacts, Option B1 is approximately 50m from the nearest property and its construction may cause closures or disruption on the A338 and Hanney Road and result in the severance of multiple PRoW that users potentially use to access green spaces. Option B1 may also hinder access to the reservoir and planned restoration of the Berkshire-Wiltshire Canal,

although if access is maintained or improved then this will allow additional recreational benefits.

9.3.24 Option B1 performs well against much of the consenting criteria because, for example, it is not located within specifically designated areas, such as Green Belt, National Landscape, Common Land, Open Space and minerals safeguarding areas. Option B1 also requires minimum Order Limit extents.

9.3.25 From a transport planning perspective, Option B1 moves the route north of Steventon and to the south of East Hanney. It therefore takes traffic away from Steventon, which may impact existing footfall and local income, and the changes to the existing route between the towns would affect bus operators and users. Option B1 provides a good route for non-motorised users between key destinations, including the provision of pedestrian and cycle facilities in the form of a shared route.

9.3.26 For property and land acquisition, Option B1 would go through agricultural land and part of the storage depot, but as the whole of the depot will have to be acquired because access to the part not required for the footprint of the reservoir will be taken away, this is not considered within this options appraisal. In addition, it is likely that the whole of the Depot area will be required for construction. There are no identified owners of SCL affected by Option B1 but the Church commissioners for England, a statutory landowner, is affected by Option B1, which may represent a delivery risk.

9.4 Alignment Road Option B2

9.4.1 This section summarises the performance of Option B2 considering the appraisal themes and subthemes. For full details of the assessment of Option B2 against individual criteria, refer to Appendix G. The alignment of Option B2 is shown in Figure 8.1.

Engineering (Constructability) Performance

9.4.2 Option B2 is 6.2km long and requires 11 crossings. It is judged that the works could be constructed safely but would require enhanced control measures to manage safety risks because work would be required under existing overhead HV cables and would be close to a water pumping station.

9.4.3 For Option B2, disruption to the existing road network during enabling works and construction is judged likely to be moderate because materials for road construction will be delivered to site via the reservoir access road, which is likely to cause moderate disruption on the A415 given the average number of HGVs per day is approximately 20.

9.4.4 For Option B2, it is likely that overhead HV lines and a water main require diversion. Therefore, for the subthemes of programme and construction complexity, Option B2 does not perform as well against all the criteria in these subthemes. Full details are provided in Appendix G for the assessment against individual criteria.

9.4.5 Considering logistics, it is assumed that the earthworks required for the road embankment (approximately 111,948m^3) will be sourced from the SESRO site

and while the road requires import of materials for the road surface, it is assumed that access for construction of Option A is available using the SESRO main access road. This import using the SESRO main access road would however increase vehicle movements through the SESRO site. There are also likely to be some space constraints for construction and material storage between the existing railway embankment and the reservoir embankment when considering space required for utility diversions.

Engineering (Operability) Performance

9.4.6 The health and safety criteria during operation considers the risk of endangering operational staff, visitors or members of the public, and also whether access/egress can be provided during normal operations and emergencies. Option B2 performs well there are no operational activities identified that would require enhanced control measures for safe operation, and it is judged that access/egress can be provided.

9.4.7 Option B2 performs well against the operational complexity criterion because it is judged that the majority of maintenance activities could be undertaken during limited closure periods and/or with limited disruption.

9.4.8 Option B2 is a new highway and does not connect to the existing Hanney Road. Considering its operational reliability, flood damage to Option B2 is not considered to be a significant risk and it is assumed that other east-west routes could be used (such as the A417 or A415) if Option B2 were out of operation.

9.4.9 Considering its adaptability during operation, Option B2 creates a direct link between East Hanney and Steventon with footway and cycle facilities. While Option B2 is located within an area of the SESRO site that could have been used for increased social and recreational infrastructure, Option B2 maintains the road link between the villages for public transport and provides an opportunity for a bus route to help provide improved access to recreational facilities at the SESRO site.

9.4.10 From a transport planning perspective, disruption to the existing road network during the operation of Option B2 is likely to be limited with visitor traffic to the reservoir encouraged to use the SESRO main access road, although Option B2 may increase journey times for those travelling between Steventon to East Hanney. Initial traffic modelling of the junction suggests that the capacity at the junction for Option B2 is acceptable.

Cost and Carbon Performance

9.4.11 Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 1.2% of the total SESRO costs. Option B2 results in a total project cost of approximately 0.5% more than the lowest cost option.

9.4.12 Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option B2 results in a total project carbon of 0.2% more than the lowest carbon option.

Environmental Performance

9.4.13 Option B2 performs well against the air quality criteria because it is located 4km away from Marcham AQMA, construction impacts would be mitigated by standard controls and operational emissions are expected to be minimal.

9.4.14 For the aquatic environment subtheme, Option B2 has no interactions with sensitive groundwater SPZ. There is also no risk identified of WFD deterioration associated with Option B2 but there are moderate adverse effects predicted for Option B2 on the aquatic environment due to western watercourse diversion crossing and multiple crossings on smaller watercourses within the Cow Common Brook WFD waterbody and Childrey Brook and Norbrook at Common Barn WFD waterbody. Any impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately. There is also a risk posed to the eastern and western watercourse diversion design and route due to space constraints.

9.4.15 Option B2 performs well against much of the biodiversity and nature conservation criteria as none of the following designated sites were identified within the boundary of, or in proximity to, Option B2: SAC, SPA, Ramsar site, SSSI, NNR and LNR. However, priority habitats, such hedgerows, will require removal for the construction of Option B2. Desk study of Natural England's Ancient Woodland Inventory and historical maps indicates that no ancient woodland (considered to be irreplaceable habitat) would be affected. Priority habitat mapping indicates that Option B2 may cross wood pasture and parkland; however, historic mapping from 1937 to 1961 and recent aerial imagery indicate that this area has not been wooded since at least the mid-twentieth century. Desk study of the Woodland Trust's Ancient Tree Inventory indicates that no ancient or veteran trees (also considered to be irreplaceable habitat) are located close to Option B2; however, survey may potentially identify trees that could be classified as ancient or veteran trees. It is noted that broadleaved deciduous woodland of high ecological value within The Cuttings and Hutchin's Copse LWS lies close by to the south of Option B2.

9.4.16 The construction of Option B2 may require the removal of vegetation belts and some woodland belts. It is assumed that woodland is likely to include high quality trees.

9.4.17 Option B2 has no predicted impacts on pluvial or groundwater flood risk, and although Option B2 is partially routed through areas of fluvial flooding, loss of fluvial flood storage within Flood zones 2 and 3 can be mitigated by creating replacement flood storage along the watercourse diversions.

9.4.18 Option B2 performs well against several of the historic environment criteria because the permanent infrastructure is more than 500m, and the construction area more than 100m, from the following designated heritage assets: scheduled monuments, registered parks and gardens, registered battlefields and world heritage sites. However, the nearest listed building in Steventon is less than 500m from the option alignment and the East Hanney and Steventon conservation areas also lie within 500m from Option B2. The route of Option B2 also crosses cropmark complexes and the Wiltshire-Berkshire canal.

9.4.19 Considering the land subtheme, Option B2 intersects Steventon Depot and the infilled Berkshire-Wiltshire Canal, which could present potential sources of contamination. There is also potential for disturbance of UXO because an early 20th century rifle range was in use in the area of Option B2 and Option B2 intersects Steventon Depot, which has a military history. There are, however, no authorised or historical landfills within 250m of Option B2.

9.4.20 Considering potential landscape and visual impacts, the traffic and highway infrastructure for Option B2 is likely to have a significant effect upon local landscape character and tranquillity by interrupting the medium to large scale field pattern divided by hedgerows and woodland belts. In addition, traffic and highway infrastructure would be visible from some PRoW and residential properties. The landscape character and tranquillity of the National Landscape is likely to be affected by the introduction of traffic and highway infrastructure for Option B2 and would be visible in some panoramic views from The Ridgeway National Trail, although the effect on such panoramic views could be mitigated in the long term to ensure it would be similar to the existing Steventon/Hanney Road it replaces. The visual amenity of Steventon would also be affected by Option B2. Overall, therefore, the effect on local views of sensitive visual receptors is likely to be significant.

9.4.21 Option B2 performs poorly against the noise criteria both construction and operation because of its proximity to a noise sensitive property with a further five properties within the 'red band' and a further four within the 'amber band' as defined in Appendix G.

9.4.22 Option B2 also performs well against the pollution criteria, considering potential impacts associated with discharges during construction and operation, because standard controls during construction and operation are likely to avoid significant effects.

Community, Planning and Land Performance

9.4.23 Considering potential socio-economic impacts, Option B2 is approximately 50m from the nearest property and its construction may cause closures or disruption on the A338 and Hanney Road and result in the severance of multiple PRoW likely used by the community to access green spaces. Option B2 may also hinder access to the reservoir and planned restoration of the Berkshire-Wiltshire Canal path, although if access is maintained or improved then this will allow additional recreational benefits.

9.4.24 Option B2 performs well against much of the consenting criteria because, for example, it is not located within specifically designated areas, such as Green Belt, National Landscape, Common Land, Open Space and minerals safeguarding areas. Option B2 also requires minimum Order Limit Extents. However, Option B2 has multiple complex interfaces, including interactions with overhead lines and water.

9.4.25 From a transport planning perspective, Option B2 moves the route north of Steventon and to the south of East Hanney. It therefore takes traffic away from Steventon, which may impact existing footfall and local income, and the

changes to the existing route between the towns would affect bus operators and users. Option B2 provides a good route for non-motorised users between key destinations, including the provision of pedestrian and cycle facilities in the form of a shared route.

9.4.26 For property and land acquisition, Option B1 would go through agricultural land and part of the storage depot, but as the whole of the depot will have to be acquired because access to the part not required for the footprint of the reservoir will be taken away, this is not considered within this options appraisal. In addition, it is likely that the whole of the Depot area will be required for construction. There are no identified owners of SCL affected by Option B2 but the Church commissioners for England, a statutory landowner, is affected by Option B2, which may represent a delivery risk. Option B2 would route relatively close to residential properties.

9.5 Alignment Option C

9.5.1 This section summarises the performance of Option C considering the appraisal themes and subthemes. For full details of the assessment of Option C against individual criteria, refer to Appendix H. The alignment of Option C is shown in Figure 8.1.

Engineering (Constructability) Performance

9.5.2 Option C is 7.1km long and requires 14 crossings. It is judged that the works could be constructed safely but would require enhanced control measures to manage safety risks because work would be required under existing overhead HV cables, there may be additional HV cable diversions and Option C is likely to result in increased vehicle movements on the existing road network.

9.5.3 Considering third party impact, Option C is a new construction away from the existing road network and likely to affect local access tracks or minor roads, so disruption is likely to be significant. Option C also requires land that is outside of the SESRO main works site boundary so additional land not already affected by the reservoir construction.

9.5.4 Option C has a length of approximately 7.1km, requiring approximately 163,500m^3 of fill material, 14 crossings and five bridges, as well as number of additional landowners. Therefore, for the subthemes of programme and construction complexity, Option C does not perform as well against all the criteria in these subthemes. There is also the potential loss in main site efficiency since Option C is not located within the SESRO main site works boundary, potentially affecting programme duration. Full details are provided in Appendix G for the assessment against individual criteria.

9.5.5 There are logistical challenges identified for Option C because it does not lie within the SESRO main works site boundary, for example a method of access separate to the SESRO main access road would be required to construct Option C. The earthworks required for the road embankment (estimated as 16,349m^3) would need to be sourced from either side of the road for Option C. If earthworks need to be transported from the SESRO main site for Option C, this material would need to be transferred south of the railway, most likely via the

A415 and A338.

Engineering (Operability) Performance

9.5.6 The health and safety criteria during operation considers the risk of endangering operational staff, visitors or members of the public, and also whether access/egress can be provided during normal operations and emergencies. Option C performs well there are no operational activities identified that would require enhanced control measures for safe operation, and it is judged that access/egress can be provided.

9.5.7 Option C performs well against the operational complexity criterion because it is judged that the majority of maintenance activities could be undertaken during limited closure periods and/or with limited disruption.

9.5.8 Option C is a new highway and does not connect to the existing Hanney Road, so Option C makes no use of existing assets. Considering its operational reliability, flood damage to Option C is not considered to be a significant risk and it is assumed that other east-west routes could be used (such as the A417 or A415) if Option C were out of operation.

9.5.9 Option C does not perform well against the resilience criteria focusing on adaptability. Option C is located outside of the SESRO site so does not remove space there, which could be used for increased social and recreational infrastructure; however, access to this infrastructure would be restricted because there would be no bus route available close to the reservoir given that Option C would not provide a direct link to the SESRO site, which could be used for bus / pedestrian / cycle / horse riding access to the reservoir. Option C would not offer the opportunity to provide public transport close to the reservoir; for example, it lacks the potential to provide direct access to the reservoir walking paths via public transport by providing bus stops close to the reservoir. There is therefore limited flexibility for future modifications related to reservoir usage.

9.5.10 From a transport planning perspective, disruption to the existing road network during the operation of Option C is likely to be significant. Option C moves the east-west route away from Steventon and East Hanney to Grove and the Milton Interchange/Didcot, so it is likely to have an impact on the wider road network and existing junctions. Since Option C deviates significantly from the existing road, it would increase the journey distance and traffic time for road users travelling between Steventon and East Hanney and also adversely impact the existing bus route between the two population centres.

Cost and Carbon Performance

9.5.11 Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 1.2% of the total SESRO costs. Option A results in a total project cost of approximately 1.2% more than the lowest cost option.

9.5.12 Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total

SESRO carbon. Option C results in a total project carbon of 0.5% more than the lowest carbon option.

Environmental Performance

9.5.13 Option C performs well against the air quality criteria because it is located over 6km away from Marcham AQMA, construction impacts would be mitigated by standard controls and operational emissions are expected to be minimal.

9.5.14 For the aquatic environment subtheme, Option C has no interactions with sensitive groundwater SPZ. There is also no risk identified of WFD deterioration associated with Option C but there are moderate adverse effects predicted for Option C on the aquatic environment due to Ginge Brook WFD principal waterbody and Cow Common Brook Principal waterbody crossings and multiple crossings on smaller watercourses and tributaries within these waterbodies. Any impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately. Due to the location south of the Great Western Mainline, Option C would provide more space for the eastern watercourse diversion to the south of the reservoir.

9.5.15 Option C performs well against much of the biodiversity and nature conservation criteria as none of the following designated sites were identified within the boundary of, or in proximity to, Option C: SAC, SPA, Ramsar site, SSSI, NNR and LNR. However, priority habitats, such as deciduous woodland and hedgerows will require removal for the construction of Option B2. Desk study of Natural England's Ancient Woodland Inventory and historical maps indicates that no ancient woodland (considered to be irreplaceable habitat) would be affected. Desk study of the Woodland Trust's Ancient Tree Inventory indicates that no ancient or veteran trees (also considered to be irreplaceable habitat) are located close to Option D.

9.5.16 The construction of Option C may require the removal of a small copse and vegetation belts at a number of field boundaries, including some woodland belts. It is assumed that woodland is likely to include high quality trees.

9.5.17 Option C has no predicted impacts on pluvial or groundwater flood risk, and although Option C is partially routed through areas of fluvial flooding, loss of fluvial flood storage within Flood zones 2 and 3 can be mitigated by creating replacement flood storage along the watercourse diversions.

9.5.18 Option B1 performs well against several of the historic environment criteria because the permanent infrastructure is more than 500m, and the construction area more than 100m, from the following designated heritage assets: scheduled monuments, registered parks and gardens, registered battlefields and world heritage sites. However, the nearest listed building in Steventon in the Steventon conservation area is 400m from Option C. Grade II Pinmarsh Farmhouse is the closest listed structure at 160m away from Option C.

9.5.19 Considering the land subtheme, within 250m of Option C there are unlikely to be any contamination sources and no authorised or historic landfills. There is potential for disturbance of UXO.

9.5.20 Considering potential landscape and visual impacts, the introduction of traffic,

highway infrastructure and lighting into the rural and undeveloped landscape would disturb the local landscape character and tranquillity of the National Landscape. Traffic and highway infrastructure for Option C would also be visible in some panoramic views from The Ridgeway National Trail and a large number of local PRoWs and residential properties. Construction of Option C would lead to noticeable changes to visual amenity on the northeast fringe of Grove and southern fringe of Steventon. Overall, therefore, there is the potential for significant effects on National Landscape and local views from sensitive visual receptors.

9.5.21 It is judged for Option C that there may be potential significant noise impacts due to construction and operation, but that they are likely to be mitigated if they occur, because the closest noise sensitive property is located approximately 90m from Option C, with six properties in the 'amber band' during construction and nine during operation as set out in Appendix H.

9.5.22 Option C also performs well against the pollution criteria, considering potential impacts associated with discharges during construction and operation, because standard controls during construction and operation are likely to avoid significant effects.

Community, Planning and Land Performance

9.5.23 Considering potential socio-economic impacts, Option C is approximately 200m from the nearest property and for Option C there would be some severance of PRoW.

9.5.24 Option C performs well against much of the consenting criteria because, for example, it is not located within specifically designated areas, such as Green Belt, National Landscape, Common Land, Open Space and minerals safeguarding areas. However, Option C has multiple complex interfaces, including interactions with overhead lines and water, and also requires an extension of the DCO Order Limits south of the railway and outside the area safeguarded for SESRO in the current VoWH Local Plan.

9.5.25 From a transport planning perspective, Option C moves the east-west route away from Steventon and East Hanney to Grove and the Milton Interchange/Didcot. Option C therefore takes existing traffic and public transport far away from the existing route, which affects bus and cycle routes and may impact existing footfall and local income in Steventon.

9.5.26 For property and land acquisition, Option C would go through agricultural land, but this includes additional agricultural land requirements outside of the safeguarded project area, which is considered sensitive in this assessment and used for an annual music festival. There are no identified owners of SCL affected by Option C but Oxford University, considered a sensitive landowner, and Church commissioners for England, a statutory landowner, are both affected by Option C, which may represent a delivery risk.

10 Steventon to East Hanney Road Diversion: Preferred Option

This section summarises appraisal step 6 to identify a preferred option for the Steventon to East Hanney road diversion for use in master planning and consultation.

10.1 Comparison of Engineering Performances

10.1.1 For the constructability and operability themes, the two tables below present a comparison of the options for the Steventon to East Hanney road diversion by subtheme, after their assessment against the appraisal criteria (reported in Section 5) and workshop discussion.

Table 10.1: Steventon to East Hanney Road Diversion - Constructability Subtheme Narratives

Subtheme	Narrative
Health and Safety	It should be noted when considering the health and safety subtheme that no unmitigable construction health and safety risks were identified at this stage for any of the options that significantly differentiated them. Therefore, when considering the preferred option under this subtheme, the utility diversions that are likely to be required for each option are considered, as well as the number of crossings and road length. Option A has fewer crossings than the other options with 10 crossings, while Options B1 and B2 have 11 and Option C has 14 crossings. Option A is also likely to require less diversion works for overhead HV cables, so it is considered preferrable to the other options.
Third Party Impact	All options would likely affect the existing road network with construction traffic such as material deliveries and traffic management. The traffic management would impact road users more significantly when the new road diversion ties in with the existing network and when utilities are diverted from the existing network onto the new road. Option C would likely affect additional landowners, local access tracks and minor roads and the disruption is likely to be significant, whereas Options A, B1 and B2 are located in an area which will already have construction works, reducing the area impacted upon by the SESRO project. As such, Options A, B1 and B2 are favourable.
Logistics	Options A, B1 and B2 are more likely to be constrained by the railway and reservoir embankments, there is only 350m between the toes of the embankment. Option C, however, is much less constrained for space during construction. For Options A, B1 and B2 it is assumed that access for construction of the road diversion would be via the SESRO main access road. For Option C, a separate method of access would be required for

Subtheme	Narrative
	construction, including for the import of materials for the road surface, which will not be possible via the A415 to SESRO Access Road. The earthworks required for the Option C Road embankment would need to be sourced from either side of the road. If earthworks need to be transported from the main site the material would need to be transferred south of the railway, most likely via the A415 and A338, requiring additional construction plant movements and increased traffic. As such, the logistics for Option C are considered more challenging than the other options and this option is not preferred.
Programme	The Steventon to East Hanney Road will need to be constructed prior to the main excavation works in the borrow pit to allow journeys to continue between Steventon and East Hanney. Option A has the shortest length of 5.1km, requiring approximately 90,500m^3 of fill material and is estimated to take just over 2-years to construct. It avoids the additional utility diversions that may be required for B1, B2 and C. Option B1 is likely to require diversion of overhead 33kV power lines and a water main, which increases programme risk. Option B2 may require diversion of overhead 33kV power lines (although this is less likely than for Option B1) and a water main. Options B1 and B2, each require additional lengths of road compared to Option A (1.3km and 1.1km respectively), and considering the utility diversions they would require, they would likely take several more months to construct. Option C has the longest length and a number of additional landowners. Option C also requires a number of additional utility diversions, adding to the programme duration and making it the longest construction programme and so it would have a greater chance of programme risk. Options A, B1 and B2 will have similar programme opportunities, it may be possible to gain temporary construction access from the existing Hanney Road to allow the construction to begin earlier in the programme. Option C creates separation from the main works and, therefore, less dependencies with the other components of the project, it is away from the main construction site and presents opportunities to accelerate the construction programme. There may also be opportunities brought about by avoiding the need for public vehicle access through the main site. Option A is the most favourable option, however, it should be noted that Option A could be built first to gain a programme benefit and the additional road that features that are comprised in Options B1 or B2 (e.g. the road that takes traffic away from Steventon and connects into the B4017) could be completed at a later date to realise any other benefits they may provide in not taking traffic through Steventon.

Subtheme	Narrative
Construction Complexity	Similar construction methods and temporary conditions would be required for all options. For Options A, B1 and B2, there is an opportunity to divert overhead HV (required to be diverted for the reservoir itself) within the road, this opportunity is not available for Option C. The eastern end of the route is at the top of a steep hill and is more complex with 14 crossings, 5 bridges and the largest estimated quantity required for earthworks fill. Options B1 and B2 are considered less complex than Option C, each with 11 crossings and 5 bridges. Option A requires 10 crossings and 4 bridges and so is considered the least complex to construct.

Source: Thames Water Internal, 2024

Table 10.2: Steventon to East Hanney Diversion Road - Operability Subtheme Narratives

Subtheme	Narrative
Health and Safety	The health and safety during operation of the road options will all be acceptable, so long as the roads are designed in accordance with appropriate standards, such as the Design Manual for Roads and Bridges. This subtheme is therefore not considered as a material differentiator between options.
Operational Complexity	The operational complexity involves maintenance of the roads, which will be the same for all road options. This subtheme is therefore not considered as a material differentiator between options.
Operational Resilience	The operational reliability of options and their adaptability during operation are considered as part of the operational resilience subtheme. There is limited differentiation between Options A, B1 and B2 under this subtheme. Option C performs poorly compared to the other options as it would create a less direct bus route connecting East Hanney and Steventon, it also does not offer the opportunity to provide public transport close to the reservoir, the other alignment options could include bus stops close to the reservoir to allow access for walkers. Overall, Option A is marginally more preferred as it makes better use of existing assets (Hanney Road).
Transport Planning	Options A, B1 and B2 are similar in terms of likely third-party impact, including disruption to the existing road network, congestion at junctions and impact on journey time reliability. The transport planning subtheme under operability is therefore not considered to be a material differentiator between Options A, B1 and B2 in this appraisal. Option C is however the least preferred in this subtheme because it is likely to have an impact on the wider road network and existing junctions, including increasing the journey time between Steventon and East Hanney.

Source: Thames Water Internal, 2024

10.1.2 To summarise Table 10.1 and Table 10.2, Option C is the least favourable

option in the overall engineering assessment based on the following:

- Option C is the most complex route to construct with the longest programme and hence the greatest programme risk.
- Option C introduces additional third party impacts by being located away from the main SESRO site, including additional utility diversions when compared to Options A, B1 and B2, which require the same utility diversions as those needed for the reservoir.
- Option C also moves the route connecting Steventon and East Hanney further away from its existing location, making it a less direct route, so it has a likelihood of impacting the wider road network, existing junctions, traffic patterns and journey times.

10.1.3 There is limited ability to differentiate between Options A, B1 and B2 based on the engineering criteria considered; however, Options B1 and B2 have more interaction with existing high voltage overhead lines and existing water infrastructure. Option A is therefore the preferred option.

10.2 Comparison of Cost and Carbon Performances

10.2.1 For the cost and carbon theme, the table below presents a comparison of the options for the Steventon to East Hanney road diversion, after their assessment against the appraisal criteria (reported in Section 5) and workshop discussion.

Table 10.3: Steventon to East Hanney Diversion Road - Cost and Carbon Subtheme Narratives

Subtheme	Narrative
Cost	Option C has the largest estimated cost and Option A has the lowest estimated cost. However, the range in costs for the options represent approximately 1.2% of the total SESRO costs. Given this small range, none of the options are considered to have a cost that would be disproportionate or so great in comparison with the other options that it would be an unreasonable preference (if it performs well in the other subthemes). Cost is therefore not seen as a strong justification for identifying one option over another as preferred.
Carbon	From initial high-level estimates, Option A has the lowest capital carbon emissions so would be preferred under this criterion. Option C has the highest capital carbon emissions so would be least preferred. However, for the same reasoning as with cost, carbon is not considered to be a material differentiator between options at this stage.

Source: Thames Water Internal, 2024

10.2.2 To summarise, neither capital cost nor carbon cost are currently considered as material differentiators between options, when identifying a preferred option, because amongst the indicative high-level estimates none are disproportionately large in comparison with the other options such that one option is an unreasonable preference if it performs well in other subthemes.

10.3 Comparison of Environmental Performances

10.3.1 For environmental performance, the table below presents a comparison of options for the Steventon to East Hanney road diversion by subtheme, after their assessment against the appraisal criteria (reported in Section 5) and workshop discussion. The subtheme narratives in the table consider options during both construction and operation.

Table 10.4: Steventon to East Hanney Diversion Road - Environmental Subtheme Narratives

Subtheme	Narrative
Air Quality	No significant impacts to air quality are expected during construction or operation as all road diversion options are located further than 1km from Marcham AQMA and no construction traffic is expected to pass through this AQMA. Construction impacts would be mitigated by standard controls and for both construction and operation, significant air quality effects are not expected for any option; therefore, the air quality subtheme is not considered a material differentiator between the options in this appraisal.
Aquatic Environment	None of the options are considered to carry a WFD Deterioration risk provided construction and design mitigation is implemented successfully. However, an additional WFD waterbody, the Ginge Brook, is impacted by Option C, which is not impacted by Options A, B1 and B2. The number of watercourse crossings is very similar between Options A, B1 and B2 (ten or 11 crossings) and they are all within the same WFD waterbodies, compared to Option C which has 14 crossings. Risks to the aquatic environment are, overall, assessed to be very similar between different options, meaning that this subtheme is not considered a differentiator between the options in this appraisal.
Biodiversity and Nature Conservation	Options A, B1, and B2 are located to the north of The Cuttings and Hutchin's Copse LWS. Desk study indicates that no ancient woodland would be affected by any of the options. Options A, B1 and B2 may cross wood pasture and parkland but desk study indicates that this area has not been wooded since at least the mid-twentieth century. Desk study indicates that no ancient or veteran trees are located close to any of the options, but surveys may potentially indicate trees that could be classified as ancient or veteran. The construction of the road for all options will also require the removal of priority habitats, such as hedgerow, along with deciduous woodland for Option C, which would need further consideration and mitigation. The biodiversity and nature conservation subtheme is therefore not considered a material differentiator between the options in this appraisal.

Subtheme	Narrative
Biodiversity and Nature Conservation and Landscape	All road options will require the removal of vegetation belts, although Option C will likely have a slightly worse impact upon vegetation than other options as it also requires the removal of a small copse. This subtheme is not considered a material differentiator between the options in this appraisal.
Flood Risk	The construction of the Steventon to East Hanney diversion road will not adversely impact on pluvial or groundwater flood risk. All options are partially routed through areas of fluvial flooding, which can be mitigated for by creating replacement flood storage along the watercourse diversions. The flood risk subtheme is therefore not considered a material differentiator between the options in this appraisal.
Historic Environment	Options A to C have various effects on the setting of listed buildings and/or conservation areas, and furthermore Options A and B1 would require the relocation of a listed milestone. Options A, B1 and B2 pass through a series of cropmark complexes between Hanney Road and the railway line to the south. This is not considered a material differentiator between options in this appraisal.
Land Quality	Options A, B1, and B2 cross the area of Steventon Depot industrial estate, which is likely to be subject to contamination associated with historic land uses. UXO risk may also be heightened around Steventon Depot based on its military history. Option C primarily crosses open fields and does not cross Steventon Depot, although it will cross the (currently unrestored) Wilts & Berks Canal route. There are, however, no landfills located within 250m of any of the options. Option C is preferred, as it does not go through the depot; however, land quality can be remediated for any of the options, so this subtheme is not considered to be a material differentiator between the options in this appraisal.
Landscape and Visual	All options would affect local landscape character and visual receptors due to the introduction of traffic, highway infrastructure, and lighting into the rural landscape. The road would interrupt the small to large-scale field pattern divided by hedgerows and tree/woodland belts which would erode a key characteristic contributing to the local landscape character and setting of the North Wessex Downs National Landscape. Traffic and highway infrastructure would be visible in local views from some PRoW and residential properties. Option C would be closer to the National Landscape and would involve the development of a new road into the generally undeveloped landscape, so is the least preferred. Option A is preferred from a landscape and visual impact perspective as the effect on the visual amenity of Steventon would be less than Options B1 and B2 and, while the effect upon the National Landscape will

Subtheme	Narrative
	potentially be significant in the short term, this could be mitigated in the long term as screen planting matures.
Noise	All options affect a small number of noise sensitive properties. Option C is marginally preferred due to distance and the likely efficacy of noise mitigation, but the noise subtheme is not considered a material differentiator between the options in this appraisal.
Pollution	No significant effects identified as emissions to land and water can be controlled through standard good construction methods and mitigation; therefore, the pollution subtheme is not considered a material differentiator between the options in this appraisal.

Source: Thames Water Internal, 2024

10.3.2 Overall, Option C is the least preferred option as it is located closer to the National Landscape and is a new road on the opposite side of the railway line to the proposed SESRO project. The only potential benefits of Option C would be marginally lower noise impacts due to a slightly longer distance to sensitive receptors and taking road traffic away from the site (reducing disturbance for habitats and walkers).

10.3.3 Option A is the preferred option from a landscape and visual impact perspective, and overall, in terrestrial environment terms, but only marginally better than Options B1 and B2.

10.4 Comparison of Community, Planning and Land Performances

10.4.1 For the community, planning and land theme, the table below presents a comparison of options for the Steventon to East Hanney road diversion by subtheme, after their assessment against the appraisal criteria (reported in Section 5) and workshop discussion.

Table 10.5: Steventon to East Hanney Diversion Road - Community, Planning and Land Subtheme Narratives

Subtheme	Narrative
Socio-Economic	All road options may result in disruption on the A338 and Hanney Road, during construction. Multiple PRoW will be severed by the construction of all road options that may be used by residents to access green spaces. Mitigation is expected to maintain and potentially enhance access for these PRoW in the long term. This subtheme is, therefore, not a material differentiator between the options in this appraisal.
Consenting	Options A, B1 and B2 perform well against the majority of the consenting criteria. Option C requires additional land to be included within the scope of the DCO to the south of the railway and outside the area safeguarded for SESRO in the current VoWH Local Plan. However, this is unlikely to result in materially more land to acquire and severance for all options is likely to be the same.

Subtheme	Narrative
Transport Planning	Option C performs worse than the other three options because the route takes existing traffic and public transport further from the existing route, which affects bus and cycle routes and may impact existing footfall and local income in Steventon. Option B1 and B2 are similar for this subtheme, both moving the existing route north of Steventon and to the south of East Hanney. In comparison, Option A makes use of more of the existing road network, by reusing part of Hanney Road, moving the road least of all the options. Option A is preferred for the transport planning subtheme.
Property and Land Acquisition	All alignments would go through agricultural land and would require broadly the same amount of land-take for each option. Options A, B1 and B2 would all go through the storage depot, but as this is assumed to be acquired for the footprint of the reservoir, this is the same for each of these options and therefore not commented on as a differentiator them. Option A retains the existing route through Steventon. Option B1 would route the furthest away from Steventon. Option B2 would route relatively close to residential properties. Option C would require additional land take outside of the SESRO current safeguarded area. It would impact an area used for an annual music festival and increase the journey distance between Steventon and East Hanney more than the other options. It would also potentially have a negative impact on the traffic in Steventon Hill. For Property and Land, Option B1 is preferred as it would be the furthest from existing properties.

Source: Thames Water Internal, 2024

10.4.2 The comparisons in Table 10.5 are summarised below:

- Socio-economic: All road options outside of Option C are considered to have a similar socio-economic impact by causing disruption on the A338 and Hanney Road, and severing existing PRoWs during construction, but this is not considered a material differentiator between the options in this appraisal.
- Consenting: Options A, B1 and B2 perform similarly against the consenting criteria and any impacts are considered likely to be mitigable. Option C requires the inclusion of additional land within the scope of the DCO to the south of the railway and outside the area safeguarded for SESRO in the current VoWH Local Plan. Additional land acquisition and area of development impacts would require a strong justification relative to the other options that do not require this and would represent a more substantial change to the design concept for SESRO as developed at previous Gates.
- Transport Planning: Options A, B1 and B2 are similar, although Option A is preferred, moving the road the least for all the options. Option C is less favourable as it moves the existing route further away from its existing

location, which is likely to impact the existing bus route as well as making it more difficult to directly connect with the site by road.

- **Property and Land Acquisition:** Option B1 is preferred because it would be the furthest from existing properties and likely have the least impact.

10.4.3 Overall, Option C is the least preferred option for community, planning and land due to its land take outside the safeguarded area. Option B1 is slightly preferred over the other Options B1 and B2 because it impacts fewer properties but generally there is not a significant difference between Options A, B1 and B2, although land severance needs to be reviewed in detail.

10.5 Identification of Preferred Option

10.5.1 A clear outcome from the assessment and workshop for the Steventon to East Hanney road diversion is that Option C performs poorly in relation to all major appraisal criteria groups.

10.5.2 Option A performs slightly better than the rest of the options in a few areas, such as:

- It maintains a direct road link between the two villages (with potential to provide a new active travel route), it would retain the bus route through Steventon (with potential to provide bus stops alongside the reservoir).
- It provides the shortest link between the villages with the potential to provide access points to the reservoir along its length.
- It has less impact on the visual amenity of Steventon than Options B1 and B2.
- It has the potential to require fewer utility diversions than B1 and B2.

10.5.3 It is however recognised that Options B1 and B2 have other potential benefits which Option A does not include such as providing a route to allow traffic to bypass Steventon – although this could also be perceived as a negative if it were to result in a reduction in footfall for businesses in the village. Option B2 is preferred over Option B1 because it is likely to require less diversion of the overhead High Voltage cables.

10.5.4 As such, Option A is identified as the preferred option for the Steventon to East Hanney road diversion for use in master planning and consultation.

11 Conclusions and Next Steps

This section provides conclusions from this option appraisal report and provides recommendations for future work.

11.1 Conclusions

11.1.1 As assessment methodology was established, as outlined in section 2 and detailed fully in the SESRO Option Appraisal Context and Methodology Report. The process followed for establishing the preferred option is summarised below:

- Appraisal step 1: The purpose of this appraisal study was to select a preferred alignment for a new access road to the SESRO site for construction and operational access, including recreational visitor access, and a permanent road diversion connecting Steventon to East Hanney.
- Appraisal step 2: Constraints for the definition of options for the access and diversion roads were identified, as outlined in sections 3 and 7 respectively.
- Appraisal step 3: The SESRO Criteria Table was developed for all the options appraisals of associated infrastructure for the reservoir and is included in the SESRO Option Appraisal Context and Methodology Report. Five specific criteria were developed for the assessment of the road options, relating to topics such as third party impacts, environment and transport planning as outlined in section 2.4.
- Appraisal step 4: Options were defined to a sufficient level of detail for them to be assessed, as presented in sections 4 and 8 access and diversion roads respectively: four options were defined for appraisal for the SESRO main access road; and four options were defined for appraisal for the Steventon to East Hanney road diversion.
- Appraisal step 5: Technical specialists assessed the options against the appraisal criteria, based on their expertise and the assessment methodology. The performance of individual options against the assessment criteria are summarised in sections 5 and 9.
- Appraisal step 6: Following individual options assessments, a workshop was held to bring together specialists to discuss the performance of options in assessment against the criteria, so that preferred options could be identified for the SESRO main access road and the Steventon to East Hanney road diversion. Sections 6 and 10 in this report present the appraisal narratives, comparing the performance of options and identifying key differentiators between options. The outcomes of the options appraisals for the roads are summarised below.
- Appraisal steps 7 and 8: Appraisal steps 7 and 8 will be undertaken as part of the next steps set out below in 11.2.

SESRO Main Access Road

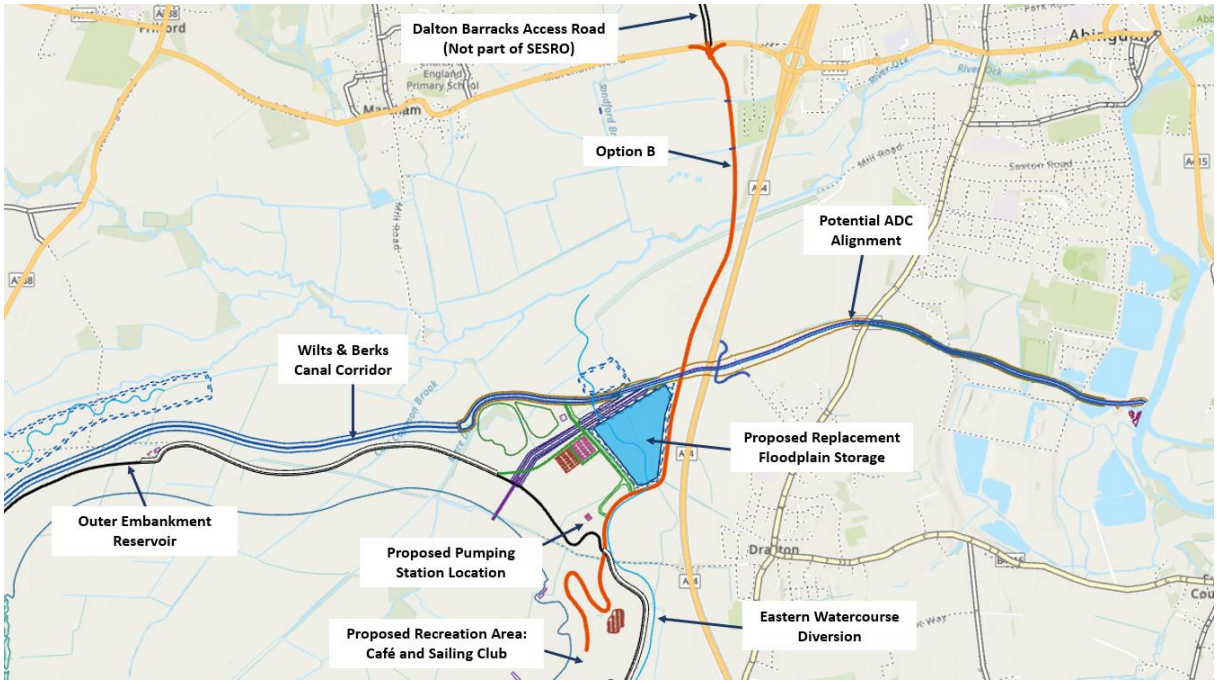
11.1.2 The outcome from the assessment and workshop for the SESRO main access road is that there is that there is little to differentiate options across Engineering, Cost and Carbon, Environment and Community, Planning and Land themes. However, Option B has been identified as the preferred option as it performs slightly better than the other options in a few areas, such as:

- Landscape and visual impact – Option B performs best as it is nearest to the existing A34 so would be located next to existing highways infrastructure development.
- Consenting - Option B is slightly preferred due to requiring the least additional land to be included in the scope of the DCO and remaining fully within the area safeguarded for SESRO in the current VoWH Local Plan.

11.1.3 In addition, it is noted that Option B provides the opportunity to work in partnership with external schemes, such as Dalton Barracks, the possible future South Abingdon-on-Thames Bypass and the potential FSR for Abingdon.

11.1.4 The Option B alignment, as shown in Figure 11.1,commences with a roundabout to connect onto the A415 Marcham Road, opposite the potential access road to the proposed residential development at Dalton Barracks. The route runs south close to the A34 for approximately 2.4km, it crosses over the potential location of the ADC (subject to further options appraisal assessment) and then turns west towards the proposed location of the pumping station. It then connects to the operation area roads, which have been set outside of this study, and provides access to maintain operational infrastructure such as the ADC, recreational lakes, siphons, and the siphon channel, as well as the proposed location of the contractor's compound during construction, which is planned to be used for parking during operation. After the pumping station, the alignment then turns south again for approximately 500m and then traverses up the embankment to the crest of the reservoir in its northeast corner.

Figure 11.1: SESRO Main Access Road - Appraisal Study Preferred Option



Source: Esri, Intermap, NASA, NGA, USGS | Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

Note: Ancillary items not related to the road are indicative based on Gate 2 proposals, including the Auxiliary Drawdown Channel (ADC), siphons, car parking and pumping station.

Steventon to East Hanney Road Diversion

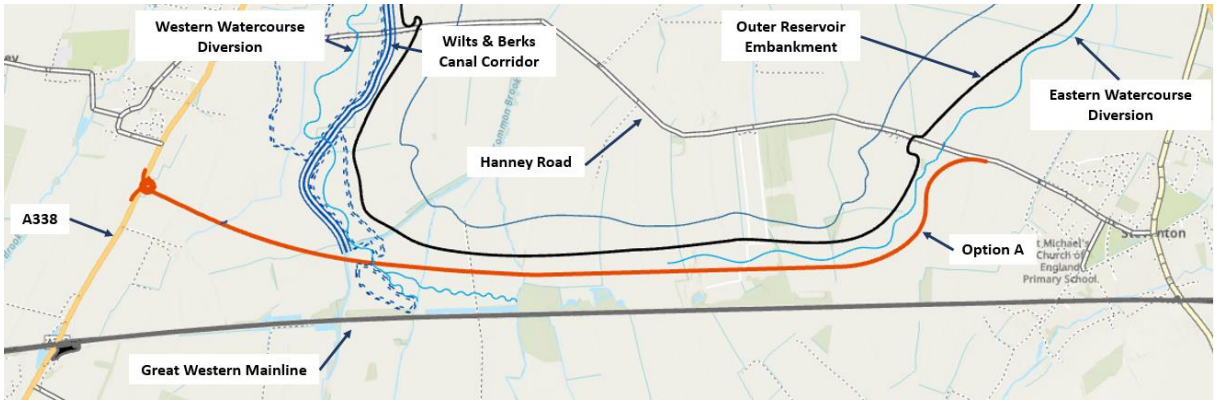
11.1.5 Option A has been identified as the preferred option for the Steventon to East Hanney road diversion. It performs significantly better than Option C (that performs poorly in relation to all major appraisal criteria groups) and marginally better than other options in the following areas as:

- It maintains a direct road link between the two villages (with potential to provide a new active travel route), it would retain the bus route through Steventon (with potential to provide bus stops alongside the reservoir).
- It provides the shortest link between the villages with the potential to provide access points to the reservoir along its length.
- It has less impact on the visual amenity of Steventon than Options B1 and B2
- It has the potential to require fewer utility diversions than B1 and B2.

11.1.6 The alignment of Option A commences in the east from Hanney Road just outside of Steventon, it then turns immediately south towards the Great Western Mainline 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 watercourses and the proposed new corridor for the alignment of the Wiltshire and Berkshire Canal. After the crossings, the road heads northwest for approximately 1.2km where it is proposed to connect onto the existing A338

with a roundabout, which is approximately 250m from the southern boundary of East Hanney.

Figure 11.2: Steventon to East Hanney Diversion Road - Appraisal Study Preferred Option



Source: Esri, Intermap, NASA, NGA, USGS | Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

11.2 Next Steps

11.2.1 The next step is to develop a master plan to reflect the outcome of this study and the options appraisal reports. When all the preferred options from these reports are brought together, it may be necessary to adjust the preferred road options, or adjust preferred options from other appraisal activities, by undertaking a backcheck of the work undertaken in this study. This will include a review of any assumptions used within this appraisal from the Indicative Gate 2 Masterplan and any changes required following the development of the Gate 3 Interim Landscape and Environmental Master Plan.

11.2.2 For the preferred option for the main access road to the SESRO reservoir site, Option B, it will be necessary for the SESRO project development team to remain up to date with progress and the latest developments of external partnership schemes which may impact on the alignment, including any new or revised schemes that may come forwards through consultation on the Vale of White Horse and South Oxfordshire draft Joint Local Plan as it moves through consultation and examination stages. These schemes include:

- The allocation of the Dalton Barracks site for residential development.
- The identified area for a potential Flood Storage Reservoir (FSR) for Abingdon, which could be developed by the Environment Agency.
- The identified area for a possible future South Marcham Bypass (also known as the Marcham Movement Corridor), proposed by the Vale of White Horse Council, South Oxfordshire Council and Oxfordshire County Council.
- The identified area for a possible future South Abingdon-on-Thames Bypass (also known as the Southern Abingdon Movement Corridor), proposed by the Vale of White Horse Council, South Oxfordshire Council and Oxfordshire County Council.

- The identified areas for a potential Wantage and Grove Station for passenger rail travel, proposed by the Vale of White Horse Council, South Oxfordshire Council and Oxfordshire County Council.

11.2.3 In future meetings with OCC and National Highways, the SESRO project team will discuss the proximity of the SESRO main access road roundabout to the A34 junction, which should also lead to the rationalisation of the number of roundabouts on the A415. The preferred option, Option B, assumes the roundabout to be located opposite the potential development at Dalton Barracks; however, if the possible future South Marcham Bypass goes ahead, there will be a need for an additional roundabout on the A415 or an opportunity to provide one roundabout for both schemes.

11.2.4 For the Steventon to East Hanney diversion road, it would be beneficial for the SESRO project development team to continue discussions with the VoWH and OCC to remain updated with progress for the development of the proposed Wantage and Grove Station. Any decision regarding whether the station is developed or not is unlikely to change the decision regarding the preferred option, however, it might be possible to realise opportunities for both schemes through minor amendments to the route.

11.2.5 Many of the assessments under the environment and community, planning and land themes are based on desktop studies. For the preferred options these will be validated (particularly in relation to environmental issues) with field surveys, assessments and contact with relevant stakeholders where required. If findings diverge from the desktop information used further backchecking of this options appraisal will be required as outlined in paragraph 1.3.3.

11.2.6 For example, for this appraisal study it has not yet been possible to fully confirm the presence, location and number of ancient and veteran trees, as full land access has not been available for survey. Once surveys are complete, a backchecking exercise should take place to ensure that the appraisal outcomes remain unaffected.

Appendix A SESRO Access Road Option A Criteria Workbook

A415 to SESRO Road A

Criteria code	Criteria Description	Method of Assessment	RAG	Description of RAG	Narrative	Sub-Theme
Constructability						
CON1	Safety - Risk of endangering construction workers or members of the public during construction e.g. water, ground, height, rail, road and utilities	Look at programme and list types of construction involved. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	A	Works can be constructed safely but enhanced control measures required	Option A requires 8 crossings and requires 1.7km of 132kV HV Overhead diversions and a gas diversion over the ADC. These would increase the risk of endangering workers and require enhanced measures, and is therefore rated amber.	Health and Safety
CON2A	Programme - Duration, longest /shortest, but also consider whether the longer duration has an impact on the overall scheme programme	Compare differences in the programmes which would materialise from different options. Consider earthworks seasons.	A	Likely to extend the duration of the relevant area of works (e.g. road, rail siding or intake/offtake construction) compared to the Gate 2 SESRO programme but unlikely to impact on the critical path of the Gate 2 SESRO programme.	Option A has length of 5.1km and an estimated 102,400m3 of fill. Option A has an alignment which is close to the A34, which brings in the opportunity for the bridge across the ADC to also be used for the gas diversion and (potentially) to help facilitate the temporary diversion of the A34 to allow the construction of the ADC box culvert.	Programme
CON2B	Programme - Opportunities for construction programme acceleration through efficiencies	Compare differences in the programmes which would materialise from different options.	G	The option has the potential to introduce programme efficiencies and reduce the construction programme	If construction access can be temporarily provided from the A34 layby then construction traffic can be allowed from both ends of the road. In addition to this, for Option A, the alignment provides an opportunity to reduce the construction programme associated with the gas diversion and the ADC box culvert below the A34.	Programme
CON2C	Programme - Dependencies i.e. proximity or physical relationships between elements of scope that introduce programme dependencies	Is the options on the critical path? Will it impact other critical activities?	A	Several major dependencies/ multiple minor dependencies	The A415 to SESRO Access Road, and other haul roads need to be constructed prior to construction of the rail sidings. This option, therefore, has multiple minor dependencies and scores amber.	Programme
CON2D	Programme - Risk	Are there items in the construction which have a significant programme risk	A	Moderate programme risk	Option A has some utility diversion requirements, and is in a flood zone. It is therefore considered to have moderate programme risk and is rated amber.	Programme
CON3A	Logistics - Space available for construction and materials storage	Determine space constraints using GIS and options layouts from option definition.	G	Adequate space	Option A has adequate space on the west side which could be used for construction compounds and Replacement Floodplain Storage (which will be needed to account for the road embankment which is located within the current floodplain).	Logistics
CON3B	Logistics - Suitable and efficient access for construction workers, deliveries and waste removal including minimisation of lengths of new roads for access during construction	Determine method of access using GIS and options layouts from option definition.	G	Adequate access is available, and only short length (relative) of road is required for construction	A415 to SESRO Access Road itself is providing access for construction workers and deliveries.	Logistics
CON3C	Logistics - Import of materials or resources during construction	Use quantity estimates to assess different options.	A	Moderate amount of import materials required	The A415 to SESRO Access Road requires the import of materials for the road surface. The earthworks required for the road embankment are assumed to be sourced from the site. This option is assessed as amber because access to construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.	Logistics
CON3E	Logistics - Vehicle movements	Use vehicle movement estimates to assess different options.	A	Construction likely to add vehicle movements.	The number of vehicle movements will be related to the length and earthworks required. This option is assessed as amber because access to the construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.	Logistics
CON4A	Construction Complexity - Temporary conditions/works requirements e.g. embankment slope stability and moisture outside of placement seasons.	Expert Judgement	G	Temporary Works requirements minimal and can be used in the permanent state and no extension to the programme	This option is assessed as green because the temporary state can be easily adopted to a permanent state i.e. an initial subbase may be laid on top of an embankment and then later used as part of the permanent state. Option A has 8 crossings, 4 of which are likely need to a bridge.	Construction complexity
CON4B	Construction Complexity - Location conflict/opportunity with another engineering component of the scheme or other SRO/non-SRO schemes, e.g. Severn to Thames Transfer (STT), Thames to Southern Transfer (T2ST), TW Swindon and Oxfordshire supply zone transfer, Transfer to Farmoor Reservoir	Expert judgement and knowledge of surrounding schemes	A	Location / layout of the option neither clashes nor provides an opportunity to be developed with another component of this scheme (or another scheme)	Potential for conflict with / alignment with the proposed South Abingdon Bypass Scheme and / or the Abingdon Flood Alleviation Scheme. At this stage scored amber as these can be viewed as a conflict or an opportunity. The junction would need to take Dalton Barracks traffic into consideration in the design of the roundabout.	Construction complexity
CON4C	Construction Complexity - Minimise the number and complexity of additional structures/assets required or modifications to the existing structures/assets in order to facilitate the option, e.g. bridges, culverts, crossings	Determine using GIS and options layouts from option definition.	A	Option requires a moderately complex (mitigation likely) and/or moderate number of additional structures and/or modification to existing structures.	Option A scores amber as it requires a moderate number of new structures (8 crossings)	Construction complexity
CON5A	3rd Party Impact - Potential to disrupt existing road network during enabling works and construction	Expert judgement	A	Disruption likely to be moderate	This option is assessed to have a moderate impact on traffic because construction material will be delivered to site by road; however, the rate of deliveries is expected to be on average below 20 HGVs per day, assuming reservoir materials are brought in via train.	3rd Party Impact
CON7A	Ground - Terrain of site, and implications for the need for earthworks and engineered slopes	Use of lidar and civil 3D models to assess amount/location of earthworks required	G	Terrain is favourable to the design of assets and therefore reduces the amount of earthworks required	Option A crosses the relatively flat River Ock floodplain. South of the River Ock the road along the Option A alignment would route close to the A34 where it would rise up over a hill. Option A requires an estimated 102,400m3 of fill material.	Construction complexity
CON7B	Ground - Risk of unexpected conditions	Use of expert judgement based on comparable areas	A	Moderate exposure to risk of unexpected ground conditions.	The road option passes through the undeveloped floodplain of the River Ock, so there is a moderate risk for unexpected ground conditions. There is a possibility of high water table from the River Ock.	Construction complexity
CON7C	Ground - Impact of ground conditions on the complexity of design and construction	Use of expert judgement	G	Ground conditions are unlikely to increase the complexity of design and construction with likely only a minimal (if any) impact on cost or requirement for materials that are difficult to source	The road option passes through the undeveloped floodplain of the River Ock, so there is a moderate risk for unexpected ground conditions. Ground conditions are unlikely to increase the complexity of design.	Construction complexity
Operability						

OPS1A	Safety - Risk of endangering operational staff, visitors or members of the public during operation	Look at operational activities and public access. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	G	Works can be operated safely without enhanced control measures	The road design follows best practice such as the Design Manual for Roads and Bridges regarding elements such as the speed limit, bend radii, gradients and drainage.	Health and Safety
OPS1B	Safety - Access and egress for operational staff, visitors, deliveries and waste removal during normal operations and emergencies	Tunnel silt issue to be considered by expert judgement	G	Access/egress can be provided	The road design follows best practice such as the Design Manual for Roads and Bridges, allowing for sufficient access/egress in emergencies.	Health and Safety
OPS2A	Maintenance - Ease of maintenance	Expert judgement	G	Majority of maintenance activities could be undertaken during limited closure periods and / or with limited disruption	This road option will be accessible for maintenance. It is anticipated that it could be closed for maintenance during times of low traffic movement (i.e. at nights and/or weekdays), or be undertaken so that a single lane is kept open to minimise disruption.	Operational Complexity
OPS4A	Reliability - Footprint of the option within flood zones (as an indication of the potential for damage and the challenge of operation / maintenance during flood events)	Review GIS supported by expert judgement	A	Option is within the flood zone, however damage is not considered to be a significant risk	Option is within the flood zone, however damage is not considered to be a significant risk as option will be designed (i.e. elevation, drainage) to withstand predicted flooding without damage.	Operational Resilience
OPS4B	Reliability - The option does not have a single point of failure but rather includes backup infrastructure so that it can remain in operation if the primary infrastructure is unavailable, e.g. siphons in addition to tunnel for emergency discharge or alternative road route to reservoir crest	Expert judgement	A	There is a single point of failure but mitigation measures can be introduced to allow for continued operation, which might be a delayed or reduced service	In a scenario where the A415 to SESRO Access Road is out of operation it is assumed that access would be provided for operational vehicles via retained haul roads and the proposed local car park at the end of the Hanney Road "stub" outside of Steventon.	Operational Resilience
OPS5A	Adaptability - Space available for future expansion of social / recreation infrastructure	Expert judgement	G	Opportunity / adequate space for envisaged expansion	No expansion envisaged; however no constraint identified to future expansion, albeit impact on the floodplain would need to be assessed during design.	Operational Resilience
OPS5B	Adaptability - Flexibility for future modifications e.g. increasing reservoir storage volume, rail station at wantage and grove, construction of Marcham Bypass	Expert judgement	G	Option includes a large degree of flexibility for future modifications	Option A alignment offers the opportunity for dual functions (Abingdon Flood Alleviation Scheme and / or South Abingdon Bypass).	Operational Resilience
OPS8A	3rd Party Impact - Potential to disrupt existing road network during operation	Expert judgement	A	Disruption likely to be limited	The Option A junction location was tested with indicative traffic flows, which indicated they can be managed appropriately. The junction location is set back from the A34 to decrease the risk of impact on the A34.	Transport Planning
OPS8C	3rd Party Impact - Option facilitates infrastructure for other modes of transport, including pedestrians, cyclists and other non-motorised users	Expert judgement. Review GIS for PRoW, cycle routes, etc.	G	Option provides segregated cycle facilities, a footway that is wider than 2m, and suitable crossing infrastructure is provided for pedestrians and cyclists. Additional Bridleways or improvements or maintenance provided to existing bridleway routes are also included	PRoWs can be linked across the site creating new routes to surrounding area. The options are considered to score similarly against this criteria. Options A & B leave more land to the west which potentially leaves more locations for additional PRoWs that would not need to cross the road.	Transport Planning
OPS8D	3rd Party Impact - Congestion at the relevant junctions for all movements, and the effective use of the transport network through innovative solutions	Expert judgement	A	Option provides a partial solution to delivering roads that will be effectively able to deal with traffic upon completion. However, the junctions designed may be unable to cope with traffic flows in future years.	Initial modelling illustrates capacity at highway junctions reduces over time, however, this is can be managed.	Transport Planning
OPS8E	3rd Party Impact - Impact on journey time reliability	Expert judgement	A	Option is not expected to either increases or improve journey times for road users on the road network	Initial modelling illustrates capacity at highway junctions reduces over time, however, this is can be managed.	Transport Planning
Relative Costs						
COS1	Capex cost of the option	Cost estimate calculation for each option.	G	CAPEX estimated to result in an increase of <1% of the CAPEX for the overall SESRO project compared to the lowest cost option	Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 0.4% of the total SESRO costs. Option A results in a total project cost of 0.3% more than the lowest cost option.	Cost
COS3	Opportunity for cost-sharing with other SROs, NSIPs and local non-SRO schemes/plans, e.g. STT, T2ST, SWOX/Farmoor, Abingdon flood storage	Cost estimate calculation for each option.	G	Multiple opportunities identified for cost saving.	Option A provides an opportunity for cost-sharing with the South Abingdon Bypass scheme and / or the Abingdon Flood Alleviation Scheme.	Cost
Carbon Costs						
CAR1	Carbon costs associated to the Capex of the option	Carbon estimate calculation for each option.	G	Emissions (tCO2e) estimated to result in an increase of <1% of the emissions (tCO2e) for the overall SESRO project compared to the lowest emissions (tCO2e) option	Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option A results in a total project carbon of 0.5% more than the lowest carbon option.	Carbon

CAR3	Opportunity for mitigation e.g. smaller earthworks may lead to less carbon	Carbon estimate calculation for each option.	A	Limited likelihood and magnitude of mitigation opportunity.	Option A has an average route length. The route is adjacent to the replacement flood storage area which could an offer an opportunity to rationalise the earthworks to lead to the consumption of less carbon. The route also passes close to the A34 which brings in the opportunity for the bridge across the ADC to also be used for the gas diversion and (potentially) to help facilitate the temporary diversion of the A34 to allow the construction of the ADC box culvert.	Carbon
Environmental Performance						
ENV1A	Minimise impacts on Special Area of Conservation (SAC)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SAC's or potential SAC's within the boundary of the proposed A415 option A road. The closest SAC to the road is Cothill Fen SAC located approximately 2.8Km to the north.	Biodiversity and Nature Conservation
ENV1B	Minimise impacts on Special Protection Area (SPA)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SPA's or potential SPA's within the boundary of the proposed A415 option A Site. The closest SPA to the proposed road is Thames Basin Heaths SPA located approximately 43Km to the south-east.	Biodiversity and Nature Conservation
ENV1C	Minimise impacts on Ramsar	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no Ramsar sites or potential Ramsar sites within the boundary of the proposed A415 Option A. The closest Ramsar site to the Road is South-west London Waterbodies located 58Km to the south-east.	Biodiversity and Nature Conservation
ENV1D	Minimise impacts on Site of Special Scientific Interest	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	Road is located within the Impact Risk Zone for Barrow Farm Fen SSSI. However, impacts are considered unlikely due to the distance the works are located away from the SSSI.	Biodiversity and Nature Conservation
ENV1E	Minimise impacts on National Nature Reserve	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no NNR within the boundary of the proposed A415 option A site. The closest NNR is located 2.7Km to the north. Cothill NNR.	Biodiversity and Nature Conservation
ENV1F	Minimise impacts on Local Nature Reserve (LMN)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no LNR within the boundary of the proposed A415 Option A. The closest LNR to the Road is located 4.7Km to the east of the site. The site is called Abbey Fishponds LNR.	Biodiversity and Nature Conservation
ENV2A	Minimise impacts on Ancient Woodland	Natural England Ancient Woodland Maps and Professional Judgement.	G	No ancient woodland impacted	Historic mapping indicates that there is no ancient woodland present on-site	Biodiversity and Nature Conservation
ENV2B	Minimise impacts on Ancient and Veteran Trees	Woodland Trust Ancient Tree Inventory map search and professional judgement	A	Development in close proximity with potential indirect impact to ancient or veteran trees	There are no ancient or veteran trees recorded by the Woodland Trusts Ancient Tree Inventory on or close to this option. However, survey may identify trees that could be classified as ancient or veteran. As such, this option scores amber on a precautionary basis pending survey.	Biodiversity and Nature Conservation
ENV2C	Minimise impacts on Protected Trees	Check against published TPO dataset.	G	No protected trees impacted	No protected trees would be impacted.	Landscape & Visual
ENV2D	Minimise impacts on vegetation (including trees, woodland, hedges and shrubs)	Check against baseline resources and based upon high level knowledge of site from previous site visits. Professional judgement.	G	No direct impact on vegetation which is of high arboricultural/amenity value (A or B grade) or biodiversity habitat in good condition. OR Limited direct impact on vegetation which is of lower arboricultural/visual amenity value (e.g. C grade) or biodiversity habitat in poor condition.	Construction of the road will require the removal of vegetation belts at several field boundaries, including a limited section of a woodland belt. It is assumed that few if any A or B grade trees are likely to be impacted.	Biodiversity and Nature Conservation and Landscape
ENV3	Minimise impacts on Local Wildlife Sites (LWS)	Professional Judgement and LWS Citation provided by TVERC.	G	No impacts to LWS	There are no LWS located within or adjacent to the boundary of the A415 Option A. The closest LWS to the road is located approximately 1.1km to the south-west (Marcham Salt Spring LWS)	Biodiversity and Nature Conservation
ENV4A	Minimise impacts on Scheduled monuments or activities which could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	Road route lies over 800m from the nearest scheduled monument (the settlement site north of Cow Lane).	Historic Environment
ENV4B	Minimise impacts on listed buildings or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	Nearest property is Grade II* listed Hyde Farmhouse at Marcham, 400m to the west of the option as it leaves Marcham Road.	Historic Environment
ENV4C	Minimise impacts on Registered Parks and Garden or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest Registered Park and Garden of Albert Park in Abingdon lies over 1.5km east of the option alignment.	Historic Environment
ENV4D	Minimise impacts on Registered Battlefields or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest Registered Battlefield of the 1643 Battle of Chalgrove lies over 15km east of the option alignment.	Historic Environment

ENV4E	Avoid impacts on World Heritage Sites or activities that could lead to a loss of significance, including setting	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	Blenheim Palace World Heritage Site lies 18km north of the proposed route alignment.	Historic Environment
ENV4F	Minimise impacts on conservation areas which could result in loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest conservation area (Drayton) lies just under 700m east of the route option alignment.	Historic Environment
ENV5A	Minimise loss to non-designated built heritage	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Extensive loss of non-designated built heritage of medium value within the permanent infrastructure zone and adverse changes to the setting within a 500m area from the edges of the permanent infrastructure OR more limited effects on remains of non-designated built heritage of high value	No identified non-designated built heritage along the line of the route option but an historic mill lies just under 500m east of the option alignment on the River Ock.	Historic Environment
ENV5B	Minimise loss to paleoenvironmental remains	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	A	Extensive scale of loss or damage to medium value remains within the construction area and adverse changes to similar buried remains in a 1km area around the permanent infrastructure from temporary and permanent changes to local hydrogeological regimes OR more limited effects on remains of high value	The route option crosses the River Ock and paleoenvironmental remains will be present, though their extent and significance are unknown.	Historic Environment
ENV5C	Minimise loss to non-designated historic landscapes	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or extensive changes to low value non-designated historic landscapes within the construction area and extensive changes to the setting of the same resource outside the permanent infrastructure OR more limited effects on non-designated historic landscapes of medium value	No non-designated historic landscape assets within the proposed route option alignment or within 500m of it.	Historic Environment
ENV5D	Minimise loss of non-designated archaeological remains	Professional judgement, incorporating the use of the IEMA's Principles of Cultural Heritage Assessment in the UK and the Chartered Institute for Archaeologists standard and guidance document for desk based assessment	A	Permanent infrastructure and construction area will result in the loss and / permanent damage to non-designated buried and extant archaeological remains worthy of regional significance which can only be partially mitigated through preservation by record	The route passes through an Iron Age and Romano-British cropmark complex (HER 15283) and potential settlement, but the value of these assets is currently unknown and a regional value has been assumed given a worst case scenario. The route also crosses the historic Wiltshire-Berkshire Canal and its partially extant structural remains. The Canal might warrant a regional heritage value.	Historic Environment
ENV6A	Minimise loss of fluvial flood storage within Flood Zone 2 or 3	Measure using GIS	A	Site is within flood zone 2 and 3 but loss of storage is minor or mitigation is available	Option is not considered to have a significant impact on fluvial flood risk, 17,365m2 area of road is sited within flood zones but sufficient space has been provided for Replacement Floodplain Storage along the watercourse diversions.	Flood Risk
ENV6B	Minimise impacts of pluvial flood risk.	Expert judgement	G	No predicted impacts on pluvial flood risk	Option is not considered to have a significant impact on pluvial flood risk as it is a single carriageway. The options are considered to score similarly against this criteria.	Flood Risk
ENV6C	Minimise impacts of groundwater flood risk.	Checking existing national and local records	G	No predicted impacts on groundwater flood risk	Option is not considered to have a significant impact on groundwater flood risk. The options are considered to score similarly against this criteria.	Flood Risk
ENV7A	Minimise disturbance of potentially contaminated land	Checking existing national and local records	G	Minimal or no disturbance of contaminated land unlikely to cause cost or program implications or harm to potential receptors. No remediation required	There are unlikely to be contamination sources within 250m of this option other than the Marcham Road, the infilled canal which crosses the site and potentially the A34.	Land
ENV7B	Minimise disturbance of potentially contaminated land specifically in relation to authorised and historic landfills	Checking existing national and local records	G	Not within authorised and historic landfills or previous industrial sites or within 250m of authorised and historic landfills or previous industrial sites	There is no authorised or historical landfill within 250m of this option.	Land
ENV8	Minimise disturbance of land with known potential for Unexploded Ordnance (UXO)	Checking existing national and local records	A	Disturbance of a low quantity of UXO which can be easily managed / remediated. Unlikely to have significant cost or program implications	A pre-desk study assessment from Zetica acquired for gate 2 identified various potential UXO risks across the SESRO area, therefore, recommend a detailed UXO survey of the area. Specifically an early 20th century rifle range was in use in the area of this option.	Land
ENV9A	Minimise loss of terrestrial priority habitats (use narrative to describe type and quantum)	Use of aerial imagery, MAGIC maps and Professional Judgement	A	Priority habitat directly impacted but mitigation feasible	Construction of the road will require the removal of Floodplain Grazing Marsh, Deciduous Woodland and Hedgerows which are all listed as Priority habitats. The River Ock will also be crossed which is also a Priority habitat.	Biodiversity and Nature Conservation
ENV9B	Minimise loss of aquatic priority habitats (use narrative to describe type and quantum)	Professional judgement based on knowledge of Water Framework Directive.	A	Priority habitat directly impacted but mitigation feasible	Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the any WFD waterbody to reduce potential impacts.	Aquatic Environment

ENV10A	Reduce effects on North Wessex Downs Area of Outstanding Natural Beauty (AONB) and its setting	Professional judgement.	A	AONB and its setting likely to be affected. Effect is unlikely to be significant.	The introduction of traffic, highway infrastructure and limited lighting into the rural landscape would be within the context of the adjacent A34 and Marcham Road highway corridors. However, the interruption of small to large-scale field pattern divided by hedgerows and tree/woodland belts along watercourses would erode a key characteristic which contributes positively to the local landscape character and setting of the North Wessex Downs AONB. Effect on landscape character and tranquillity of AONB unlikely to be significant due to distance and presence of existing highway infrastructure in the immediate vicinity.	Landscape & Visual
ENV10B	Reduce effects on local landscape character	Professional judgement.	A	Effect on local landscape character is unlikely to be significant.	The introduction of traffic, highway infrastructure and limited lighting into the rural landscape would be within the context of the adjacent A34 and Marcham Road highway corridors. The level of tranquillity, which also is affected by noise, would therefore only be slightly reduced. However, the interruption of small to large-scale field pattern divided by hedgerows and tree/woodland belts along watercourses would erode a key characteristic which contributes positively to the local landscape character. While effects on local landscape character may be significant in the short term, this could be mitigated in the long term, particularly given the presence of existing highway infrastructure and traffic on the A34. (Effect on landscape character would be slightly greater than Option B.)	Landscape & Visual
ENV11A	Reduce effects on panoramic views from national trail, open access land and important viewpoints in AONB	Professional judgement.	G	Panoramic views from national trail, open access land and important viewpoints in AONB unlikely to be affected or the proposal is likely to be barely discernible in views.	Given the distance, traffic and highway infrastructure on the new road is likely to be barely distinguishable from the A34 road corridor in panoramic views from The Ridgeway National Trail, especially when mitigation has established.	Landscape & Visual
ENV11B	Reduce effects on sensitive local visual receptors	Professional judgement.	R	Effect on local views of sensitive visual receptors likely to be significant.	Traffic and highway infrastructure is likely to be visible in local views from some PRoWs and residential properties on the eastern edge of Marcham. There would also be some filtered views through existing vegetation from the western edge of Drayton, seen in the context of pylons, overhead lines and existing traffic on the A34. Effects on most views could be reduced in the long term, but some significant effects may remain.	Landscape & Visual
ENV12	Minimise disturbance/encroachment into Air Quality Management Area (AQMA)	Based on an understanding of the scale and nature of activities, air quality management areas (AQMAs) were identified in close proximity to the proposed works.	A	Within 1km of an AQMA OR some construction traffic must go through an AQMA	Marcham AQMA is approximately 400 m W of the Road A access point. Although the anticipated construction and operational activities would likely lead to a negligible change in air quality (assuming construction traffic and the majority of tourists travel E along the A415), the proximity of the AQMA means Road A is assigned an amber score.	Air Quality
ENV13	Minimise disturbance/encroachment into Groundwater Source Protection Zone (SPZ)	Magic maps	G	Site is within Zone 3 or not within a SPZ	Site is not within an SPZ.	Aquatic Environment
ENV14A	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Cow Common Brook and Portobello Ditch' WFD waterbody (GB106039023360) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14B	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ock and tributaries (Land Brook confluence to Thames)' WFD waterbody (GB106039023430) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - Crossing on River Ock is nearer to A34 crossing, on a straight section, reducing the area of impact. Any impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14C	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Thames (Evenlode to Thame)' WFD waterbody (GB106039030334) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14D	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Sandford Brook (source to Ock)' WFD waterbody (GB106039023410) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - The route has two crossings on the Sandford Brook WFD waterbody as well as surrounding tributaries. Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. Clear span, bridges should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14E	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Childrey Brook and Norbrook at Common' WFD waterbody (GB106039023380) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment

ENV14F	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ginge Brook and Mill Brook' WFD waterbody (GB106039023660) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14G	Option does not affect Water Framework Directive (WFD) Quality Elements within one of WFD waterbodies downstream of the River Thame to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives. These WFD waterbodies include: - Thames Wallingford to Caversham - WFD waterbody GB106039030331 - Thames (Reading to Cookham) - WFD waterbody GB106039023233 - Thames (Cookham to Egham) - WFD waterbody GB106039023231 - Thames (Egham to Teddington) - WFD waterbody GB106039023232	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV15A	Maximise potential for future environmental benefits (terrestrial), e.g. increase tree planting	Professional Judgement	G	Site allows substantial additional environmental benefits to be realised	Being a predominantly arable landscape there is plenty of opportunity for environmental enhancement through the planting of trees and creation of habitats with high distinctiveness. Also opportunity for the creation of wetland areas including wet woodland and ponds.	Biodiversity and nature conservation
ENV15B	Maximise potential for future environmental benefits (aquatic), e.g. increase wetlands area	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Site allows substantial additional environmental benefits to be realised	Connectivity through the watercourse and associated wetlands is crucial. Thus any road crossings will need to consider this appropriately and mitigation provided.	Aquatic Environment
ENV16	Maximise flexibility in routing diverted watercourses so their habitats can be of sufficiently high quality to contribute to catchment Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Site allows some flexibility in routing watercourses / Good quality habitat options are available	There appear to be no / minimal interaction conflicts with the Eastern Watercourse Diversion design, although there is a single watercourse crossing. Road crossings need to ensure sufficient light and connectivity through the structure. Preference is a clear span, bridge on all crossings of principal WFD waterbodies (blue line) but an appropriately sized box culvert is acceptable on other watercourses in the WFD catchment. Pipe crossings will be deemed to be unacceptable and should be avoided.	Aquatic Environment
ENV17	Minimise disturbance/encroachment into Local Geological Sites (LGS)	Checking existing national and local records	G	Site is located more than 250m from LGS	No LGS identified within 250m of the layout	Biodiversity and nature conservation
ENV18A	Minimise impacts associated with Noise and Vibration as a consequence of the construction of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment. Red band distance is from works site/road to the SOAEL+5dB, and Amber distance is from SOAEL+5dB to the SOAEL. Road Construction: Red 60m, Amber 61-99m, Green 100m. Construction Traffic: Red 40m, Amber 41-184m, Green 185m. Road Const. (bridge construction): Red 75m, Amber 81-124m, Green 125m. (NOTE: No sensitive properties have been identified within 125m of potential piling works at road bridges and significant effects are not anticipated. Distances referenced in the assessment are those measured between the proposed roads and receptors). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis (with >700 extra receptors included, namely at Diversion Road C, which is outside of Gate 2 Study Area).	G	Impacts unlikely, or adverse impacts are likely to be mitigated if they occur	The closest noise sensitive property is located over 300m from Access Road A415-SESRO Option A, as such, no significant adverse effects are predicted.	Noise

ENV18B	Minimise impacts associated with Noise and Vibration as a consequence of the operation of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment (inc. bunding around sidings). Red band is from works site to the SOAEL+5dB distance, and Amber is from SOAEL+5dB distance to the SOAEL. Rail Sidings: Red 675m, Amber 676-1209m, Green 1210m. This is based on worst-case activity, Material Handling, which includes potential for works between 06:00 to 07:00 and was assessed using night-time noise assessment criteria at Gate 2 as a precautionary approach. The noise emission for the activity is based on G2 assumptions, with update made following review by Costain (JB 05Jun). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis.	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	The closest noise sensitive property is located over 300m from Access Road A415-SESRO Option A, as such, no significant adverse effects are predicted.	Noise
ENV19A	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the construction of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	Road A is adjacent (<50 m) to the Westend allotments, which is considered a low / medium sensitivity receptor. **Assuming that the allotment is remaining. There are between 1 - 10 low sensitivity receptors <20 m from the proposed access route. Activities include the construction of a two lane carriageway (7.3 m wide and approximately 5.4 km long) and roundabout junction. A total of 8 culverts / bridges are also required. Road A is approximately 500 m from Marcham AQMA (declared for annual mean NO_2) at its closest point. Although in close proximity to the Westend allotments, it is considered that there are no proposed dust-generating construction activities that could not be managed using normal good practices (see IAQM construction dust guidance, 2016) to prevent significant effects at any off-site receptor. Given that relatively low numbers of plant and items of machinery would be used and the anticipated number of construction traffic is less than the criteria in the EPUK/IAQM guidance for requiring a detailed assessment, the potential effects would likely lead to a negligible change in air quality.	Air Quality
ENV19B	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the operation of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	A	Based on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), there is the potential for a significant effect, but can be appropriately mitigated. Residual significant effects are avoided or are not likely.	Based on the number and sensitivity of nearby receptors, it is considered that there are no proposed dust-generating operational activities that could not be managed using normal good practices to prevent significant effects at any off-site receptor. Given the anticipated volume of Scheme related traffic, the potential effects would likely lead to a negligible change in air quality. However, although residual effects are unlikely, the close proximity of Road A to Marcham AQMA means this Option is assigned an Amber score.	Air Quality
ENV20A	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the construction of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Construction activities associated with the access road in the vicinity of the A415 roundabout would lead to noticeable changes to the visual amenity of the local community on the eastern edge of Marcham and to a lesser extent affect the visual amenity of the community on the western edge of Drayton. This would in part be due to lighting during occasional night-time construction works.	Landscape & Visual
ENV20B	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the operation of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Traffic and highway infrastructure would lead to noticeable changes to the visual amenity of the local community on the eastern edge of Marcham in the short term and affect the visual amenity of the western edge of Drayton to a lesser extent (due to the presence of intervening pylons, overhead lines, traffic and highway planting along the A34). The effect on day-time visual amenity could be mitigated in the long term. However, effect of limited lighting at night on visual amenity in Marcham may not be possible to fully mitigate, although it would be seen in context of existing light pollution within Marcham and lighting associated with the A34 and Abingdon further east.	Landscape & Visual
ENV21A	Minimise impacts associated with solid discharge during construction.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road construction likely to be readily controlled using standard construction mitigation	Pollution
ENV21B	Minimise impacts associated with solid discharge during operation.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road operation likely to be readily controlled using standard mitigation	Pollution
Community and Planning Considerations						
CPC1	Distance to the nearest property that will stay during construction (metres)	GIS	A	Between 251m and 500m from the nearest property	Nearest property is 380m away	Socio-Economic
CPC2	Minimise impacts on local community during construction associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during construction	Construction of the new road may result in disruption for those traveling to/from Marcham Church Of England Primary School which is approximately 500m west of where the proposed road meets the A415. Part of the A415 Marcham Road may be shut or traffic may be limited to facilitate construction. With secondary schools within Abingdon it is expected that those who live in Marcham travel via the A415 to school. Users may experience disruption (delays) from potential closures. Abingdon hospital lies east of the new road and potential disruption of this road may affect ease of access for medical facilities. Construction of the A415 to SESRO Road A may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). Mitigation minimising disruption to schools and hospitals is recommended.	Socio-Economic

CPC3	Minimise impacts on local community during operation associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during operation	Operation of the A415 to SESRO Road A does not directly affect community assets. The road itself when complete does result in the severance of multiple PRoWs. Although these PRoW are away from residential areas, they could link Drayton to Marcham and community assets in each area (schools). It is possible to mitigate this impact by maintaining crossings for the PRoW.	Socio-Economic
CPC4A	Are public rights of way (PRoW) disrupted or adversely affected?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Recreational resources / rights of way of local importance are disrupted or affected. The site is likely to affect public rights of way	Construction and operation of the A415 to SESRO Road A may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to mitigate this impact by maintaining a crossings for the PRoW.	Socio-Economic
CPC4B	Are there opportunities to create or improve linkages of Public Rights of Way (PRoW) and recreational routes?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Links to a recreational resource / right of way of local importance can be enhanced	Construction and operation of the A415 to SESRO Road A may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to not only mitigate this impact but to enhance the crossing and create a path between Drayton and Marcham that attracts use. The PRoW will also link with the old and proposed WB canal path therefore mitigation should consider this potential benefit or negative impact if not addressed.	Socio-Economic
CPC5	Maximise potential opportunity for recreational benefits	GIS analysis of PRoW, open spaces, cycle routes, canals, other forms of regional/nationally important receptors (eg National Cycle Routes), and community assets.	A	Option allows some additional recreational benefits to be realised	Construction and operation of the A415 to SESRO Road A may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to not only mitigate this impact but to enhance the crossing and create a path between Drayton and Marcham that attracts use. The PRoW will also link with the old and proposed WB canal path therefore mitigation should consider this potential benefit or negative impact if not addressed.	Socio-Economic
CPC6	Support the realisation of socio-economic incentives on SESRO, including employment, skills, tourism, sustainable travel, connecting people with nature and environmental education	GIS analysis of footprint, community assets, private residents, and businesses. Also awareness of overall project objectives is needed to conclude if the designs align with these.	A	Site supports some of the social-economic incentives of the overall scheme	Construction of the new road may affect operation/attendance of key socio-economic assets (schools in Marcham, Abingdon and Drayton). Abingdon hospital lies east of the new road and potential disruption of this road may affect access to medical facilities. Construction of the new road facilitates wider socio-economic goals of the project (employment, education etc) but has some potential to create temporary disruption on roads and permanent disruption on PRoW if not mitigated correctly.	Socio-Economic
CPC7	Minimise overall SESRO Order Limits extent and land acquisition, without compromising SESRO needs and project benefits	Spatial comparison of land that would likely be included in the DCO Order Limits, including construction working areas, access and highways or PRoW interactions.	A	Requires minor additional Order Limits extent	Partially lies within the SESRO safeguarded area in the VoWHDC Local Plan. Is the longest road option which would require greater Order Limits extent.	Consenting
CPC8	Aim for consistency with published and (insofar as possible) emerging Local Plan land use allocations	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in existing and any emerging Local Plan documents and any Supplementary Planning Documents.	G	Low or no impact	Partially lies within the SESRO safeguarded area in policies CP14 and CP14a of the VoWHDC Local Plan. Also lies within an area safeguarded for flood risk management under policy CP14, but there is potential for the road embankment to be used in a flood alleviation scheme, so not necessarily a conflict. Avoids the area safeguarded for South Abingdon-on-Thames Bypass in the current VoWHDC Local Plan, but conflicts with the proposed revised safeguarded area (now referred to as the South Abingdon Movement Corridor) under Policy ID3 in the consultation draft Joint Local Plan 2041. Also lies within area safeguarded for flood risk management (policy IN7) in consultation draft Joint Local Plan 2041. Avoids the Westend Allotments. No land use allocation conflicts with the Oxfordshire County Council Minerals and Waste Local Plans. Not within the area of the South Oxfordshire District Council Local Plan.	Consenting
CPC9	Aim for consistency with any adopted Neighbourhood Plan policy applicable to the land area affected	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in any made Neighbourhood Plan.	G	Low or no impact	The road lies within both the made Drayton Neighbourhood Plan (adopted July 2015) and the made Wootton and St Helen Without Neighbourhood Plan (adopted December 2019). The Drayton NP outlines traffic as a problem in the Parish; when there are incidents on the A34, the B4017 that goes through the middle of Drayton is used as a relief road. Providing an alternative route to the A34 may help relieve this pressure. The Wootton and St Helen Without NP also recognises traffic to be a challenge and that transport infrastructure is considered to be inadequate. Traffic is also impacting the character of the Parish. However, as the road only enters the southern-most part of the designated Parish area, it is unlikely to have an impact (positive or negative) on traffic.	Consenting
CPC10	Avoid development of infrastructure within specifically designated areas or their setting, as applicable (e.g. Green Belt, AONB, Common Land, Open Space)	Spatial comparison with designated sites, their settings, and the nature of development works expected.	G	Does not require development of above-ground infrastructure within these designations or development likely to have more than a negligible effect on the setting (where applicable)	Not located within a specifically designated area, such as Green Belt, AONB, Common Land or Open Space.	Consenting
CPC11	Avoid encroachment on any safeguarded land in minerals and waste policy, unless the minerals can be beneficially utilised as a result	Spatial comparison of allocated sites and review of policy wording in existing and any emerging Waste and Minerals Local Plan documents.	G	Low or no impact	Not located in minerals safeguarding area or on a site allocated for minerals or waste uses.	Consenting

CPC12	Ability to integrate with existing nationally-significant infrastructure, statutory undertakers' major infrastructure, or any proposed future Nationally Significant Infrastructure Projects (NSIP) (such as that of National Highways, Environment Agency, Network Rail)	Review of NSIP projects on PINS's register; review of Network Rail and National Highways investment plans; spatial review of statutory undertakers' assets.	G	Low or no interaction with existing infrastructure or proposed Nationally Significant Infrastructure Project (NSIP)	No NSIPS currently registered. No known proposals from Network Rail or National Highways. The National Highways RIS3 Investment Plan will be published in 2024 which will detail the A34 improvement project. Potential to work with the Abingdon Flood Alleviation Scheme (storage options under consideration by the Environment Agency and as safeguarded under VoWH Local Plan policy CP14) rather than displacing it. Existing gas line is adjacent to road A, but does not cross it. A high voltage mains line does cross road A in two locations. An electric line also crosses road A in two points and a water line in one location. Road A does not interact with the area safeguarded for the potential future Marcham Bypass or South Abingdon-on-Thames Bypass and the revised safeguarded area under Policy ID3 in the draft Joint Local Plan 2041.	Consenting
CPC13	Minimise the consenting complexity due to the need for additional consents and licenses that may be required outside the Development Consent Order (DCO), e.g. additional Flood Risk Activity Permit, Environmental Permit, abstraction/discharge Licence, European protected species licence, etc	Review of the nature of expected development works against the list of other consents and licenses developed at Gateway 2.	A	One or more additional consent/license required	Roads A, B, C and D cross over multiple PRoW and so a Temporary Traffic Regulation Order may be required, although this can potentially be included within the DCO application. A section 278 highways agreement, street works notice and highway works permit will also likely be necessary, although could also be included within the DCO. The location of Roads A, B, C and D within areas of Flood Zone and Abingdon Flood Alleviation Scheme may also require a Standard or Bespoke Flood Risk Activity Permit or a Flood Risk Activity Exemption permit from the Environment Agency, but these will be required anyway for other reservoir works. Likelihood of at least one European protected species relocation licence required.	Consenting
CPC14	Avoid or minimise the need for any consequential development consenting (i.e. displacement or alteration of other development)	Review of existing development within the likely land-take, its nature and scale.	G	No existing development requires planning permission to relocate or alter	Existing high-voltage, electric lines and water line will need to be diverted as they pass through Road A. However, this can form part of the DCO associated development or potentially be delivered through statutory undertaker permitted development.	Consenting
CPC15	Minimise interfaces/reliance on external governing/third parties (e.g. Removing the canal removes a stakeholder, reducing interfaces and permissions required from Network Rail, National Highways, National Grid)	Review GIS layers for services against the options. Expert Judgement.	A	Several manageable interfaces with others	All options score similarly because each would have interactions. Option A may have an interface with South Abingdon Bypass and Abingdon FSR but these may introduce benefits.	Consenting
CPC17	The option provides economic benefits by directing traffic through local town centres which will boost their footfall and potential for people to stop and utilise their local economy	Expert judgement	G	The routes for this option do not provide a bypass of local towns and villages. Therefore, this option may boost the local economy of these towns and villages as people may be more likely to stop and visit the local businesses here.	Access road to site only.	Transport Planning
CPC18	Influence the location and layout of development to maximise the use and value of existing and planned sustainable transport investment	Expert judgement	A	Option partially supports existing and planned public transport infrastructure between key destinations	Access road is longer route to accommodate flood defence scheme. Making journey by road longer for bus travel and ped/cyclist using shared footway along the road route. Junction to access the road is slightly nearer to Marcham than Abingdon.	Transport Planning
CPC19	Maximise the benefits of travel for non-motorised users between key destinations	Expert judgement	A	Provides some routes that would encourage some users to walk, cycle or use bridleways but could be improved further to prioritise a modal shift away from trips undertaken by private vehicles	Access road to site only. Shared use footways beside the road may encourage users to use non-motorised transport to get to the reservoir or other recreational facilities.	Transport Planning
Property & Land Acquisition						
PRP1	Minimise loss of sensitive properties, i.e. residential, commercial, green belt, common land, historical or community assets due to project delivery	Review Land allocation mapping on ArcGIS.	G	No permanent or temporary loss of sensitive properties	Land is all agricultural.	Property & Land Acquisition
PRP2	Minimise loss of land allocated within the Local Plan for alternative higher value / social / cultural value uses, e.g, residential, historical or community assets due project delivery	Review Land allocation mapping on ArcGIS.	G	No permanent or temporary loss of allocated land for higher value or social value properties	The review did not identify any loss of the uses contained in the Criteria Description.	Property & Land Acquisition
PRP3	Minimise permanent loss of best and most versatile agricultural land (grades 1, 2 and 3)	Review of agricultural grading layer on ArcGIS, based on 2019 Provisional Agricultural Land Classification	A	Results in loss of any Grade 2 agricultural land or >50% Grade 3 agricultural land	Agricultural land approximate percentages are as follows. grade 2 = 11.5% grade 3 = 63.5 % grade 4 = 25% Due to the presence of Grade 2 ALC, the RAG score is Amber.	Property & Land Acquisition
PRP4	Assessment of Land and Property asset costs and associated compensation due under the Compensation Code	Review of land use / designation on ArcGIS	G	Land acquisition costs likely to be relatively low.	Agricultural land values can range from £8,000 - 14,000 in the area. Landowners may be eligible for Severance claims depending on design and farm practices.	Property & Land Acquisition
PRP5	Assessment of Special Category Landowners (SCLs), utility infrastructure, national asset protection agencies and Crown bodies	Review of affected landowners	G	No SCL on identified option	Sensitive Landowners only: Abingdon Town Council.	Property & Land Acquisition
PRP6	Minimise disruptions of landowners access to their land required for temporary works	Review location in conjunction with existing road network	G	Assumption that landowners will be able to access their land during construction and operational phases.	Landowners should be able to access their land during construction and operation phases.	Property & Land Acquisition

Appendix B SESRO Access Road Option B Criteria Workbook

A415 to SESRO Road B

Criteria code	Criteria Description	Method of Assessment	RAG	Description of RAG	Narrative	Sub-theme
Constructability						
CON1	Safety - Risk of endangering construction workers or members of the public during construction e.g. water, ground, height, rail, road and utilities	Look at programme and list types of construction involved. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	A	Works can be constructed safely but enhanced control measures required	Option B requires 7 crossings and requires 1.7km of 132kV HV Overhead diversions and a gas diversion over the ADC. These would increase the risk of endangering workers and require enhanced measures, and is therefore rated amber.	Health and Safety
CON2A	Programme - Duration, longest /shortest, but also consider whether the longer duration has an impact on the overall scheme programme	Compare differences in the programmes which would materialise from different options. Consider earthworks seasons.	G	Unlikely to extend the duration of the relevant area of works (e.g. road, rail siding or intake/offtake construction) compared to the Gate 2 SESRO programme and unlikely to impact on overall SESRO Gate 2 programme.	Option B has a length of 2.7km and an estimated 92,500m3 of fill. Option B has an alignment which is close to the A34, which brings in the opportunity for the bridge across the ADC to also be used for the gas diversion and (potentially) to help facilitate the temporary diversion of the A34 to allow the construction of the ADC box culvert.	Programme
CON2B	Programme - Opportunities for construction programme acceleration through efficiencies	Compare differences in the programmes which would materialise from different options.	G	The option has the potential to introduce programme efficiencies and reduce the construction programme	If construction access can be temporarily provided from the A34 layby then construction traffic can be allowed from both ends of the road. In addition to this, for Option B, the alignment provides an opportunity to reduce the construction programme associated with the gas diversion and the ADC box culvert below the A34.	Programme
CON2C	Programme - Dependencies i.e. proximity or physical relationships between elements of scope that introduce programme dependencies	Is the options on the critical path? Will it impact other critical activities?	A	Several major dependencies/ multiple minor dependencies	The A415 to SESRO Access Road, and other haul roads need to be constructed prior to construction of the rail sidings. This option, therefore, has multiple minor dependencies and scores amber.	Programme
CON2D	Programme - Risk	Are there items in the construction which have a significant programme risk	A	Moderate programme risk	Option B has some utility diversion requirements, and is in a flood zone. It is therefore considered to have moderate programme risk and is rated amber.	Programme
CON3A	Logistics - Space available for construction and materials storage	Determine space constraints using GIS and options layouts from option definition.	G	Adequate space	Option B has adequate space on the west side which could be used for construction compounds and Replacement Floodplain Storage (which will be needed to account for the road embankment which is located within the current floodplain).	Logistics
CON3B	Logistics - Suitable and efficient access for construction workers, deliveries and waste removal including minimisation of lengths of new roads for access during construction	Determine method of access using GIS and options layouts from option definition.	G	Adequate access is available, and only short length (relative) of road is required for construction	A415 to SESRO Access Road itself is providing access for construction workers and deliveries, therefore, there is considered to be no significant difference between the options for this criteria.	Logistics
CON3C	Logistics - Import of materials or resources during construction	Use quantity estimates to assess different options.	A	Moderate amount of import materials required	The A415 to SESRO Access Road requires the import of materials for the road surface. The earthworks required for the road embankment are assumed to be sourced from the site. There is considered to be no significant difference between the options for this criteria. This option is assessed as amber because access to construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.	Logistics
CON3E	Logistics - Vehicle movements	Use vehicle movement estimates to assess different options.	A	Construction likely to add vehicle movements.	The number of vehicle movements will be related to the length and earthworks required. This option is assessed as amber because access to the construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.	Logistics
CON4A	Construction Complexity - Temporary conditions/works requirements e.g. embankment slope stability and moisture outside of placement seasons.	Expert Judgement	G	Temporary Works requirements minimal and can be used in the permanent state and no extension to the programme	This option is assessed as green because the temporary state can be easily adopted to a permanent state i.e. an initial subbase may be laid on top of an embankment and then later used as part of the permanent state. Option B has 7 crossings, 3 of which are likely need to a bridge, but other options have a similar number.	Construction complexity
CON4B	Construction Complexity - Location conflict/opportunity with another engineering component of the scheme or other SRO/non-SRO schemes, e.g. Severn to Thames Transfer (STT), Thames to Southern Transfer (T2ST), TW Swindon and Oxfordshire supply zone transfer, Transfer to Farmoor Reservoir	Expert judgement and knowledge of surrounding schemes	A	Location / layout of the option neither clashes nor provides an opportunity to be developed with another component of this scheme (or another scheme)	Potential for conflict with / interaction with the proposed South Abingdon Bypass Scheme and / or the Abingdon Flood Alleviation Scheme. At this stage, these can be viewed as a conflict or an opportunity. Unlikely to affect Marcham Bypass. The junction would need to take Dalton Barracks traffic into consideration in the design of the roundabout.	Construction complexity
CON4C	Construction Complexity - Minimise the number and complexity of additional structures/assets required or modifications to the existing structures/assets in order to facilitate the option, e.g. bridges, culverts, crossings	Determine using GIS and options layouts from option definition.	A	Option requires a moderately complex (mitigation likely) and/or moderate number of additional structures and/or modification to existing structures.	Option B scores amber as it requires a moderate number of new structures (7 crossings)	Construction complexity
CON5A	3rd Party Impact - Potential to disrupt existing road network during enabling works and construction	Expert judgement	A	Disruption likely to be moderate	This option is assessed to have a moderate impact on traffic because construction material will be delivered to site by road; however, the rate of deliveries is expected to be on average below 20 HGVs per day, assuming reservoir materials are brought in via train.	3rd Party Impact
CON7A	Ground - Terrain of site, and implications for the need for earthworks and engineered slopes	Use of lidar and civil 3D models to assess amount/location of earthworks required	G	Terrain is favourable to the design of assets and therefore reduces the amount of earthworks required	Option B crosses the relatively flat River Ock floodplain. South of the River Ock the road along the Option B alignment would route close to the A34 where it would rise up over a hill. Option B requires an estimated 92,500m3 of fill material.	Construction complexity
CON7B	Ground - Risk of unexpected conditions	Use of expert judgement based on comparable areas	A	Moderate exposure to risk of unexpected ground conditions.	The road option passes through the undeveloped floodplain of the River Ock, so there is a moderate risk for unexpected ground conditions. There is a possibility of high water table from the River Ock.	Construction complexity
CON7C	Ground - Impact of ground conditions on the complexity of design and construction	Use of expert judgement	G	Ground conditions are unlikely to increase the complexity of design and construction with likely only a minimal (if any) impact on cost or requirement for materials that are difficult to source	The road option passes through the undeveloped floodplain of the River Ock, so there is a moderate risk for unexpected ground conditions. Ground conditions are unlikely to increase the complexity of design.	Construction complexity
Operability						

OPS1A	Safety - Risk of endangering operational staff, visitors or members of the public during operation	Look at operational activities and public access. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	G	Works can be operated safely without enhanced control measures	The road design follows best practice such as the Design Manual for Roads and Bridges regarding elements such as the speed limit, bend radii, gradients and drainage.	Health and Safety
OPS1B	Safety - Access and egress for operational staff, visitors, deliveries and waste removal during normal operations and emergencies	Tunnel silt issue to be considered by expert judgement	G	Access/egress can be provided	The road design follows best practice such as the Design Manual for Roads and Bridges, allowing for sufficient access/egress in emergencies.	Health and Safety
OPS2A	Maintenance - Ease of maintenance	Expert judgement	G	Majority of maintenance activities could be undertaken during limited closure periods and / or with limited disruption	This road option will be accessible for maintenance. It is anticipated that it could be closed for maintenance during times of low traffic movement (i.e. at nights and/or weekdays), or be undertaken so that a single lane is kept open to minimise disruption.	Operational Complexity
OPS4A	Reliability - Footprint of the option within flood zones (as an indication of the potential for damage and the challenge of operation / maintenance during flood events)	Review GIS supported by expert judgement	A	Option is within the flood zone, however damage is not considered to be a significant risk	Option is within the flood zone, however damage is not considered to be a significant risk as option will be designed (i.e. elevation, drainage) to withstand predicted flooding without damage.	Operational Resilience
OPS4B	Reliability - The option does not have a single point of failure but rather includes backup infrastructure so that it can remain in operation if the primary infrastructure is unavailable, e.g. siphons in addition to tunnel for emergency discharge or alternative road route to reservoir crest	Expert judgement	A	There is a single point of failure but mitigation measures can be introduced to allow for continued operation, which might be a delayed or reduced service	In a scenario where the A415 to SESRO Access Road is out of operation it is assumed that access would be provided for operational vehicles via retained haul roads and the proposed local car park at the end of the Hanney Road "stub" outside of Steventon.	Operational Resilience
OPS5A	Adaptability - Space available for future expansion of social / recreation infrastructure	Expert judgement	G	Opportunity / adequate space for envisaged expansion	No expansion envisaged; however no constraint identified to future expansion, albeit impact on the floodplain would need to be assessed during design.	Operational Resilience
OPS5B	Adaptability - Flexibility for future modifications e.g. increasing reservoir storage volume, rail station at wantage and grove, construction of Marcham Bypass	Expert judgement	G	Option includes a large degree of flexibility for future modifications	Option B alignment offers the opportunity for dual functions (Abingdon Flood Alleviation Scheme and / or South Abingdon Bypass). The junction for Option B also aligns with the proposed junction for the Dalton Barracks housing development.	Operational Resilience
OPS8A	3rd Party Impact - Potential to disrupt existing road network during operation	Expert judgement	A	Disruption likely to be limited	The Option B junction location was tested with indicative traffic flows, which indicated they can be managed appropriately. However the junction coincides with the proposed Dalton Barracks housing development junction which provides both opportunities and risks.	Transport Planning
OPS8C	3rd Party Impact - Option facilitates infrastructure for other modes of transport, including pedestrians, cyclists and other non-motorised users	Expert judgement. Review GIS for PRoW, cycle routes, etc.	G	Option provides segregated cycle facilities, a footway that is wider than 2m, and suitable crossing infrastructure is provided for pedestrians and cyclists. Additional Bridleways or improvements or maintenance provided to existing bridleway routes are also included	PRoWs can be linked across the site creating new routes to surrounding area. The options are considered to score similarly against this criteria. Options A & B leave more land to the west which potentially leaves more locations for additional PRoWs that would not need to cross the road.	Transport Planning
OPS8D	3rd Party Impact - Congestion at the relevant junctions for all movements, and the effective use of the transport network through innovative solutions	Expert judgement	A	Option provides a partial solution to delivering roads that will be effectively able to deal with traffic upon completion. However, the junctions designed may be unable to cope with traffic flows in future years.	Initial modelling illustrates capacity at highway junctions reduces over time, however, this can be managed.	Transport Planning
OPS8E	3rd Party Impact - Impact on journey time reliability	Expert judgement	A	Option is not expected to either increases or improve journey times for road users on the road network	Initial modelling illustrates capacity at highway junctions reduces over time, however, this can be managed.	Transport Planning
Relative Costs						
COS1	Capex cost of the option	Cost estimate calculation for each option.	G	CAPEX estimated to result in an increase of <1% of the CAPEX for the overall SESRO project compared to the lowest cost option	Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 0.4% of the total SESRO costs. Option B results in a total project cost of 0.04% more than the lowest cost option.	Cost
COS3	Opportunity for cost-sharing with other SROs, NSIPs and local non-SRO schemes/plans, e.g. STT, T2ST, SWOX/Farmoor, Abingdon flood storage	Cost estimate calculation for each option.	G	Multiple opportunities identified for cost saving.	Option B provides an opportunity for cost-sharing with the South Abingdon Bypass scheme and / or the Abingdon Flood Alleviation Scheme.	Cost
Carbon Costs						
CAR1	Carbon costs associated to the Capex of the option	Carbon estimate calculation for each option.	G	Emissions (tCO2e) estimated to result in an increase of <1% of the emissions (tCO2e) for the overall SESRO project compared to the lowest emissions (tCO2e) option	Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option B results in a total project carbon of 0.1% more than the lowest carbon option.	Carbon
CAR3	Opportunity for mitigation e.g. smaller earthworks may lead to less carbon	Carbon estimate calculation for each option.	A	Limited likelihood and magnitude of mitigation opportunity.	Option B has an average route length. The route is adjacent to the replacement flood storage area which could an offer an opportunity to rationalise the earthworks to lead to the consumption of less carbon. The route also passes close to the A34 which brings in the opportunity for the bridge across the ADC to also be used for the gas diversion and (potentially) to help facilitate the temporary diversion of the A34 to allow the construction of the ADC box culvert.	Carbon
Environmental Performance						
ENV1A	Minimise impacts on Special Area of Conservation (SAC)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SAC's or potential SAC's within the boundary of the proposed A415 option B road. The closest SAC to the road is Cothill Fen SAC located approximately 2.8Km to the north.	Biodiversity and Nature Conservation
ENV1B	Minimise impacts on Special Protection Area (SPA)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SPA's or potential SPA's within the boundary of the proposed A415 option B Site. The closest SPA to the proposed road is Thames Basin Heaths SPA located approximately 43Km to the south-east.	Biodiversity and Nature Conservation

ENV1C	Minimise impacts on Ramsar	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no Ramsar sites or potential Ramsar sites within the boundary of the proposed A415 Option B. The closest Ramsar site to the Road is South-west London Waterbodies located 58Km to the south-east.	Biodiversity and Nature Conservation
ENV1D	Minimise impacts on Site of Special Scientific Interest	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	Road is located within the Impact Risk Zone for Barrow Farm Fen SSSI. However, impacts are considered unlikely due to the distance the works are located away from the SSSI.	Biodiversity and Nature Conservation
ENV1E	Minimise impacts on National Nature Reserve	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no NNR within the boundary of the proposed A415 option B site. The closest NNR to the road is located 2.7Km to the north. Cothill NNR.	Biodiversity and Nature Conservation
ENV1F	Minimise impacts on Local Nature Reserve (LMN)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no LNR within the boundary of the proposed A415 Option B. The closest LNR to the Road is located 4.7Km to the east of the site. The site is called Abbey Fishponds LNR.	Biodiversity and Nature Conservation
ENV2A	Minimise impacts on Ancient Woodland	Natural England Ancient Woodland Maps and Professional Judgement.	G	No ancient woodland impacted	Historic mapping indicates that there is no ancient woodland present on-site	Biodiversity and Nature Conservation
ENV2B	Minimise impacts on Ancient and Veteran Trees	Woodland Trust Ancient Tree Inventory map search and professional judgement	A	Development in close proximity with potential indirect impact to ancient or veteran trees	There are no ancient or veteran trees recorded by the Woodland Trusts Ancient Tree Inventory on or close to this option. However, survey may identify trees that could be classified as ancient or veteran. As such, this option scores amber on a precautionary basis pending survey.	Biodiversity and Nature Conservation
ENV2C	Minimise impacts on Protected Trees	Check against published TPO dataset.	G	No protected trees impacted	No protected trees would be impacted.	Landscape & Visual
ENV2D	Minimise impacts on vegetation (including trees, woodland, hedges and shrubs)	Check against baseline resources and based upon high level knowledge of site from previous site visits. Professional judgement.	G	No direct impact on vegetation which is of high arboricultural/amenity value (A or B grade) or biodiversity habitat in good condition. OR Limited direct impact on vegetation which is of lower arboricultural/visual amenity value (e.g. C grade) or biodiversity habitat in poor condition.	Construction of the road will require the removal of vegetation belts at several field boundaries, including a limited section of a woodland belt. It is assumed that few if any A or B grade trees are likely to be impacted.	Biodiversity and Nature Conservation and Landscape
ENV3	Minimise impacts on Local Wildlife Sites (LWS)	Professional Judgement and LWS Citation provided by TVERC.	G	No impacts to LWS	There are no LWS located within or adjacent to the boundary of the A415 Option B. The closest LWS to the road is located approximately 2km to the west (Marcham Salt Spring).	Biodiversity and Nature Conservation
ENV4A	Minimise impacts on Scheduled monuments or activities which could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest scheduled monument is the Sutton Wick settlement site which lies 700m east of the option.	Historic Environment
ENV4B	Minimise impacts on listed buildings or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	Route option is approximately 700m west of the nearest listed building which lies in Drayton.	Historic Environment
ENV4C	Minimise impacts on Registered Parks and Garden or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The Albert Park RP&G lies 1.5km to the north-east in Abingdon.	Historic Environment
ENV4D	Minimise impacts on Registered Battlefields or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest Registered Battlefield of the 1643 battle of Chalgrove lies over 15km east of the proposed route alignment.	Historic Environment
ENV4E	Avoid impacts on World Heritage Sites or activities that could lead to a loss of significance, including setting	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	Blenheim Palace World Heritage Site lies 18km north of the proposed route alignment..	Historic Environment
ENV4F	Minimise impacts on conservation areas which could result in loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The Drayton conservation area is the closest to this route alignment at 700m to the east. Its position relative to the option means no visual intrusion is likely.	Historic Environment
ENV5A	Minimise loss to non-designated built heritage	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Extensive loss of non-designated built heritage of medium value within the permanent infrastructure zone and adverse changes to the setting within a 500m area from the edges of the permanent infrastructure OR more limited effects on remains of non-designated built heritage of high value	There are no non-designated historic structures recorded along the route alignment, with the nearest being an historic mill on the River Ock just under 500m to the east.	Historic Environment

ENV5B	Minimise loss to paleoenvironmental remains	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	A	Extensive scale of loss or damage to medium value remains within the construction area and adverse changes to similar buried remains in a 1km area around the permanent infrastructure from temporary and permanent changes to local hydrogeological regimes OR more limited effects on remains of high value	The route option crosses the River Ock and buried paleoenvironmental remains are likely to be present, but their extent and significance is unknown.	Historic Environment
ENV5C	Minimise loss to non-designated historic landscapes	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or extensive changes to low value non-designated historic landscapes within the construction area and extensive changes to the setting of the same resource outside the permanent infrastructure OR more limited effects on non-designated historic landscapes of medium value	There are no non-designated historic landscape features along the route alignment or within 500m of it	Historic Environment
ENV5D	Minimise loss of non-designated archaeological remains	Professional judgement, incorporating the use of the IEMA's Principles of Cultural Heritage Assessment in the UK and the Chartered Institute for Archaeologists standard and guidance document for desk based assessment	A	Permanent infrastructure and construction area will result in the loss and / permanent damage to non-designated buried and extant archaeological remains worthy of regional significance which can only be partially mitigated through preservation by record	The route passes through an Iron Age and Romano-British cropmark complex (HER 15283) and potential settlement, but the value of these assets is currently unknown and a regional value has been assumed given a worst case scenario. The route also crosse the historic Wiltshire-Berkshire Canal and its partially extant structural remains. The Canal might warrant a regional heritage value	Historic Environment
ENV6A	Minimise loss of fluvial flood storage within Flood Zone 2 or 3	Measure using GIS	A	Site is within flood zone 2 and 3 but loss of storage is minor or mitigation is available	Option is not considered to have a significant impact on fluvial flood risk, 940m length of road is sited within flood zones but sufficient space has been provided for Replacement Floodplain Storage along the watercourse diversions.	Flood Risk
ENV6B	Minimise impacts of pluvial flood risk.	Expert judgement	G	No predicted impacts on pluvial flood risk	Option is not considered to have a significant impact on pluvial flood risk as it is a single carriageway. The options are considered to score similarly against this criteria.	Flood Risk
ENV6C	Minimise impacts of groundwater flood risk.	Checking existing national and local records	G	No predicted impacts on groundwater flood risk	Option is not considered to have a significant impact on groundwater flood risk. The options are considered to score similarly against this criteria.	Flood Risk
ENV7A	Minimise disturbance of potentially contaminated land	Checking existing national and local records	G	Minimal or no disturbance of contaminated land unlikely to cause cost or program implications or harm to potential receptors. No remediation required	There are unlikely to be contamination sources within 250m of this option other than the Marcham road, the infilled canal which crosses the site and potentially the A34.	Land
ENV7B	Minimise disturbance of potentially contaminated land specifically in relation to authorised and historic landfills	Checking existing national and local records	G	Not within authorised and historic landfills or previous industrial sites or within 250m of authorised and historic landfills or previous industrial sites	There is no authorised or historical landfill within 250m of this option	Land
ENV8	Minimise disturbance of land with known potential for Unexploded Ordnance (UXO)	Checking existing national and local records	A	Disturbance of a low quantity of UXO which can be easily managed / remediated. Unlikely to have significant cost or program implications	A pre-desk study assessment from Zetica acquired for gate 2 identified various potential UXO risks across the SESRO area, therefore, recommend a detailed UXO survey of the area. Specifically an early 20th century rifle range was in use in the area of this option.	Land
ENV9A	Minimise loss of terrestrial priority habitats (use narrative to describe type and quantum)	Use of aerial imagery, MAGIC maps and Professional Judgement	A	Priority habitat directly impacted but mitigation feasible	Construction of the road will require the removal of Floodplain Grazing Marsh, Deciduous Woodland and Hedgerow which are all listed as Priority habitats. The River Ock will also be crossed which is also a Priority habitat.	Biodiversity and Nature Conservation
ENV9B	Minimise loss of aquatic priority habitats (use narrative to describe type and quantum)	Professional judgement based on knowledge of Water Framework Directive.	A	Priority habitat directly impacted but mitigation feasible	Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the any WFD waterbody to reduce potential impacts.	Aquatic Environment
ENV10A	Reduce effects on North Wessex Downs Area of Outstanding Natural Beauty (AONB) and its setting	Professional judgement.	A	AONB and its setting likely to be affected. Effect is unlikely to be significant.	The introduction of traffic, highway infrastructure and limited lighting into the rural landscape would be within the context of the adjacent A34 and Marcham Road highway corridors. However, the interruption of small to large-scale field pattern divided by hedgerows and tree/woodland belts along watercourses would erode a key characteristic which contributes positively to the local landscape character and setting of the North Wessex Downs AONB. Effect on landscape character and tranquillity of AONB unlikely to be significant due to distance and presence of existing highway infrastructure in the immediate vicinity.	Landscape & Visual
ENV10B	Reduce effects on local landscape character	Professional judgement.	A	Effect on local landscape character is unlikely to be significant.	The introduction of traffic, highway infrastructure and limited lighting into the rural landscape would be within the context of the adjacent A34 and Marcham Road highway corridors. The level of tranquillity, which also is affected by noise, would therefore only be slightly reduced. However, the interruption of small to large-scale field pattern divided by hedgerows and tree/woodland belts along watercourses would erode a key characteristic which contributes positively to the local landscape character. While effects on local landscape character may be significant in the short term, this could be mitigated in the long term, particularly given the presence of existing highway infrastructure and traffic on the A34.	Landscape & Visual
ENV11A	Reduce effects on panoramic views from national trail, open access land and important viewpoints in AONB	Professional judgement.	G	Panoramic views from national trail, open access land and important viewpoints in AONB unlikely to be affected or the proposal is likely to be barely discernible in views.	Given the distance, traffic and highway infrastructure on the new road is likely to be barely distinguishable from the A34 road corridor in panoramic views from The Ridgeway National Trail, especially when mitigation has established.	Landscape & Visual
ENV11B	Reduce effects on sensitive local visual receptors	Professional judgement.	R	Effect on local views of sensitive visual receptors likely to be significant.	Traffic and highway infrastructure is likely to be visible in local views from some PRoWs. There would also be some filtered views through existing vegetation from the western edge of Drayton, seen in the context of existing pylons, overhead lines and traffic on the A34. Effects on most views could be reduced in the long term, but some significant effects may remain.	Landscape & Visual
ENV12	Minimise disturbance/encroachment into Air Quality Management Area (AQMA)	Based on an understanding of the scale and nature of activities, air quality management areas (AQMAs) were identified in close proximity to the proposed works.	G	Site is located further than 1km from AQMA OR no construction traffic must go through an AQMA	Marcham AQMA is approximately 1.2 km W of the Road B access point. The anticipated construction and operational activities would likely lead to a negligible change in air quality (assuming construction traffic and the majority of tourists travel E along the A415).	Air Quality

ENV13	Minimise disturbance/encroachment into Groundwater Source Protection Zone (SPZ)	Magic maps	G	Site is within Zone 3 or not within a SPZ	Site is not within an SPZ.	Aquatic Environment
ENV14A	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Cow Common Brook and Portobello Ditch' WFD waterbody (GB106039023360) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14B	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ock and tributaries (Land Brook confluence to Thames)' WFD waterbody (GB106039023430) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - Crossing on River Ock is nearer to A34 crossing, on a straight section, reducing the area of impact. Any impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14C	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Thames (Evenlode to Thame)' WFD waterbody (GB106039030334) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14D	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Sandford Brook (source to Ock)' WFD waterbody (GB106039023410) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - The route has one crossings on the Sandford Brook WFD waterbody as well as surrounding tributaries. Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14E	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Childrey Brook and Norbrook at Common' WFD waterbody (GB106039023380) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14F	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ginge Brook and Mill Brook' WFD waterbody (GB106039023660) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14G	Option does not affect Water Framework Directive (WFD) Quality Elements within one of WFD waterbodies downstream of the River Thame to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives. These WFD waterbodies include: - Thames Wallingford to Caversham - WFD waterbody GB106039030331 - Thames (Reading to Cookham) - WFD waterbody GB106039023233 - Thames (Cookham to Egham) - WFD waterbody GB106039023231 - Thames (Egham to Teddington) - WFD waterbody GB106039023232	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV15A	Maximise potential for future environmental benefits (terrestrial), e.g. increase tree planting	Professional Judgement	G	Site allows substantial additional environmental benefits to be realised	Being a predominantly arable landscape there is plenty of opportunity for environmental enhancement through the planting of trees and creation of habitats with high distinctiveness. Also opportunity for the creation of wetland areas including wet woodland and ponds.	Biodiversity and nature conservation
ENV15B	Maximise potential for future environmental benefits (aquatic), e.g. increase wetlands area	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Site allows substantial additional environmental benefits to be realised	Connectivity through the watercourse and associated wetlands is crucial. Thus any road crossings will need to consider this appropriately and mitigation provided.	Aquatic Environment

ENV16	Maximise flexibility in routing diverted watercourses so their habitats can be of sufficiently high quality to contribute to catchment Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Site allows some flexibility in routing watercourses / Good quality habitat options are available	There appear to be no / minimal interaction conflicts with the Eastern Watercourse Diversion design, although there is a single watercourse crossing. Road crossings need to ensure sufficient light and connectivity through the structure. Preference is a clear span, bridge on all crossings of principal WFD waterbodies (blue line) but an appropriately sized box culvert is acceptable on other watercourses in the WFD catchment. Pipe crossings will be deemed to be unacceptable and should be avoided.	Aquatic Environment
ENV17	Minimise disturbance/encroachment into Local Geological Sites (LGS)	Checking existing national and local records	G	Site is located more than 250m from LGS	No LGS identified within 250m of the layout	Biodiversity and nature conservation
ENV18A	Minimise impacts associated with Noise and Vibration as a consequence of the construction of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment. Red band distance is from works site/road to the SOAEL+5dB, and Amber distance is from SOAEL+5dB to the SOAEL. Road Construction: Red 60m, Amber 61-99m, Green 100m. Construction Traffic: Red 40m, Amber 41-184m, Green 185m. Road Const. (bridge construction): Red 75m, Amber 81-124m, Green 125m. (NOTE: No sensitive properties have been identified within 125m of potential piling works at road bridges and significant effects are not anticipated. Distances referenced in the assessment are those measured between the proposed roads and receptors). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis (with >700 extra receptors included, namely at Diversion Road C, which is outside of Gate 2 Study Area).	G	Impacts unlikely, or adverse impacts are likely to be mitigated if they occur	The closest noise sensitive property is located over 350m from Access Road A415-SESRO Option B, as such, no significant adverse effects are predicted.	Noise
ENV18B	Minimise impacts associated with Noise and Vibration as a consequence of the operation of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment (inc. bunding around sidings). Red band is from works site to the SOAEL+5dB distance, and Amber is from SOAEL+5dB distance to the SOAEL. Rail Sidings: Red 675m, Amber 676-1209m, Green 1210m. This is based on worst-case activity, Material Handling, which includes potential for works between 06:00 to 07:00 and was assessed using night-time noise assessment criteria at Gate 2 as a precautionary approach. The noise emission for the activity is based on G2 assumptions, with update made following review by Costain (JB 05Jun). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis.	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	The closest noise sensitive property is located over 350m from Access Road A415-SESRO Option B, as such, no significant adverse effects are predicted.	Noise
ENV19A	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the construction of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	Road B is adjacent (<50 m) to Westend allotments, which is considered a low / medium sensitivity receptor. There are between 1 - 10 low sensitivity receptors <20 m from the proposed access route. Activities include the construction of a two lane carriageway (7.3 m wide and approximately 4.3 km long), roundabout junction and an exit to provide access to the proposed Dalton Barracks housing development. A total of 7 culverts / bridges are also required. Road B is approximately 1.2 km from Marcham AQMA at its closest point. Although in close proximity to the Westend allotments, it is considered that there are no proposed dust-generating construction activities that could not be managed using normal good practices (IAQM construction dust guidance, 2016) to prevent significant effects at any off-site receptor. Given that relatively low numbers of plant and items of machinery would be used and the anticipated number of construction traffic is less than the criteria in the EPUK/IAQM guidance for requiring a detailed assessment, the potential effects would likely lead to a negligible change in air quality. Based on its distance from the Marcham AQMA, it is considered more favourable than the other options.	Air Quality
ENV19B	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the operation of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	Based on the number and sensitivity of nearby receptors, it is considered that there are no proposed dust-generating operational activities that could not be managed using normal good practices to prevent significant effects at any off-site receptor. Given the anticipated volume of Scheme related traffic, and based on its distance from the Marcham AQMA, the potential effects would likely lead to a negligible change in air quality and it is considered more favourable than the other options due to distance from the AQMA.	Air Quality
ENV20A	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the construction of the option	Professional judgement.	G	Barely perceptible changes to visual amenity, with no or little effect on local community	Construction activities would have a limited effect on the visual amenity of the community on the western edge of Drayton, due to the intervening pylons, overhead lines, highway vegetation and traffic on the A34. There would be no or little effect on the visual amenity of other local communities.	Landscape & Visual

ENV20B	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the operation of the option	Professional judgement.	G	Barely perceptible changes to visual amenities, with no or little effect on local community	Traffic and highway infrastructure would have a limited effect on the visual amenity of the community on the western edge of Drayton, due to the intervening pylons, overhead lines, highway vegetation and traffic on the A34. There would be no or little effect on the visual amenity of other local communities.	Landscape & Visual
ENV21A	Minimise impacts associated with solid discharge during construction.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road construction likely to be readily controlled using standard construction mitigation	Pollution
ENV21B	Minimise impacts associated with solid discharge during operation.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road operation likely to be readily controlled using standard mitigation	Pollution
Community and Planning Considerations						
CPC1	Distance to the nearest property that will stay during construction (metres)	GIS	A	Between 251m and 500m from the nearest property	Nearest property is 380m away	Socio-Economic
CPC2	Minimise impacts on local community during construction associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during construction	Construction of the A415 to SESRO Road B may result in disruption of vehicle movement in Marcham Road, linking residents of Marcham to hospitals and schools in Abingdon. Abingdon hospital lies east of the new road and potential disruption of this road may affect ease of access for medical facilities. With state and independent senior schools in Abingdon (east to the construction site) there may be disruption for attendees. Construction of the A415 to SESRO Road B may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). Mitigation minimising disruption to schools and hospitals is recommended.	Socio-Economic
CPC3	Minimise impacts on local community during operation associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during operation	Operation of the A415 to SESRO Road B does directly not affect community assets. The road itself when complete does result in the severance of multiple PRoWs. Although these PRoW are away from residential areas, they could link Drayton to Marcham and community assets in each area (schools). It is possible mitigate this impact by maintaining crossings for the PRoW.	Socio-Economic
CPC4A	Are public rights of way (PRoW) disrupted or adversely affected?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Recreational resources / rights of way of local importance are disrupted or affected. The site is likely to affect public rights of way	Construction and operation of the A415 to SESRO Road B may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to mitigate this impact by maintaining crossings for the PRoW.	Socio-Economic
CPC4B	Are there opportunities to create or improve linkages of Public Rights of Way (PRoW) and recreational routes?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Links to a recreational resource / right of way of local importance can be enhanced	Construction and operation of the A415 to SESRO Road B may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to not only mitigate this impact but to enhance the crossing and create a path between Drayton and Marcham that attracts use. The PRoW will also link with the old and proposed WB canal path therefore mitigation should consider this potential benefit or negative impact if not addressed.	Socio-Economic
CPC5	Maximise potential opportunity for recreational benefits	GIS analysis of PRoW, open spaces, cycle routes, canals, other forms of regional/nationally important receptors (eg National Cycle Routes), and community assets.	A	Option allows some additional recreational benefits to be realised	Construction and operation of the A415 to SESRO Road B may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to not only mitigate this impact but to enhance the crossing and create a path between Drayton and Marcham that attracts use. The PRoW will also link with the old and proposed WB canal path therefore mitigation should consider this potential benefit or negative impact if not addressed.	Socio-Economic
CPC6	Support the realisation of socio-economic incentives on SESRO, including employment, skills, tourism, sustainable travel, connecting people with nature and environmental education	GIS analysis of footprint, community assets, private residents, and businesses. Also awareness of overall project objectives is needed to conclude if the designs align with these.	A	Site supports some of the social-economic incentives of the overall scheme	Construction of the new road may affect operation/attendance of key socio-economic assets (schools in Marcham, Abingdon and Drayton). Abingdon hospital lies east of the new road and potential disruption of this road may affect access to medical facilities. Construction of the new road facilitates wider socio-economic goals of the project (employment, education etc.) but has some potential to create temporary disruption on roads and permanent disruption on PRoW if not mitigated correctly.	Socio-Economic
CPC7	Minimise overall SESRO Order Limits extent and land acquisition, without compromising SESRO needs and project benefits	Spatial comparison of land that would likely be included in the DCO Order Limits, including construction working areas, access and highways or PRoW interactions.	G	Requires minimum Order Limits extent	Partially lies within the SESRO safeguarded area in the VoWHDC Local Plan. Potential to use the roundabout to serve both SESRO and Dalton Barracks housing development.	Consenting
CPC8	Aim for consistency with published and (insofar as possible) emerging Local Plan land use allocations	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in existing and any emerging Local Plan documents and any Supplementary Planning Documents.	G	Low or no impact	Partially lies within the SESRO safeguarded area in policies CP14 and CP14a of the VoWHDC Local Plan. Also lies within an area safeguarded for flood risk management under policy CP14, but again it offers the opportunity for one embankment to provide both access to the SESRO site and flood storage. A small portion of the northern part of the road (including the roundabout) lies within land safeguarded for strategic highway improvements within the Abingdon-on-Thames and Oxford Fringe Sub-area (CP12). The specific allocation is for South Abingdon-on-Thames Bypass linking the A415 to the West and South East of the town, including a new River Thames crossing. It is possible that the roundabout could benefit the South Abingdon-on-Thames Bypass and provide the western section. This is also applicable to the proposed revised safeguarded area for the bypass (now referred to as the South Abingdon Movement Corridor) under Policy ID3 in the consultation draft Joint Local Plan 2041. The road avoids the Westend Allotments. Also within the area safeguarded for flood risk management (Policy IN7) in the consultation draft Joint Local Plan 2041. No land use allocation conflicts with the Oxfordshire County Council Minerals and Waste Local Plans. Not within the area of the South Oxfordshire District Council Local Plan.	Consenting

CPC9	Aim for consistency with any adopted Neighbourhood Plan policy applicable to the land area affected	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in any made Neighbourhood Plan.	G	Low or no impact	The road lies within both the made Drayton Neighbourhood Plan (adopted July 2015) and the made Wootton and St Helen Without Neighbourhood Plan (adopted December 2019). The Drayton NP outlines traffic as a problem in the Parish; when there are incidents on the A34, the B4017 that goes through the middle of Drayton is used as a relief road. Providing an alternative route to the A34 will help relieve this pressure. The Wootton and St Helen Without NP also recognises traffic to be a challenge and that transport infrastructure is considered to be inadequate. Traffic is also impacting the character of the Parish. However, as the road only enters the southern-most part of the designated Parish area, it is unlikely to have an impact (positive or negative) on traffic.	Consenting
CPC10	Avoid development of infrastructure within specifically designated areas or their setting, as applicable (e.g. Green Belt, AONB, Common Land, Open Space)	Spatial comparison with designated sites, their settings, and the nature of development works expected.	G	Does not require development of above-ground infrastructure within these designations or development likely to have more than a negligible effect on the setting (where applicable)	Not located within a specifically designated area, such as Green Belt, AONB, Common Land or Open Space.	Consenting
CPC11	Avoid encroachment on any safeguarded land in minerals and waste policy, unless the minerals can be beneficially utilised as a result	Spatial comparison of allocated sites and review of policy wording in existing and any emerging Waste and Minerals Local Plan documents.	G	Low or no impact	Not located in minerals safeguarding area or on a site allocated for minerals or waste uses.	Consenting
CPC12	Ability to integrate with existing nationally-significant infrastructure, statutory undertakers' major infrastructure, or any proposed future Nationally Significant Infrastructure Projects (NSIP) (such as that of National Highways, Environment Agency, Network Rail)	Review of NSIP projects on PINS's register; review of Network Rail and National Highways investment plans; spatial review of statutory undertakers' assets.	G	Low or no interaction with existing infrastructure or proposed Nationally Significant Infrastructure Project (NSIP)	No NSIPS currently registered. No known proposals from Network Rail or National Highways. The National Highways RIS3 Investment Plan will be published in 2024 which will detail the A34 improvement project. Compatible with Abingdon-on-Thames Bypass (although this would not be a NSIP if it were to go ahead) and the revised safeguarded area under Policy ID3 in the draft Joint Local Plan 2041. Potential to facilitate or be compatible with the Abingdon Flood Alleviation Scheme under consideration by the Environment Agency and as safeguarded under VoWH Local Plan policy CP14, although not as effectively as Road A. Existing gas line is adjacent to road B, but does not cross it. A high-voltage mains line does cross road B, as does an electric line and water line.	Consenting
CPC13	Minimise the consenting complexity due to the need for additional consents and licenses that may be required outside the Development Consent Order (DCO), e.g. additional Flood Risk Activity Permit, Environmental Permit, abstraction/discharge Licence, European protected species licence, etc	Review of the nature of expected development works against the list of other consents and licenses developed at Gateway 2.	A	One or more additional consent/license required	Roads A, B, C and D cross over multiple PRoW and so a Temporary Traffic Regulation Order may be required, although this can potentially be included within the DCO application. A section 278 highways agreement, street works notice and highway works permit will also likely be necessary, although could also be included within the DCO. The location of Roads A, B, C and D within areas of Flood Zone and Abingdon Flood Alleviation Scheme may also require a Standard or Bespoke Flood Risk Activity Permit or a Flood Risk Activity Exemption permit from the Environment Agency, but these will be required anyway for other reservoir works. Likelihood of at least one European protected species relocation licence required.	Consenting
CPC14	Avoid or minimise the need for any consequential development consenting (i.e. displacement or alteration of other development)	Review of existing development within the likely land-take, its nature and scale.	G	No existing development requires planning permission to relocate or alter	Existing high-voltage, electric lines and water line will need to be diverted as pass through Road B. However, this can form part of the DCO associated development or potentially be delivered through statutory undertaker permitted development.	Consenting
CPC15	Minimise interfaces/reliance on external governing/third parties (e.g. Removing the canal removes a stakeholder, reducing interfaces and permissions required from Network Rail, National Highways, National Grid)	Review GIS layers for services against the options. Expert Judgement.	A	Several manageable interfaces with others	All options score similarly because each would have interactions. Option B has an interface with Dalton Barracks proposed access road and potentially South Abingdon Bypass.	Consenting
CPC17	The option provides economic benefits by directing traffic through local town centres which will boost their footfall and potential for people to stop and utilise their local economy	Expert judgement	G	The routes for this option do not provide a bypass of local towns and villages. Therefore, this option may boost the local economy of these towns and villages as people may be more likely to stop and visit the local businesses here.	Access road to site only.	Transport Planning
CPC18	Influence the location and layout of development to maximise the use and value of existing and planned sustainable transport investment	Expert judgement	A	Option partially supports existing and planned public transport infrastructure between key destinations	Access road is longer route to accommodate the flood defence scheme. Making the journey by road longer for bus travel and ped/cyclist using shared footway along the road route. Junction to access the road favours walking and cycling from Abingdon over Marcham.	Transport Planning
CPC19	Maximise the benefits of travel for non-motorised users between key destinations	Expert judgement	A	Provides some routes that would encourage some users to walk, cycle or use bridleways but could be improved further to prioritise a modal shift away from trips undertaken by private vehicles	Access road to site only. Shared use footways beside the road may encourage users to use non-motorised transport to get to the reservoir or other recreational facilities.	Transport Planning
Property & Land Acquisition						
PRP1	Minimise loss of sensitive properties, i.e. residential, commercial, green belt, common land, historical or community assets due to project delivery	Review Land allocation mapping on ArcGIS.	G	No permanent or temporary loss of sensitive properties	Land is all agricultural.	Property & Land Acquisition
PRP2	Minimise loss of land allocated within the Local Plan for alternative higher value / social / cultural value uses, e.g, residential, historical or community assets due project delivery	Review Land allocation mapping on ArcGIS.	G	No permanent or temporary loss of allocated land for higher value or social value properties	Road option B, does not immediately impact but is within close proximity to land with residential planning permission (see pic). Other options are fine.	Property & Land Acquisition

PRP3	Minimise permanent loss of best and most versatile agricultural land (grades 1, 2 and 3)	Review of agricultural grading layer on ArcGIS, based on 2019 Provisional Agricultural Land Classification	A	Results in loss of any Grade 2 agricultural land or >50% Grade 3 agricultural land	Agricultural land approximate percentage: grade 2 = 3% grade 3 = 80% grade 4 = 17% Due to the presence of Grade 2 ALC, the RAG score is Amber.	Property & Land Acquisition
PRP4	Assessment of Land and Property asset costs and associated compensation due under the Compensation Code	Review of land use / designation on ArcGIS	G	Land acquisition costs likely to be relatively low.	Agricultural land values can range from £8,000 - 14,000 in the area. Landowners may be eligible for Severance claims depending on design and farm practices.	Property & Land Acquisition
PRP5	Assessment of Special Category Landowners (SCLs), utility infrastructure, national asset protection agencies and Crown bodies	Review of affected landowners	G	No SCL on identified option	Sensitive Landowners only: Abingdon town council and Earl of Plymouth estates.	Property & Land Acquisition
PRP6	Minimise disruptions of landowners access to their land required for temporary works	Review location in conjunction with existing road network	G	Landowners able to access their land during construction and operation phases	Landowners able to access their land during construction and operation phases.	Property & Land Acquisition

Appendix C SESRO Access Road Option C Criteria Workbook

A415 to SESRO Road C

Criteria code	Criteria Description	Method of Assessment	RAG	Description of RAG	Narrative	Sub-Theme
Constructability						
CON1	Safety - Risk of endangering construction workers or members of the public during construction e.g. water, ground, height, rail, road and utilities	Look at programme and list types of construction involved. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	A	Works can be constructed safely but enhanced control measures required	Option C requires 11 crossings and requires 1.7km of 132kV HV Overhead diversions and a gas diversion over the ADC. These would increase the risk of endangering workers and require enhanced measures, and is therefore rated amber.	Health and Safety
CON2A	Programme - Duration, longest /shortest, but also consider whether the longer duration has an impact on the overall scheme programme	Compare differences in the programmes which would materialise from different options. Consider earthworks seasons.	R	Likely to impact the critical path of the Gate 2 SESRO programme and therefore the estimated overall duration of the SESRO construction works.	Option C has a length of 2.8km and an estimated 110,000m3 of fill. Option C has an alignment which is away from the A34, which removes the opportunity for the bridge across the ADC to also be used for the gas diversion and (potentially) to help facilitate the temporary diversion of the A34 to allow the construction of the ADC box culvert. For Option C a separate arrangement would be required for the ADC crossing and therefore, likely a long construction programme duration.	Programme
CON2B	Programme - Opportunities for construction programme acceleration through efficiencies	Compare differences in the programmes which would materialise from different options.	A	The option has limited potential to introduce programme efficiencies and reduce the construction programme	If construction access can be temporarily provided from the A34 layby then construction traffic can be allowed from both ends of the road. In addition to this, for Option C, the alignment provides an opportunity to reduce the construction programme if the Marcham Bypass has been constructed in advance of the SESRO project (however, this is considered to be unlikely).	Programme
CON2C	Programme - Dependencies i.e. proximity or physical relationships between elements of scope that introduce programme dependencies	Is the options on the critical path? Will it impact other critical activities?	A	Several major dependencies/ multiple minor dependencies	The A415 to SESRO Access Road, and other haul roads need to be constructed prior to construction of the rail sidings. This option, therefore, has multiple minor dependencies and scores amber.	Programme
CON2D	Programme - Risk	Are there items in the construction which have a significant programme risk	A	Moderate programme risk	Option C has some utility diversion requirements, and is in a flood zone. It is therefore considered to have moderate programme risk and is rated amber. Option C has 11 crossings, which may indicate a programme risk.	Programme
CON3A	Logistics - Space available for construction and materials storage	Determine space constraints using GIS and options layouts from option definition.	A	Limited / restricted space	Option C is far away from the A34 and close to existing roads. This is thought to make identification of areas for construction of Replacement Floodplain Storage more challenging (RFS will be needed to account for the road embankment which is located within the current floodplain).	Logistics
CON3B	Logistics - Suitable and efficient access for construction workers, deliveries and waste removal including minimisation of lengths of new roads for access during construction	Determine method of access using GIS and options layouts from option definition.	G	Adequate access is available, and only short length (relative) of road is required for construction	A415 to SESRO Access Road itself is providing access for construction workers and deliveries.	Logistics
CON3C	Logistics - Import of materials or resources during construction	Use quantity estimates to assess different options.	A	Moderate amount of import materials required	The A415 to SESRO Access Road requires the import of materials for the road surface. The earthworks required for the road embankment are assumed to be sourced from the site. This option is assessed as amber because access to construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.	Logistics
CON3E	Logistics - Vehicle movements	Use vehicle movement estimates to assess different options.	A	Construction likely to add vehicle movements.	The number of vehicle movements will be related to the length and earthworks required. This option is assessed as amber because access to the construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.	Logistics
CON4A	Construction Complexity - Temporary conditions/works requirements e.g. embankment slope stability and moisture outside of placement seasons.	Expert Judgement	G	Temporary Works requirements minimal and can be used in the permanent state and no extension to the programme	This option is assessed as green because the temporary state can be easily adopted to a permanent state i.e. an initial subbase may be laid on top of an embankment and then later used as part of the permanent state. Option C has 11 crossings, 3 of which are likely need to a bridge.	Construction complexity
CON4B	Construction Complexity - Location conflict/opportunity with another engineering component of the scheme or other SRO/non-SRO schemes, e.g. Severn to Thames Transfer (STT), Thames to Southern Transfer (T2ST), TW Swindon and Oxfordshire supply zone transfer, Transfer to Farmoor Reservoir	Expert judgement and knowledge of surrounding schemes	A	Location / layout of the option neither clashes nor provides an opportunity to be developed with another component of this scheme (or another scheme)	Potential for conflict with / interaction with the proposed Southern Marcham Bypass Scheme. At this stage, this can be viewed as a conflict or an opportunity. In addition to this, Option C has two crossings associated with the Auxiliary Drawdown Channel, and would require separate arrangements for the gas diversion crossing over the ADC. Option C has the potential to conflict with an Abingdon Flood Alleviation Scheme due to its alignment.	Construction complexity
CON4C	Construction Complexity - Minimise the number and complexity of additional structures/assets required or modifications to the existing structures/assets in order to facilitate the option, e.g. bridges, culverts, crossings	Determine using GIS and options layouts from option definition.	A	Option requires a moderately complex (mitigation likely) and/or moderate number of additional structures and/or modification to existing structures.	Option C scores amber as it requires a moderate number of new structures (11 crossings)	Construction complexity
CON5A	3rd Party Impact - Potential to disrupt existing road network during enabling works and construction	Expert judgement	A	Disruption likely to be moderate	This option is assessed to have a moderate impact on traffic because construction material will be delivered to site by road; however, the rate of deliveries is expected to be on average below 20 HGVs per day, assuming reservoir materials are brought in via train.	3rd Party Impact
CON7A	Ground - Terrain of site, and implications for the need for earthworks and engineered slopes	Use of lidar and civil 3D models to assess amount/location of earthworks required	A	Terrain is unfavourable to the design of assets and therefore increases the amount of earthworks required	Option C crosses the relatively flat River Ock floodplain. Option C is not aligned close to the A34 and therefore would not rise up over the hill. This requires an estimated 110,000m3 of fill material.	Construction complexity
CON7B	Ground - Risk of unexpected conditions	Use of expert judgement based on comparable areas	A	Moderate exposure to risk of unexpected ground conditions.	The road option passes through the undeveloped floodplain of the River Ock, so there is a moderate risk for unexpected ground conditions. There is a possibility of high water table from the River Ock.	Construction complexity

CON7C	Ground - Impact of ground conditions on the complexity of design and construction	Use of expert judgement	G	Ground conditions are unlikely to increase the complexity of design and construction with likely only a minimal (if any) impact on cost or requirement for materials that are difficult to source	The road option passes through the undeveloped floodplain of the River Ock, so there is a moderate risk for unexpected ground conditions. Ground conditions are unlikely to increase the complexity of design.	Construction complexity
Operability						
OPS1A	Safety - Risk of endangering operational staff, visitors or members of the public during operation	Look at operational activities and public access. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	G	Works can be operated safely without enhanced control measures	The road design follows best practice such as the Design Manual for Roads and Bridges regarding elements such as the speed limit, bend radii, gradients and drainage.	Health and Safety
OPS1B	Safety - Access and egress for operational staff, visitors, deliveries and waste removal during normal operations and emergencies	Tunnel silt issue to be considered by expert judgement	G	Access/egress can be provided	The road design follows best practice such as the Design Manual for Roads and Bridges, allowing for sufficient access/egress in emergencies.	Health and Safety
OPS2A	Maintenance - Ease of maintenance	Expert judgement	G	Majority of maintenance activities could be undertaken during limited closure periods and / or with limited disruption	This road option will be accessible for maintenance. It is anticipated that it could be closed for maintenance during times of low traffic movement (i.e. at nights and/or weekdays), or be undertaken so that a single lane is kept open to minimise disruption.	Operational Complexity
OPS4A	Reliability - Footprint of the option within flood zones (as an indication of the potential for damage and the challenge of operation / maintenance during flood events)	Review GIS supported by expert judgement	A	Option is within the flood zone, however damage is not considered to be a significant risk	Option is within the flood zone, however damage is not considered to be a significant risk as option will be designed (i.e. elevation, drainage) to withstand predicted flooding without damage.	Operational Resilience
OPS4B	Reliability - The option does not have a single point of failure but rather includes backup infrastructure so that it can remain in operation if the primary infrastructure is unavailable, e.g. siphons in addition to tunnel for emergency discharge or alternative road route to reservoir crest	Expert judgement	A	There is a single point of failure but mitigation measures can be introduced to allow for continued operation, which might be a delayed or reduced service	In a scenario where the A415 to SESRO Access Road is out of operation it is assumed that access would be provided for operational vehicles via retained haul roads and the proposed local car park at the end of the Hanney Road "stub" outside of Steventon.	Operational Resilience
OPS5A	Adaptability - Space available for future expansion of social / recreation infrastructure	Expert judgement	G	Opportunity / adequate space for envisaged expansion	No expansion envisaged; however no constraint identified to future expansion, albeit impact on the floodplain would need to be assessed during design.	Operational Resilience
OPS5B	Adaptability - Flexibility for future modifications e.g. increasing reservoir storage volume, rail station at wantage and grove, construction of Marcham Bypass	Expert judgement	A	Option includes a limited degree of flexibility for future modifications	Option C alignment offers the opportunity for dual function (South Marcham Bypass). However, Option C does not facilitate the potential Abingdon Flood Alleviation Scheme.	Operational Resilience
OPS8A	3rd Party Impact - Potential to disrupt existing road network during operation	Expert judgement	A	Disruption likely to be limited	The Option C junction location was tested with indicative traffic flows, which indicated they can be managed appropriately. Junction location is set away from the A34, which decreases the risk of impact on the A34, but is close to Marcham which increases the risk of potential traffic impacts in the village. The junction coincides with the proposed South	Transport Planning
OPS8C	3rd Party Impact - Option facilitates infrastructure for other modes of transport, including pedestrians, cyclists and other non-motorised users	Expert judgement. Review GIS for PRoW, cycle routes, etc.	G	Option provides segregated cycle facilities, a footway that is wider than 2m, and suitable crossing infrastructure is provided for pedestrians and cyclists. Additional Bridleways or improvements or maintenance provided to existing bridleway routes are also included	PRoWs can be linked across the site creating new routes to surrounding area. The options are considered to score similarly against this criteria.	Transport Planning
OPS8D	3rd Party Impact - Congestion at the relevant junctions for all movements, and the effective use of the transport network through innovative solutions	Expert judgement	A	Option provides a partial solution to delivering roads that will be effectively able to deal with traffic upon completion. However, the junctions designed may be unable to cope with traffic flows in future years.	Initial modelling illustrates the spare capacity at highway junctions reduces over time, however, this is can be managed.	Transport Planning
OPS8E	3rd Party Impact - Impact on journey time reliability	Expert judgement	A	Option is not expected to either increases or improve journey times for road users on the road network	Initial modelling illustrates capacity at highway junctions reduces over time, however, this is can be managed.	Transport Planning
Relative Costs						
COS1	Capex cost of the option	Cost estimate calculation for each option.	G	CAPEX estimated to result in an increase of <1% of the CAPEX for the overall SESRO project compared to the lowest cost option	Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 0.4% of the total SESRO costs. Option C results in a total project cost of 0.4% more than the lowest cost option.	Cost
COS3	Opportunity for cost-sharing with other SROs, NSIPs and local non-SRO schemes/plans, e.g. STT, T2ST, SWOX/Farmoor, Abingdon flood storage	Cost estimate calculation for each option.	A	Limitied opportunities identified for cost saving.	Option C provides an opportunity for cost-sharing with the South Marcham Bypass Scheme - but not the Abingdon Flood Alleviation Scheme.	Cost
Carbon Costs						
CAR1	Carbon costs associated to the Capex of the option	Carbon estimate calculation for each option.	G	Emissions (tCO2e) estimated to result in an increase of <1% of the emissions (tCO2e) for the overall SESRO project compared to the lowest emissions (tCO2e) option	Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option C results in a total project carbon of 0.2% more than the lowest carbon option.	Carbon
CAR3	Opportunity for mitigation e.g. smaller earthworks may lead to less carbon	Carbon estimate calculation for each option.	A	Limited likelihood and magnitude of mitigation opportunity.	Option C is a relatively longer route and requires more fill for its embankments as well as additional watercourse crossings (requiring bridges or culverts).	Carbon
Environmental Performance						
ENV1A	Minimise impacts on Special Area of Conservation (SAC)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SAC's or potential SAC's within the boundary of the proposed A415 option C road. The closest SAC to the road is Cothill Fen SAC located approximately 2.8Km to the north.	Biodiversity and Nature Conservation

ENV1B	Minimise impacts on Special Protection Area (SPA)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SPA's or potential SPA's within the boundary of the proposed A415 option C Site. The closest SPA to the proposed road is Thames Basin Heaths SPA located approximately 43Km to the south-east.	Biodiversity and Nature Conservation
ENV1C	Minimise impacts on Ramsar	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no Ramsar sites or potential Ramsar sites within the boundary of the proposed A415 Option C. The closest Ramsar site to the Road is South-west London Waterbodies located 58Km to the south-east.	Biodiversity and Nature Conservation
ENV1D	Minimise impacts on Site of Special Scientific Interest	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	Road is located within the Impact Risk Zone for Barrow Farm Fen SSSI. However, impacts are considered unlikely due to the distance the works are located away from the SSSI.	Biodiversity and Nature Conservation
ENV1E	Minimise impacts on National Nature Reserve	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no NNR within the boundary of the proposed A415 option C site. The closest NNR is located 2.7Km to the north. Cothill NNR.	Biodiversity and Nature Conservation
ENV1F	Minimise impacts on Local Nature Reserve (LMN)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no LNR within the boundary of the proposed A415 Option C. The closest LNR to the Road is located 4.7Km to the east of the site. The site is called Abbey Fishponds LNR.	Biodiversity and Nature Conservation
ENV2A	Minimise impacts on Ancient Woodland	Natural England Ancient Woodland Maps and Professional Judgement.	G	No ancient woodland impacted	Historic mapping indicates that there is no ancient woodland present on-site	Biodiversity and Nature Conservation
ENV2B	Minimise impacts on Ancient and Veteran Trees	Woodland Trust Ancient Tree Inventory map search and professional judgement	A	Development in close proximity with potential indirect impact to ancient or veteran trees	There are no ancient or veteran trees recorded by the Woodland Trusts Ancient Tree Inventory on or close to this option. However, survey may identify trees that could be classified as ancient or veteran. As such, this option scores amber on a precautionary basis pending survey.	Biodiversity and Nature Conservation
ENV2C	Minimise impacts on Protected Trees	Check against published TPO dataset.	G	No protected trees impacted	No protected trees would be impacted.	Landscape & Visual
ENV2D	Minimise impacts on vegetation (including trees, woodland, hedges and shrubs)	Check against baseline resources and based upon high level knowledge of site from previous site visits. Professional judgement.	G	No direct impact on vegetation which is of high arboricultural/amenity value (A or B grade) or biodiversity habitat in good condition. OR Limited direct impact on vegetation which is of lower arboricultural/visual amenity value (e.g. C grade) or biodiversity habitat in poor condition.	Construction of the road will require the removal of vegetation belts at several field boundaries. It is assumed that few if any A or B grade trees are likely to be impacted.	Biodiversity and Nature Conservation and Landscape
ENV3	Minimise impacts on Local Wildlife Sites (LWS)	Professional Judgement and LWS Citation provided by TVERC.	G	No impacts to LWS	There are no LWS located within or adjacent to the boundary of the A415 Option C. The closest LWS to the road is located approximately 300m to the north-west (Marcham Salt Spring).	Biodiversity and Nature Conservation
ENV4A	Minimise impacts on Scheduled monuments or activities which could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest scheduled monument to the option alignment is the settlement site north of Cow Lane which lies 700m to the north	Historic Environment
ENV4B	Minimise impacts on listed buildings or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	There are a series of listed buildings within the village of Marcham near the option alignment with the nearest being Grade II* listed Hyde Farmhouse 160m to the north-west.	Historic Environment
ENV4C	Minimise impacts on Registered Parks and Garden or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The Albert Park RP&G lies just over 2.5km to the east of this option alignment at its closest point.	Historic Environment
ENV4D	Minimise impacts on Registered Battlefields or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The 1643 Battle of Chalgrove Registered Battlefield lies over 15km to the east of the option alignment.	Historic Environment
ENV4E	Avoid impacts on World Heritage Sites or activities that could lead to a loss of significance, including setting	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	Blenheim Palace WHS lies over 18km north of the option alignment.	Historic Environment
ENV4F	Minimise impacts on conservation areas which could result in loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	Marcham conservation area is the closest to the option alignment at just under 500m north-west.	Historic Environment

ENV5A	Minimise loss to non-designated built heritage	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Extensive loss of non-designated built heritage of low value within the permanent infrastructure zone and adverse changes to within a 500m area from the edges of the permanent infrastructure OR more limited effects on non-designated built heritage of medium value	There are no known non-designated historic buildings along the line of the option or adjacent to it, according to the Oxfordshire Historic Environment Record.	Historic Environment
ENV5B	Minimise loss to paleoenvironmental remains	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	A	Extensive scale of loss or damage to medium value remains within the construction area and adverse changes to similar buried remains in a 1km area around the permanent infrastructure from temporary and permanent changes to local hydrogeological regimes OR more limited effects on remains of high value	The route option crosses the River Ock and paleoenvironmental remains are likely to be present but their extent and significance are unknown.	Historic Environment
ENV5C	Minimise loss to non-designated historic landscapes	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or extensive changes to low value non-designated historic landscapes within the construction area and extensive changes to the setting of the same resource outside the permanent infrastructure OR more limited effects on non-designated historic landscapes of medium value	There are no known non-designated historic landscapes along the option alignment according to the Oxfordshire Historic Environment Record.	Historic Environment
ENV5D	Minimise loss of non-designated archaeological remains	Professional judgement, incorporating the use of the IEMA's Principles of Cultural Heritage Assessment in the UK and the Chartered Institute for Archaeologists standard and guidance document for desk based assessment	A	Permanent infrastructure and construction area will result in the loss and / permanent damage to non-designated buried and extant archaeological remains worthy of regional significance which can only be partially mitigated through preservation by record	The route option passes through an undated cropmark field system and settlement complex (HER 12145) which is assumed a regional heritage value given similar examples in the vicinity and a worst case scenario	Historic Environment
ENV6A	Minimise loss of fluvial flood storage within Flood Zone 2 or 3	Measure using GIS	A	Site is within flood zone 2 and 3 but loss of storage is minor or mitigation is available	Option is not considered to have a significant impact on fluvial flood risk, 2340m length of road is sited within flood zones but sufficient space has been provided for Replacement Floodplain Storage along the watercourse diversions.	Flood Risk
ENV6B	Minimise impacts of pluvial flood risk.	Expert judgement	G	No predicted impacts on pluvial flood risk	Option is not considered to have a significant impact on pluvial flood risk as it is a single carriageway. The options are considered to score similarly against this criteria.	Flood Risk
ENV6C	Minimise impacts of groundwater flood risk.	Checking existing national and local records	G	No predicted impacts on groundwater flood risk	Option is not considered to have a significant impact on groundwater flood risk. The options are considered to score similarly against this criteria.	Flood Risk
ENV7A	Minimise disturbance of potentially contaminated land	Checking existing national and local records	G	Minimal or no disturbance of contaminated land unlikely to cause cost or program implications or harm to potential receptors. No remediation required	There are unlikely to be contamination sources within 250m of this option other than the Marcham Road and the infilled canal which cross the site. This layout is partially outside of the boundary used in the Gate 2 EAR. IS THIS A PROBLEM - DO WE NEED MORE DATA?	Land
ENV7B	Minimise disturbance of potentially contaminated land specifically in relation to authorised and historic landfills	Checking existing national and local records	G	Not within authorised and historic landfills or previous industrial sites or within 250m of authorised and historic landfills or previous industrial sites	There is no authorised or historical landfill within 250m of this option	Land
ENV8	Minimise disturbance of land with known potential for Unexploded Ordnance (UXO)	Checking existing national and local records	A	Disturbance of a low quantity of UXO which can be easily managed / remediated. Unlikely to have significant cost or program implications	A pre-desk study assessment from Zetica acquired for gate 2 identified various potential UXO risks across the SESRO area, therefore, recommend a detailed UXO survey of the area. Specifically an early 20th century rifle range was in use in the area of this option.	Land
ENV9A	Minimise loss of terrestrial priority habitats (use narrative to describe type and quantum)	Use of aerial imagery, MAGIC maps and Professional Judgement	A	Priority habitat directly impacted but mitigation feasible	Construction of the road will require the removal of Floodplain Grazing Marsh and Hedgerows which are all listed as Priority habitats. The River Ock will also be crossed which is also a Priority habitat.	Biodiversity and Nature Conservation
ENV9B	Minimise loss of aquatic priority habitats (use narrative to describe type and quantum)	Professional judgement based on knowledge of Water Framework Directive.	A	Priority habitat directly impacted but mitigation feasible	Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the any WFD waterbody to reduce potential impacts.	Aquatic Environment
ENV10A	Reduce effects on North Wessex Downs Area of Outstanding Natural Beauty (AONB) and its setting	Professional judgement.	A	AONB and its setting likely to be affected. Effect is unlikely to be significant.	The introduction of traffic, highway infrastructure and limited lighting into the rural and generally undeveloped landscape would interrupt the small to large-scale field pattern divided by hedgerows and tree/woodland belts along watercourses which would erode a key characteristic which contributes positively to the local landscape character and setting of the North Wessex Downs AONB. Effect on landscape character and tranquillity of AONB could be mitigated to avoid a significant effect, particularly given the distance involved and the presence of existing highway infrastructure within the setting.	Landscape & Visual
ENV10B	Reduce effects on local landscape character	Professional judgement.	R	Effect on local landscape character is likely to be significant.	The introduction of traffic, highway infrastructure and limited lighting into the rural and generally undeveloped landscape would erode the levels of tranquillity and interrupt the small to large-scale field pattern divided by hedgerows and tree/woodland belts along watercourses. This would erode a key characteristic which contributes positively to the local landscape character and introduce components which are not characteristic. Effects are likely to be significant locally even with established mitigation in place.	Landscape & Visual
ENV11A	Reduce effects on panoramic views from national trail, open access land and important viewpoints in AONB	Professional judgement.	G	Panoramic views from national trail, open access land and important viewpoints in AONB unlikely to be affected or the proposal is likely to be barely discernible in views.	Given the distance, traffic and highway infrastructure on the new road is likely to be barely discernible in panoramic views from The Ridgeway National Trail once mitigation has established.	Landscape & Visual

ENV11B	Reduce effects on sensitive local visual receptors	Professional judgement.	R	Effect on local views of sensitive visual receptors likely to be significant.	Traffic and highway infrastructure is likely to be visible in local views from some PRoWs, an isolated residential property and other residential properties on the eastern edge of Marcham. There would also be some filtered views through existing vegetation from the western edge of Drayton, seen in the context of existing pylons, overhead lines and traffic on the A34. Effects on most views could be reduced in the long term, but some significant effects may remain. (Effect on resident's views most noticeable with this option.)	Landscape & Visual
ENV12	Minimise disturbance/encroachment into Air Quality Management Area (AQMA)	Based on an understanding of the scale and nature of activities, air quality management areas (AQMAs) were identified in close proximity to the proposed works.	A	Within 1km of an AQMA OR some construction traffic must go through an AQMA	Marcham AQMA is less than 130 m W of the Road C access point. Although the anticipated construction and operational activities would likely lead to a negligible change in air quality (assuming construction traffic and the majority of tourists travel E along the A415), its proximity to the AQMA means its assigned an amber score.	Air Quality
ENV13	Minimise disturbance/encroachment into Groundwater Source Protection Zone (SPZ)	Magic maps	G	Site is within Zone 3 or not within a SPZ	Site is not within an SPZ.	Aquatic Environment
ENV14A	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Cow Common Brook and Portobello Ditch' WFD waterbody (GB106039023360) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration -** Crossing on Cow Common Brook is over the proposed watercourse mitigation area. This would need to be re-evaluated and potentially alternative mitigation found should this option be taken forward. Any other impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14B	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ock and tributaries (Land Brook confluence to Thames)' WFD waterbody (GB106039023430) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - Crossing on River Ock is nearer to A34 crossing, on a straight section, reducing the area of impact. Any impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14C	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Thames (Evenlode to Thame)' WFD waterbody (GB106039030334) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration -** This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14D	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Sandford Brook (source to Ock)' WFD waterbody (GB106039023410) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration -** This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14E	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Childrey Brook and Norbrook at Common' WFD waterbody (GB106039023380) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration -** This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14F	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ginge Brook and Mill Brook' WFD waterbody (GB106039023660) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration -** This waterbody is not directly impacted by the proposed road.	Aquatic Environment

ENV14G	Option does not affect Water Framework Directive (WFD) Quality Elements within one of WFD waterbodies downstream of the River Thame to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives. These WFD waterbodies include: - Thames Wallingford to Caversham - WFD waterbody GB106039030331 - Thames (Reading to Cookham) - WFD waterbody GB106039023233 - Thames (Cookham to Egham) - WFD waterbody GB106039023231 - Thames (Egham to Teddington) - WFD waterbody GB106039023232	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV15A	Maximise potential for future environmental benefits (terrestrial), e.g. increase tree planting	Professional Judgement	G	Site allows substantial additional environmental benefits to be realised	Being a predominantly arable landscape there is plenty of opportunity for environmental enhancement through the planting of trees and creation of habitats with high distinctiveness. Also opportunity for the creation of wetland areas including wet woodland and ponds.	Biodiversity and nature conservation
ENV15B	Maximise potential for future environmental benefits (aquatic), e.g. increase wetlands area	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Site allows substantial additional environmental benefits to be realised	Connectivity through the watercourse and associated wetlands is crucial. Thus any road crossings will need to consider this appropriately and mitigation provided.	Aquatic Environment
ENV16	Maximise flexibility in routing diverted watercourses so their habitats can be of sufficiently high quality to contribute to catchment Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Site allows some flexibility in routing watercourses / Good quality habitat options are available	Road route is very close to the proposed course of the Eastern Watercourse Diversion (EWD) around the proposed visitor centre, which means that the EWD design needs to be reviewed in this area to ensure there is sufficient space. Road crossings need to ensure sufficient light and connectivity through the structure. Preference is a clear span, bridge on all crossings of principal WFD waterbodies (blue line) but an appropriately sized box culvert is acceptable on other watercourses in the WFD catchment. Pipe crossings will be deemed to be unacceptable and should be avoided.	Aquatic Environment
ENV17	Minimise disturbance/encroachment into Local Geological Sites (LGS)	Checking existing national and local records	G	Site is located more than 250m from LGS	No LGS present	Biodiversity and nature conservation
ENV18A	Minimise impacts associated with Noise and Vibration as a consequence of the construction of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment. Red band distance is from works site/road to the SOAEL+5dB, and Amber distance is from SOAEL+5dB to the SOAEL. Road Construction: Red 60m, Amber 61-99m, Green 100m. Construction Traffic: Red 40m, Amber 41-184m, Green 185m. Road Const. (bridge construction): Red 75m, Amber 81-124m, Green 125m. (NOTE: No sensitive properties have been identified within 125m of potential piling works at road bridges and significant effects are not anticipated. Distances referenced in the assessment are those measured between the proposed roads and receptors). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis (with >700 extra receptors included, namely at Diversion Road C, which is outside of Gate 2 Study Area).	A	Potential for significant effects but likely to be mitigated if they occur	The closest noise sensitive property is located approximately 100m from Access Road A415-SESRO Option C with the next three closest properties between ~120 and 140m from the option. Based on the indicative assessment, a total of 17 properties exist within 184m of Access Road A415-SESRO Option Care, and are predicted to be within the Amber band during construction.	Noise
ENV18B	Minimise impacts associated with Noise and Vibration as a consequence of the operation of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment (inc. bunding around sidings). Red band is from works site to the SOAEL+5dB distance, and Amber is from SOAEL+5dB distance to the SOAEL. Rail Sidings: Red 675m, Amber 676-1209m, Green 1210m. This is based on worst-case activity, Material Handling, which includes potential for works between 06:00 to 07:00 and was assessed using night-time noise assessment criteria at Gate 2 as a precautionary approach. The noise emission for the activity is based on G2 assumptions, with update made following review by Costain (JB 05Jun). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis.	A	Potential significant effects but likely to be mitigated if they occur	The closest noise sensitive property is located approximately 100m from Access Road A415-SESRO Option C, with the next three closest properties between ~120 and 140m from the option. Based on these measured distances, a single property is predicted to be within the Amber band due to operational traffic movements.	Noise

ENV19A	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the construction of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	A	Based on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), there is the potential for a significant effect, but can be appropriately mitigated. Residual significant effects are avoided or are not likely.	There are between 10 - 100 high sensitivity receptors (i.e. dwellings) within 350 m of the road C route with the nearest being approximately 100 m WNW of the proposed route (at Willow Farm). Activities include the construction of a two lane carriageway (approximately 4.4 km in length) and 11 crossings. The route may eventually form part of the South Marcham Bypass. The Road C route is approximately 130m from Marcham AQMA at its closest point. It is considered that there are no proposed dust-generating construction activities that could not be managed using normal good practices (IAQM construction dust guidance, 2016). However, although residual effects are unlikely, its proximity to Marcham AQMA and high sensitivity receptors, means it may be considered less favourable than the other option routes. **Note in 2021, air quality monitoring undertaken by Vale of White Horse District Council reported a maximum annual mean NO_2 concentration of 31.3 $\mu g/m^3$ (Environmental Quality Standard of 40 $\mu g/m^3$) within the AQMA.	Air Quality
ENV19B	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the operation of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	A	Based on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), there is the potential for a significant effect, but can be appropriately mitigated. Residual significant effects are avoided or are not likely.	Based on the number and sensitivity of nearby receptors, it is considered that there are no proposed dust-generating operational activities that could not be managed using normal good practices to prevent significant effects at any off-site receptor. However, although residual effects are unlikely, the close proximity of Road C to Marcham AQMA means this Option is considered the least preferred option. **Note in 2021, air quality monitoring undertaken by Vale of White Horse District Council reported a maximum annual mean NO2 concentration of 31.3 $\mu g/m^3$ (Environmental Quality Standard for NO_2 is 40 $\mu g/m^3$) within the AQMA.	Air Quality
ENV20A	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the construction of the option	Professional judgement.	R	Complete or very noticeable changes to visual amenity of local community	Construction activities would lead to very noticeable changes to visual amenity of local community on the eastern edge of Marcham and to a lesser extent affect the visual amenity of the community on the western edge of Drayton. This would in part be due to lighting during occasional night-time construction works.	Landscape & Visual
ENV20B	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the operation of the option	Professional judgement.	R	Complete or very noticeable changes to visual amenity of local community	Traffic and highway infrastructure would lead to very noticeable changes to the day-time visual amenity of the local community on the eastern edge of Marcham and affect the visual amenity of the western edge of Drayton to a lesser extent (due to the presence of intervening pylons, overhead lines, traffic and highway planting along the A34). The effect on Marcham would remain significant even when mitigation has established. Effect of limited lighting at night on visual amenity may not be possible to fully mitigate, although it would be seen in context of existing light pollution within Marcham and lighting associated with the A34 and Abingdon further east.	Landscape & Visual
ENV21A	Minimise impacts associated with solid discharge during construction.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road construction likely to be readily controlled using standard construction mitigation	Pollution
ENV21B	Minimise impacts associated with solid discharge during operation.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road operation likely to be readily controlled using standard mitigation	Pollution
Community and Planning Considerations						
CPC1	Distance to the nearest property that will stay during construction (metres)	GIS	R	Less than 250m from the nearest property	Nearest property is 100m away	Socio-Economic
CPC2	Minimise impacts on local community during construction associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during construction	Construction of the new road may result in disruption for those traveling to/from Marcham Church Of England Primary School which is less than 400m west of where the proposed road meets the A415. Part of the A415 Marcham Road may be shut or traffic may be limited to facilitate construction. With secondary schools within Abington it is expected that those who live in Marcham to travel via the A415 to school. Users may experience disruption (delays) from potential closures. Abingdon hospital lies east of the new road and potential disruption of this road may affect ease of access for medical facilities. Construction of the A415 to SESRO Road A may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). Mitigation minimising disruption to schools and hospitals is recommended.	Socio-Economic
CPC3	Minimise impacts on local community during operation associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during operation	Operation of the A415 to SESRO Road C does not directly affect community assets. The road itself when complete does result in the severance of multiple PRoWs. Although these PRoW are away from residential areas, they could link Drayton to Marcham and community assets in each area (schools). It is possible mitigate this impact by maintaining crossings for the PRoW.	Socio-Economic
CPC4A	Are public rights of way (PRoW) disrupted or adversely affected?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Recreational resources / rights of way of local importance are disrupted or affected. The site is likely to affect public rights of way	Construction and operation of the A415 to SESRO Road C may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to mitigate this impact by maintaining crossings for the PRoW.	Socio-Economic
CPC4B	Are there opportunities to create or improve linkages of Public Rights of Way (PRoW) and recreational routes?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Links to a recreational resource / right of way of local importance can be enhanced	Construction and operation of the A415 to SESRO Road C may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to not only mitigate this impact but to enhance the crossings and create a path between Drayton and Marcham that attracts use. The PRoW will also link with the old and proposed WB canal path therefore mitigation should consider this potential benefit or negative impact if not addressed.	Socio-Economic

CPC5	Maximise potential opportunity for recreational benefits	GIS analysis of PRoW, open spaces, cycle routes, canals, other forms of regional/nationally important receptors (eg National Cycle Routes), and community assets.	A	Option allows some additional recreational benefits to be realised	Construction and operation of the A415 to SESRO Road C may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to not only mitigate this impact but to enhance the crossing and create a path between Drayton and Marcham that attracts use. The PRoW will also link with the old and proposed WB canal path therefore mitigation should consider this potential benefit or negative impact if not addressed.	Socio-Economic
CPC6	Support the realisation of socio-economic incentives on SESRO, including employment, skills, tourism, sustainable travel, connecting people with nature and environmental education	GIS analysis of footprint, community assets, private residents, and businesses. Also awareness of overall project objectives is needed to conclude if the designs align with these.	A	Site supports some of the social-economic incentives of the overall scheme	Construction of the new road may affect operation/attendance of key socio-economic assets (schools in Marcham, Abingdon and Drayton). Abingdon hospital lies east of the new road and potential disruption of this road may affect access to medical facilities. Construction of the new road facilitates wider socio-economic goals of the project (employment, education etc.) but has some potential to create temporary disruption on roads and permanent disruption on PRoW if not mitigated correctly.	Socio-Economic
CPC7	Minimise overall SESRO Order Limits extent and land acquisition, without compromising SESRO needs and project benefits	Spatial comparison of land that would likely be included in the DCO Order Limits, including construction working areas, access and highways or PRoW interactions.	A	Requires minor additional Order Limits extent	Lies outside the area currently safeguarded in the VoWH Local Plan.	Consenting
CPC8	Aim for consistency with published and (insofar as possible) emerging Local Plan land use allocations	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in existing and any emerging Local Plan documents and any Supplementary Planning Documents.	G	Low or no impact	Lies outside the SESRO safeguarded area in policies CP14 and CP14a. Includes land safeguarded for strategic highway improvements within the Abingdon-on-Thames and Oxford Fringe Sub-Area (policy CP12 and CP12a). The safeguarded site is South Marcham Bypass linking the A415 to the west of Marcham and east of Marcham. There is potential for the road to provide the eastern section of the South Marcham Bypass. Also adjacent to residential allocation Policy 24 - South east of Marcham in the VoWHDC Local Plan and so potential for the road to offer access to the scheme. This remans the same for the consultation draft Joint Local Plan 2041. No land use allocation conflicts with the Oxfordshire County Council Minerals and Waste Local Plans. Not within the area of the South Oxfordshire District Council Local Plan.	Consenting
CPC9	Aim for consistency with any adopted Neighbourhood Plan policy applicable to the land area affected	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in any made Neighbourhood Plan.	G	Low or no impact	The road lies within both the made Drayton Neighbourhood Plan (adopted July 2015) and the area of Marcham, which is in the plan preparation stage. The Drayton NP outlines traffic as a problem in the Parish; when there are incidents on the A34, the B4017 that goes through the middle of Drayton is used as a relief road. Providing an alternative route to the A34 will help relieve this pressure. There are no draft plans available for Marcham at this stage.	Consenting
CPC10	Avoid development of infrastructure within specifically designated areas or their setting, as applicable (e.g. Green Belt, AONB, Common Land, Open Space)	Spatial comparison with designated sites, their settings, and the nature of development works expected.	G	Does not require development of above-ground infrastructure within these designations or development likely to have more than a negligible effect on the setting (where applicable)	Not located within a specifically designated area, such as Green Belt, AONB, Common Land or Open Space.	Consenting
CPC11	Avoid encroachment on any safeguarded land in minerals and waste policy, unless the minerals can be beneficially utilised as a result	Spatial comparison of allocated sites and review of policy wording in existing and any emerging Waste and Minerals Local Plan documents.	G	Low or no impact	Not located in minerals safeguarding area or on a site allocated for minerals or waste uses.	Consenting
CPC12	Ability to integrate with existing nationally-significant infrastructure, statutory undertakers' major infrastructure, or any proposed future Nationally Significant Infrastructure Projects (NSIP) (such as that of National Highways, Environment Agency, Network Rail)	Review of NSIP projects on PINS's register; review of Network Rail and National Highways investment plans; spatial review of statutory undertakers' assets.	G	Low or no interaction with existing infrastructure or proposed Nationally Significant Infrastructure Project (NSIP)	No NSIPS currently registered. No known proposals from Network Rail or National Highways. The National Highways RIS3 Investment Plan will be published in 2024 which will detail the A34 improvement project. Compatible with the South Marcham Bypass (although this would not be a NSIP if it were to go ahead). Road C would be likely to preclude the use of the road as a flood alleviation scheme (under consideration by the Environment Agency and as safeguarded under VoWH Local Plan policy CP14) because the amount of flood storage that could be provided would be substantially reduced. Existing high-voltage mains lines cross road C in several locations. An electric line, water line and telecoms line also crosses the road.	Consenting
CPC13	Minimise the consenting complexity due to the need for additional consents and licenses that may be required outside the Development Consent Order (DCO), e.g. additional Flood Risk Activity Permit, Environmental Permit, abstraction/discharge Licence, European protected species licence, etc	Review of the nature of expected development works against the list of other consents and licenses developed at Gateway 2.	A	One or more additional consent/license required	Roads A, B, C and D cross over multiple PRoW and so a Temporary Traffic Regulation Order may be required, although this can potentially be included within the DCO application. A section 278 highways agreement, street works notice and highway works permit will also likely be necessary, although could also be included within the DCO. The location of Roads A, B, C and D within areas of Flood Zone and Abingdon Flood Alleviation Scheme may also require a Standard or Bespoke Flood Risk Activity Permit or a Flood Risk Activity Exemption permit from the Environment Agency, but these will be required anyway for other reservoir works. Likelihood of at least one European protected species relocation licence required.	Consenting

CPC14	Avoid or minimise the need for any consequential development consenting (i.e. displacement or alteration of other development)	Review of existing development within the likely land-take, its nature and scale.	G	No existing development requires planning permission to relocate or alter	Existing high-voltage, electric, water and telecoms lines will need to be diverted as pass through Road C. However, this can form part of the DCO associated development or potentially be delivered through statutory undertaker permitted development.	Consenting
CPC15	Minimise interfaces/reliance on external governing/third parties (e.g. Removing the canal removes a stakeholder, reducing interfaces and permissions required from Network Rail, National Highways, National Grid)	Review GIS layers for services against the options. Expert Judgement.	A	Several manageable interfaces with others	All options score similarly because each would have interactions. Option C has an interface potentially with Marcham Bypass.	Consenting
CPC17	The option provides economic benefits by directing traffic through local town centres which will boost their footfall and potential for people to stop and utilise their local economy	Expert judgement	G	The routes for this option do not provide a bypass of local towns and villages. Therefore, this option may boost the local economy of these towns and villages as people may be more likely to stop and visit the local businesses here.	Access road to site only.	Transport Planning
CPC18	Influence the location and layout of development to maximise the use and value of existing and planned sustainable transport investment	Expert judgement	G	Option supports existing and planned public transport infrastructure between key destinations	The junction which provides access to the existing road network is nearer to Marcham than Abingdon. This provides more favourable access for pedestrians and cyclists via Marcham and is more likely to promote active and sustainable journeys from Marcham rather than Abingdon. Access will also be provided to the site via local bus routes.	Transport Planning
CPC19	Maximise the benefits of travel for non-motorised users between key destinations	Expert judgement	G	Provides numerous routes with infrastructure that prioritises non-motorised users to encourage users to walk, cycle or use bridleways	Access road to site only. Shared use footways beside the road may encourage users to use non-motorised transport to get to the reservoir or other recreational facilities.	Transport Planning
Property & Land Acquisition						
PRP1	Minimise loss of sensitive properties, i.e. residential, commercial, green belt, common land, historical or community assets due to project delivery	Review Land allocation mapping on ArcGIS.	G	No permanent or temporary loss of sensitive properties	Land is all agricultural.	Property & Land Acquisition
PRP2	Minimise loss of land allocated within the Local Plan for alternative higher value / social / cultural value uses, e.g, residential, historical or community assets due project delivery	Review Land allocation mapping on ArcGIS.	G	No permanent or temporary loss of allocated land for higher value or social value properties	Road option C, does not immediately impact on residential planning permission.	Property & Land Acquisition
PRP3	Minimise permanent loss of best and most versatile agricultural land (grades 1, 2 and 3)	Review of agricultural grading layer on ArcGIS, based on 2019 Provisional Agricultural Land Classification	A	Results in loss of any Grade 2 agricultural land or >50% Grade 3 agricultural land	Agricultural land approximate percentage: grade 3 = 69% grade 4 = 31%	Property & Land Acquisition
PRP4	Assessment of Land and Property asset costs and associated compensation due under the Compensation Code	Review of land use / designation on ArcGIS	G	Land acquisition costs likely to be relatively low.	Agricultural land values can range from £8,000 - 14,000 in the area. Landowners may be eligible for Severance claims depending on design and farm practices.	Property & Land Acquisition
PRP5	Assessment of Special Category Landowners (SCLs), utility infrastructure, national asset protection agencies and Crown bodies	Review of affected landowners	G	No SCL on identified option	Sensitive Landowner only: Earl of Plymouth estates.	Property & Land Acquisition
PRP6	Minimise disruptions of landowners access to their land required for temporary works	Review location in conjunction with existing road network	G	Landowners able to access their land during construction and operation phases	Landowners able to access their land during construction and operation phases.	Property & Land Acquisition

Appendix D SESRO Access Road Option D Criteria Workbook

A415 to SESRO Road D

Criteria code	Criteria Description	Method of Assessment	RAG	Description of RAG	Narrative	Sub-Theme
Constructability						
CON1	Safety - Risk of endangering construction workers or members of the public during construction e.g. water, ground, height, rail, road and utilities	Look at programme and list types of construction involved. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	A	Works can be constructed safely but enhanced control measures required	Option D requires 7 crossings and requires 1.7km of 132kV HV Overhead diversions and a gas diversion over the ADC. These would increase the risk of endangering workers and require enhanced measures, and is therefore rated amber.	Health and Safety
CON2A	Programme - Duration, longest /shortest, but also consider whether the longer duration has an impact on the overall scheme programme	Compare differences in the programmes which would materialise from different options. Consider earthworks seasons.	A	Likely to extend the duration of the relevant area of works (e.g. road, rail siding or intake/offtake construction) compared to the Gate 2 SESRO programme but unlikely to impact on the critical path of the Gate 2 SESRO programme.	Option D has a length of 2.6km and an estimated 91,000m3 of fill. Option D has an alignment which relatively close to the A34 which brings in the opportunity for the bridge across the ADC to also be used for the gas diversion and (potentially) to help facilitate the temporary diversion of the A34 to allow the construction of the ADC box culvert. The crossing of the ADC for Option D is thought to increase the challenge associated with the gas diversion and the construction of the ADC box culvert.	Programme
CON2B	Programme - Opportunities for construction programme acceleration through efficiencies	Compare differences in the programmes which would materialise from different options.	A	The option has limited potential to introduce programme efficiencies and reduce the construction programme	If construction access can be temporarily provided from the A34 layby then construction traffic can be allowed from both ends of the road. In addition to this, for Option D, the alignment provides an opportunity to reduce the construction programme associated with the gas diversion and the ADC box culvert below the A34.	Programme
CON2C	Programme - Dependencies i.e. proximity or physical relationships between elements of scope that introduce programme dependencies	Is the options on the critical path? Will it impact other critical activities?	A	Several major dependencies/ multiple minor dependencies	The A415 to SESRO Access Road, and other haul roads need to be constructed prior to construction of the rail sidings. This option, therefore, has multiple minor dependencies and scores amber.	Programme
CON2D	Programme - Risk	Are there items in the construction which have a significant programme risk	A	Moderate programme risk	Option D has some utility diversion requirements, and is in a flood zone. It is therefore considered to have moderate programme risk and is rated amber.	Programme
CON3A	Logistics - Space available for construction and materials storage	Determine space constraints using GIS and options layouts from option definition.	A	Limited / restricted space	Option D has a lot of space on the west side for construction compounds and Replacement Floodplain Storage (which will be needed to account for the road embankment which is located within the current floodplain).	Logistics
CON3B	Logistics - Suitable and efficient access for construction workers, deliveries and waste removal including minimisation of lengths of new roads for access during construction	Determine method of access using GIS and options layouts from option definition.	G	Adequate access is available, and only short length (relative) of road is required for construction	A415 to SESRO Access Road itself is providing access for construction workers and deliveries.	Logistics
CON3C	Logistics - Import of materials or resources during construction	Use quantity estimates to assess different options.	A	Moderate amount of import materials required	The A415 to SESRO Access Road requires the import of materials for the road surface. The earthworks required for the road embankment are assumed to be sourced from the site. This option is assessed as amber because access to construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.	Logistics
CON3E	Logistics - Vehicle movements	Use vehicle movement estimates to assess different options.	A	Construction likely to add vehicle movements.	The number of vehicle movements will be related to the length and earthworks required. This option is assessed as amber because access to the construct the road is assumed to be available only from the A415, so the length/number of vehicle movements cannot be easily reduced.	Logistics
CON4A	Construction Complexity - Temporary conditions/works requirements e.g. embankment slope stability and moisture outside of placement seasons.	Expert Judgement	G	Temporary Works requirements minimal and can be used in the permanent state and no extension to the programme	This option is assessed as green because the temporary state can be easily adopted to a permanent state i.e. an initial subbase may be laid on top of an embankment and then later used as part of the permanent state. Option D has 7 crossings, 3 of which are likely need to a bridge.	Construction complexity

CON4B	Construction Complexity - Location conflict/opportunity with another engineering component of the scheme or other SRO/non-SRO schemes, e.g. Severn to Thames Transfer (STT), Thames to Southern Transfer (T2ST), TW Swindon and Oxfordshire supply zone transfer, Transfer to Farmoor Reservoir	Expert judgement and knowledge of surrounding schemes	A	Location / layout of the option neither clashes nor provides an opportunity to be developed with another component of this scheme (or another scheme)	Potential for conflict with / interaction with the proposed South Abingdon Bypass Scheme and / or the Abingdon Flood Alleviation Scheme. At this stage, these can be viewed as a conflict or an opportunity. In addition to this, Option D has a potential to need to share the roundabout junction with the Dalton Barracks housing development scheme, which could increase construction complexity.	Construction complexity
CON4C	Construction Complexity - Minimise the number and complexity of additional structures/assets required or modifications to the existing structures/assets in order to facilitate the option, e.g. bridges, culverts, crossings	Determine using GIS and options layouts from option definition.	A	Option requires a moderately complex (mitigation likely) and/or moderate number of additional structures and/or modification to existing structures.	Option D scores amber as it requires a moderate number of new structures (7 crossings)	Construction complexity
CON5A	3rd Party Impact - Potential to disrupt existing road network during enabling works and construction	Expert judgement	A	Disruption likely to be moderate	This option is assessed to have a moderate impact on traffic because construction material will be delivered to site by road; however, the rate of deliveries is expected to be on average below 20 HGVs per day, assuming reservoir materials are brought in via train.	3rd Party Impact
CON7A	Ground - Terrain of site, and implications for the need for earthworks and engineered slopes	Use of lidar and civil 3D models to assess amount/location of earthworks required	A	Terrain is unfavourable to the design of assets and therefore increases the amount of earthworks required	Option D crosses the relatively flat River Ock floodplain. Option D is not aligned close to the A34. Option D estimated fill is 91,000m3.	Construction complexity
CON7B	Ground - Risk of unexpected conditions	Use of expert judgement based on comparable areas	A	Moderate exposure to risk of unexpected ground conditions.	The road option passes through the undeveloped floodplain of the River Ock, so there is a moderate risk for unexpected ground conditions. There is a possibility of high water table from the River Ock.	Construction complexity
CON7C	Ground - Impact of ground conditions on the complexity of design and construction	Use of expert judgement	G	Ground conditions are unlikely to increase the complexity of design and construction with likely only a minimal (if any) impact on cost or requirement for materials that are difficult to source	The road option passes through the undeveloped floodplain of the River Ock, so there is a moderate risk for unexpected ground conditions. Ground conditions are unlikely to increase the complexity of design.	Construction complexity
Operability						
OPS1A	Safety - Risk of endangering operational staff, visitors or members of the public during operation	Look at operational activities and public access. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	G	Works can be operated safely without enhanced control measures	The road design follows best practice such as the Design Manual for Roads and Bridges regarding elements such as the speed limit, bend radii, gradients and drainage.	Health and Safety
OPS1B	Safety - Access and egress for operational staff, visitors, deliveries and waste removal during normal operations and emergencies	Tunnel silt issue to be considered by expert judgement	G	Access/egress can be provided	The road design follows best practice such as the Design Manual for Roads and Bridges, allowing for sufficient access/egress in emergencies.	Health and Safety
OPS2A	Maintenance - Ease of maintenance	Expert judgement	G	Majority of maintenance activities could be undertaken during limited closure periods and / or with limited disruption	This road option will be accessible for maintenance. It is anticipated that it could be closed for maintenance during times of low traffic movement (i.e. at nights and/or weekdays), or be undertaken so that a single lane is kept open to minimise disruption.	Operational Complexity
OPS4A	Reliability - Footprint of the option within flood zones (as an indication of the potential for damage and the challenge of operation / maintenance during flood events)	Review GIS supported by expert judgement	A	Option is within the flood zone, however damage is not considered to be a significant risk	Option is within the flood zone, however damage is not considered to be a significant risk as option will be designed (i.e. elevation, drainage) to withstand predicted flooding without damage.	Operational Resilience
OPS4B	Reliability - The option does not have a single point of failure but rather includes backup infrastructure so that it can remain in operation if the primary infrastructure is unavailable, e.g. siphons in addition to tunnel for emergency discharge or alternative road route to reservoir crest	Expert judgement	A	There is a single point of failure but mitigation measures can be introduced to allow for continued operation, which might be a delayed or reduced service	In a scenario where the A415 to SESRO Access Road is out of operation it is assumed that access would be provided for operational vehicles via retained haul roads and the proposed local car park at the end of the Hanney Road "stub" outside of Steventon.	Operational Resilience

OPS5A	Adaptability - Space available for future expansion of social / recreation infrastructure	Expert judgement	G	Opportunity / adequate space for envisaged expansion	No expansion envisaged; however no constraint identified to future expansion, albeit impact on the floodplain would need to be assessed during design.	Operational Resilience
OPS5B	Adaptability - Flexibility for future modifications e.g. increasing reservoir storage volume, rail station at wantage and grove, construction of Marcham Bypass	Expert judgement	A	Option includes a limited degree of flexibility for future modifications	Option D alignment offers the opportunity for dual functions (for the South Abingdon Bypass). However, Option D is unlikely to facilitate the potential Abingdon Flood Alleviation Scheme.	Operational Resilience
OPS8A	3rd Party Impact - Potential to disrupt existing road network during operation	Expert judgement	A	Disruption likely to be limited	The Option D junction location was tested with indicative traffic flows, which indicated they can be managed appropriately. Junction location is set away from the A34 to decrease the risk of impact on the A34.	Transport Planning
OPS8C	3rd Party Impact - Option facilitates infrastructure for other modes of transport, including pedestrians, cyclists and other non-motorised users	Expert judgement. Review GIS for PRoW, cycle routes, etc.	G	Option provides segregated cycle facilities, a footway that is wider than 2m, and suitable crossing infrastructure is provided for pedestrians and cyclists. Additional Bridleways or improvements or maintenance provided to existing bridleway routes are also included	PRoWs can be linked across the site creating new routes to surrounding area. The options are considered to score similarly against this criteria.	Transport Planning
OPS8D	3rd Party Impact - Congestion at the relevant junctions for all movements, and the effective use of the transport network through innovative solutions	Expert judgement	A	Option provides a partial solution to delivering roads that will be effectively able to deal with traffic upon completion. However, the junctions designed may be unable to cope with traffic flows in future years.	Initial modelling illustrates capacity at highway junctions reduces over time, however, this is can be managed.	Transport Planning
OPS8E	3rd Party Impact - Impact on journey time reliability	Expert judgement	A	Option is not expected to either increases or improve journey times for road users on the road network	Initial modelling illustrates capacity at highway junctions reduces over time, however, this is can be managed.	Transport Planning
Relative Costs						
COS1	Capex cost of the option	Cost estimate calculation for each option.	G	CAPEX estimated to result in an increase of <1% of the CAPEX for the overall SESRO project compared to the lowest cost option	Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 0.4% of the total SESRO costs. Option D is the lowest cost option.	Cost
COS3	Opportunity for cost-sharing with other SROs, NSIPs and local non-SRO schemes/plans, e.g. STT, T2ST, SWOX/Farmoor, Abingdon flood storage	Cost estimate calculation for each option.	A	Limitied opportunities identified for cost saving.	Option D provides an opportunity for cost-sharing with the South Abingdon Bypass Scheme - but not the Abingdon Flood Alleviation Scheme.	Cost
Carbon Costs						
CAR1	Carbon costs associated to the Capex of the option	Carbon estimate calculation for each option.	G	Emissions (tCO2e) estimated to result in an increase of <1% of the emissions (tCO2e) for the overall SESRO project compared to the lowest emissions (tCO2e) option	Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option D is the lowest carbon option.	Carbon
CAR3	Opportunity for mitigation e.g. smaller earthworks may lead to less carbon	Carbon estimate calculation for each option.	G	High likelihood and magnitude of mitigation opportunity.	Option D is a relatively short route and requires less fill for its embankments.	Carbon
Environmental Performance						
ENV1A	Minimise impacts on Special Area of Conservation (SAC)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SAC's or potential SAC's within the boundary of the proposed A415 option D road. The closest SAC to the road is Cothill Fen SAC located approximately 2.8Km to the north.	Biodiversity and Nature Conservation
ENV1B	Minimise impacts on Special Protection Area (SPA)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SPA's or potential SPA's within the boundary of the proposed A415 option D Site. The closest SPA to the proposed road is Thames Basin Heaths SPA located approximately 43Km to the south-east.	Biodiversity and Nature Conservation
ENV1C	Minimise impacts on Ramsar	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no Ramsar sites or potential Ramsar sites within the boundary of the proposed A415 Option D. The closest Ramsar site to the Road is South-west London Waterbodies located 58Km to the south-east.	Biodiversity and Nature Conservation
ENV1D	Minimise impacts on Site of Special Scientific Interest	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	Road is located within the Impact Risk Zone for Barrow Farm Fen SSSI. However, impacts are considered unlikely due to the distance the works are located away from the SSSI.	Biodiversity and Nature Conservation

ENV1E	Minimise impacts on National Nature Reserve	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no NNR within the boundary of the proposed A415 option D site. The closest NNR is located 2.7Km to the north. Cothill NNR.	Biodiversity and Nature Conservation
ENV1F	Minimise impacts on Local Nature Reserve (LMN)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no LNR within the boundary of the proposed A415 Option D. The closest LNR to the Road is located 4.7Km to the east of the site. The site is called Abbey Fishponds LNR.	Biodiversity and Nature Conservation
ENV2A	Minimise impacts on Ancient Woodland	Natural England Ancient Woodland Maps and Professional Judgement.	G	No ancient woodland impacted	Historic mapping indicates that there is no ancient woodland present on-site	Biodiversity and Nature Conservation
ENV2B	Minimise impacts on Ancient and Veteran Trees	Woodland Trust Ancient Tree Inventory map search and professional judgement	A	Development in close proximity with potential indirect impact to ancient or veteran trees	There are no ancient or veteran trees recorded by the Woodland Trusts Ancient Tree Inventory on or close to this option. However, survey may identify trees that could be classified as ancient or veteran. As such, this option scores amber on a precautionary basis pending survey.	Biodiversity and Nature Conservation
ENV2C	Minimise impacts on Protected Trees	Check against published TPO dataset.	G	No protected trees impacted	No protected trees would be impacted.	Landscape & Visual
ENV2D	Minimise impacts on vegetation (including trees, woodland, hedges and shrubs)	Check against baseline resources and based upon high level knowledge of site from previous site visits. Professional judgement.	G	No direct impact on vegetation which is of high arboricultural/amenity value (A or B grade) or biodiversity habitat in good condition. OR Limited direct impact on vegetation which is of lower arboricultural/visual amenity value (e.g. C grade) or biodiversity habitat in poor condition.	Construction of the road will require the removal of vegetation belts at several field boundaries, including a limited section of a woodland belt. It is assumed that few if any A or B grade trees are likely to be impacted.	Biodiversity and Nature Conservation and Landscape
ENV3	Minimise impacts on Local Wildlife Sites (LWS)	Professional Judgement and LWS Citation provided by TVERC.	G	No impacts to LWS	There are no LWS located within or adjacent to the boundary of the A415 Option A. The closest LWS to the road is located approximately 1.1km to the south-west (Marcham Salt Spring).	Biodiversity and Nature Conservation
ENV4A	Minimise impacts on Scheduled monuments or activities which could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The site north of Cow Lane scheduled monument lies just under 650m from the north of the route option.	Historic Environment
ENV4B	Minimise impacts on listed buildings or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	The nearest listed building to the option alignment is the Grade II* listed Hyde Farmhouse 380m to the north-west.	Historic Environment
ENV4C	Minimise impacts on Registered Parks and Garden or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The Albert Park RP&G lies in Abingdon 2.3km north-east of the option alignment.	Historic Environment
ENV4D	Minimise impacts on Registered Battlefields or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The 1643 Battle of Chalgrove Registered Battlefield lies over 15km to the east of the option alignment.	Historic Environment
ENV4E	Avoid impacts on World Heritage Sites or activities that could lead to a loss of significance, including setting	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	Blenheim WHS lies 18km to the north.	Historic Environment
ENV4F	Minimise impacts on conservation areas which could result in loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest conservation area is Drayton which lies approximately 700m south-east of the option alignment.	Historic Environment

ENV5A	Minimise loss to non-designated built heritage	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Extensive loss of non-designated built heritage of low value within the permanent infrastructure zone and adverse changes to within a 500m area from the edges of the permanent infrastructure OR more limited effects on non-designated built heritage of medium value	There are no known non-designated historic structures along the line of the option or adjacent to it.	Historic Environment
ENV5B	Minimise loss to paleoenvironmental remains	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	A	Extensive scale of loss or damage to medium value remains within the construction area and adverse changes to similar buried remains in a 1km area around the permanent infrastructure from temporary and permanent changes to local hydrogeological regimes OR more limited effects on remains of high value	As the route crosses the River Ock, there are likely to be buried paleoenvironmental remains, but the extent and significance of these is not currently known.	Historic Environment
ENV5C	Minimise loss to non-designated historic landscapes	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or extensive changes to low value non-designated historic landscapes within the construction area and extensive changes to the setting of the same resource outside the permanent infrastructure OR more limited effects on non-designated historic landscapes of medium value	There are no such assets present within the Oxfordshire Historic Environment Record along the route option or adjacent to it.	Historic Environment
ENV5D	Minimise loss of non-designated archaeological remains	Professional judgement, incorporating the use of the IEMA's Principles of Cultural Heritage Assessment in the UK and the Chartered Institute for Archaeologists standard and guidance document for desk based assessment	A	Permanent infrastructure and construction area will result in the loss and / permanent damage to non-designated buried and extant archaeological remains worthy of regional significance which can only be partially mitigated through preservation by record	The route option passes through an Iron Age and Romano-British field system, which is assumed a regional heritage value using a worst case scenario	Historic Environment
ENV6A	Minimise loss of fluvial flood storage within Flood Zone 2 or 3	Measure using GIS	A	Site is within flood zone 2 and 3 but loss of storage is minor or mitigation is available	Option is not considered to have a significant impact on fluvial flood risk, 1050m length of road is sited within flood zones but sufficient space has been provided for Replacement Floodplain Storage along the watercourse diversions.	Flood Risk
ENV6B	Minimise impacts of pluvial flood risk.	Expert judgement	G	No predicted impacts on pluvial flood risk	Option is not considered to have a significant impact on pluvial flood risk as it is a single carriageway. The options are considered to score similarly against this criteria.	Flood Risk
ENV6C	Minimise impacts of groundwater flood risk.	Checking existing national and local records	G	No predicted impacts on groundwater flood risk	Option is not considered to have a significant impact on groundwater flood risk. The options are considered to score similarly against this criteria.	Flood Risk
ENV7A	Minimise disturbance of potentially contaminated land	Checking existing national and local records	G	Minimal or no disturbance of contaminated land unlikely to cause cost or program implications or harm to potential receptors. No remediation required	There are unlikely to be contamination sources within 250m of this option other than the Marcham Road and infilled canal which cross the site.	Land
ENV7B	Minimise disturbance of potentially contaminated land specifically in relation to authorised and historic landfills	Checking existing national and local records	G	Not within authorised and historic landfills or previous industrial sites or within 250m of authorised and historic landfills or previous industrial sites	There is no authorised or historical landfill within 250m of this option	Land
ENV8	Minimise disturbance of land with known potential for Unexploded Ordnance (UXO)	Checking existing national and local records	A	Disturbance of a low quantity of UXO which can be easily managed / remediated. Unlikely to have significant cost or program implications	A pre-desk study assessment from Zetica acquired for gate 2 identified various potential UXO risks across the SESRO area, therefore, recommend a detailed UXO survey of the area. Specifically an early 20th century rifle range was in use in the area of this option.	Land
ENV9A	Minimise loss of terrestrial priority habitats (use narrative to describe type and quantum)	Use of aerial imagery, MAGIC maps and Professional Judgement	A	Priority habitat directly impacted but mitigation feasible	Construction of the road will require the removal of Floodplain Grazing Marsh, Deciduous Woodland and Hedgerows which are all listed as Priority habitats. The River Ock will also be crossed which is also a Priority habitat.	Biodiversity and Nature Conservation
ENV9B	Minimise loss of aquatic priority habitats (use narrative to describe type and quantum)	Professional judgement based on knowledge of Water Framework Directive.	A	Priority habitat directly impacted but mitigation feasible	Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the any WFD waterbody to reduce potential impacts.	Aquatic Environment

ENV10A	Reduce effects on North Wessex Downs Area of Outstanding Natural Beauty (AONB) and its setting	Professional judgement.	A	AONB and its setting likely to be affected. Effect is unlikely to be significant.	The introduction of traffic, highway infrastructure and limited lighting into the rural and generally undeveloped landscape would interrupt the small to large-scale field pattern divided by hedgerows and tree/woodland belts along watercourses which would erode a key characteristic which contributes positively to the local landscape character and setting of the North Wessex Downs AONB. Effect on landscape character and tranquillity of AONB could be mitigated to avoid a significant effect, particularly given the distance involved and the presence of existing highway infrastructure within the setting.	Landscape & Visual
ENV10B	Reduce effects on local landscape character	Professional judgement.	R	Effect on local landscape character is likely to be significant.	The introduction of traffic, highway infrastructure and limited lighting into the rural and generally undeveloped landscape between Marcham and the A34, would erode the levels of tranquillity and interrupt the small to large-scale field pattern divided by hedgerows and tree/woodland belts along watercourses. This would erode a key characteristic which contributes positively to the local landscape character and introduce components which are not characteristic. Effects are likely to be significant locally even with established mitigation in place.	Landscape & Visual
ENV11A	Reduce effects on panoramic views from national trail, open access land and important viewpoints in AONB	Professional judgement.	G	Panoramic views from national trail, open access land and important viewpoints in AONB unlikely to be affected or the proposal is likely to be barely discernible in views.	Given the distance, traffic and highway infrastructure on the new road is likely to be barely discernible in panoramic views from The Ridgeway National Trail once mitigation has established.	Landscape & Visual
ENV11B	Reduce effects on sensitive local visual receptors	Professional judgement.	R	Effect on local views of sensitive visual receptors likely to be significant.	Traffic and highway infrastructure is likely to be visible in local views from some PRoWs and residential properties on the eastern edge of Marcham. There would also be some filtered views through existing vegetation from the western edge of Drayton, seen in the context of existing pylons, overhead lines and traffic on the A34. Effects on most views could be reduced in the long term, but some significant effects may remain.	Landscape & Visual
ENV12	Minimise disturbance/encroachment into Air Quality Management Area (AQMA)	Based on an understanding of the scale and nature of activities, air quality management areas (AQMAs) were identified in close proximity to the proposed works.	A	Within 1km of an AQMA OR some construction traffic must go through an AQMA	Marcham AQMA is approximately 400 m W of the Road D access point. Although the anticipated construction and operational activities would likely lead to a negligible change in air quality (assuming construction traffic and the majority of tourists travel E along the A415), the proximity of the AQMA means Road D is assigned an amber score.	Air Quality
ENV13	Minimise disturbance/encroachment into Groundwater Source Protection Zone (SPZ)	Magic maps	G	Site is within Zone 3 or not within a SPZ	Site is not within an SPZ.	Aquatic Environment
ENV14A	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Cow Common Brook and Portobello Ditch' WFD waterbody (GB106039023360) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration -** Crossing on Cow Common Brook is over the proposed watercourse mitigation area. This would need to be re-evaluated and potentially alternative mitigation found should this option be taken forward. Any other impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment

ENV14B	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ock and tributaries (Land Brook confluence to Thames)' WFD waterbody (GB106039023430) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - Crossing on River Ock is nearer to A34 crossing, on a straight section, reducing the area of impact. Any impacts to the hydrological, ecological and/or geomorphological functioning of the river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14C	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Thames (Evenlode to Thame)' WFD waterbody (GB106039030334) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14D	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Sandford Brook (source to Ock)' WFD waterbody (GB106039023410) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14E	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Childrey Brook and Norbrook at Common' WFD waterbody (GB106039023380) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14F	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ginge Brook and Mill Brook' WFD waterbody (GB106039023660) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14G	Option does not affect Water Framework Directive (WFD) Quality Elements within one of WFD waterbodies downstream of the River Thame to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives. These WFD waterbodies include: - Thames Wallingford to Caversham - WFD waterbody GB106039030331 - Thames (Reading to Cookham) - WFD waterbody GB106039023233 - Thames (Cookham to Egham) - WFD waterbody GB106039023231 - Thames (Egham to Teddington) - WFD waterbody GB106039023232	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV15A	Maximise potential for future environmental benefits (terrestrial), e.g. increase tree planting	Professional Judgement	G	Site allows substantial additional environmental benefits to be realised	Being a predominantly arable landscape there is plenty of opportunity for environmental enhancement through the planting of trees and creation of habitats with high distinctiveness. Also opportunity for the creation of wetland areas including wet woodland and ponds.	Biodiversity and nature conservation
ENV15B	Maximise potential for future environmental benefits (aquatic), e.g. increase wetlands area	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Site allows substantial additional environmental benefits to be realised	Connectivity through the watercourse and associated wetlands is crucial. Thus any road crossings will need to consider this appropriately and mitigation provided.	Aquatic Environment

ENV16	Maximise flexibility in routing diverted watercourses so their habitats can be of sufficiently high quality to contribute to catchment Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Site allows some flexibility in routing watercourses / Good quality habitat options are available	There appear to be no / minimal interaction conflicts with the Eastern Watercourse Diversion design, although there is a single watercourse crossing. Road crossings need to ensure sufficient light and connectivity through the structure. Preference is a clear span, bridge on all crossings of principal WFD waterbodies (blue line) but an appropriately sized box culvert is acceptable on other watercourses in the WFD catchment. Pipe crossings will be deemed to be unacceptable and should be avoided.	Aquatic Environment
ENV17	Minimise disturbance/encroachment into Local Geological Sites (LGS)	Checking existing national and local records	G	Site is located more than 250m from LGS	No LGS present	Biodiversity and nature conservation
ENV18A	Minimise impacts associated with Noise and Vibration as a consequence of the construction of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment. Red band distance is from works site/road to the SOAEL+5dB, and Amber distance is from SOAEL+5dB to the SOAEL. Road Construction: Red 60m, Amber 61-99m, Green 100m. Construction Traffic: Red 40m, Amber 41-184m, Green 185m. Road Const. (bridge construction): Red 75m, Amber 81-124m, Green 125m. (NOTE: No sensitive properties have been identified within 125m of potential piling works at road bridges and significant effects are not anticipated. Distances referenced in the assessment are those measured between the proposed roads and receptors). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis (with >700 extra receptors included, namely at Diversion Road C, which is outside of Gate 2 Study Area).	G	Impacts unlikely, or adverse impacts are likely to be mitigated if they occur	The closest noise sensitive property is located over 300m from Access Road A415-SESRO Option D and, as such, no significant adverse effects are predicted.	Noise
ENV18B	Minimise impacts associated with Noise and Vibration as a consequence of the operation of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment (inc. bunding around sidings). Red band is from works site to the SOAEL+5dB distance, and Amber is from SOAEL+5dB distance to the SOAEL. Rail Sidings: Red 675m, Amber 676-1209m, Green 1210m. This is based on worst-case activity, Material Handling, which includes potential for works between 06:00 to 07:00 and was assessed using night-time noise assessment criteria at Gate 2 as a precautionary approach. The noise emission for the activity is based on G2 assumptions, with update made following review by Costain (JB 05Jun). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis.	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	The closest noise sensitive property is located over 300m from Access Road A415-SESRO Option D and, as such, no significant adverse effects are predicted.	Noise

ENV19A	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the construction of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	There are between 1 - 10 low sensitivity receptors <20 m of the proposed Road D access route. Activities include the construction of a two lane carriageway (approximately 4.1 km in length) and a total of 6 crossings. The Road D route is approximately 400 m E of Marcham AQMA at its closest point. It is considered that there are no proposed dust-generating construction activities that could not be managed using normal good practices (see IAQM construction dust guidance, 2016) to prevent significant effects at any off-site receptor. Given that relatively low numbers of plant and items of machinery would be used and the anticipated number of construction traffic is less than the criteria in the EPUK/IAQM guidance for requiring a detailed assessment, the potential effects would likely lead to a negligible change in air quality.	Air Quality
ENV19B	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the operation of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	A	Based on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), there is the potential for a significant effect, but can be appropriately mitigated. Residual significant effects are avoided or are not likely.	Based on the number and sensitivity of nearby receptors, it is considered that there are no proposed dust-generating operational activities that could not be managed using normal good practices to prevent significant effects at any off-site receptor. Given the anticipated volume of Scheme related traffic, the potential effects would likely lead to a negligible change in air quality. However, although residual effects are unlikely, the close proximity of Road D to Marcham AQMA means this Option is assigned an Amber score.	Air Quality
ENV20A	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the construction of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Construction activities would lead to noticeable changes to the visual amenity of the local community on the eastern edge of Marcham and to a lesser extent affect the visual amenity of the community on the western edge of Drayton. This would in part be due to lighting during occasional night-time construction works.	Landscape & Visual
ENV20B	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the operation of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Traffic and highway infrastructure would lead to noticeable changes to the visual amenity of the local community on the eastern edge of Marcham and affect the visual amenity of the western edge of Drayton to a lesser extent (due to the presence of intervening pylons, overhead lines, traffic and highway planting along the A34). The effect on day-time visual amenity could be mitigated in the long term. Effect of limited lighting at night on visual amenity in Marcham may not be possible to fully mitigate, although it would be seen in context of existing light pollution within Marcham and lighting associated with the A34 and Abingdon further east.	Landscape & Visual
ENV21A	Minimise impacts associated with solid discharge during construction.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road construction likely to be readily controlled using standard construction mitigation	Pollution
ENV21B	Minimise impacts associated with solid discharge during operation.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road operation likely to be readily controlled using standard mitigation	Pollution
Community and Planning Considerations						
CPC1	Distance to the nearest property that will stay during construction (metres)	GIS	A	Between 251m and 500m from the nearest property	Nearest property is 380m away	Socio-Economic

CPC2	Minimise impacts on local community during construction associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during construction	Construction of the new road may result in disruption for those traveling to/from Marcham Church Of England Primary School which is less than 400m west of where the proposed road meets the A415. Part of the A415 Marcham Road may be shut or traffic may be limited to facilitate construction. With secondary schools within Abingdon it is expected that those who live in Marcham to travel via the A415 to school. Users may experience disruption (delays) from potential closures. Abingdon hospital lies east of the new road and potential disruption of this road may affect ease of access for medical facilities. Construction of the A415 to SESRO Road A may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). Mitigation minimising disruption to schools and hospitals is recommended.	Socio-Economic
CPC3	Minimise impacts on local community during operation associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during operation	Operation of the A415 to SESRO Road D does not directly affect community assets. The road itself when complete does result in the severance of multiple PRoWs. Although these PRoW are away from residential areas, they could link Drayton to Marcham and community assets in each area (schools). It is possible to mitigate this impact by maintaining crossings for the PRoW.	Socio-Economic
CPC4A	Are public rights of way (PRoW) disrupted or adversely affected?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Recreational resources / rights of way of local importance are disrupted or affected. The site is likely to affect public rights of way	Construction and operation of the A415 to SESRO Road D may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to mitigate this impact by maintaining a crossing for the PRoW.	Socio-Economic
CPC4B	Are there opportunities to create or improve linkages of Public Rights of Way (PRoW) and recreational routes?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Links to a recreational resource / right of way of local importance can be enhanced	Construction and operation of the A415 to SESRO Road D may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to not only mitigate this impact but to enhance the crossing and create a path between Drayton and Marcham that attracts use. The PRoW will also link with the old and proposed WB canal path therefore mitigation should consider this potential benefit or negative impact if not addressed.	Socio-Economic
CPC5	Maximise potential opportunity for recreational benefits	GIS analysis of PRoW, open spaces, cycle routes, canals, other forms of regional/nationally important receptors (eg National Cycle Routes), and community assets.	A	Option allows some additional recreational benefits to be realised	Construction and operation of the A415 to SESRO Road D may result in the severance of multiple PRoW. These paths could potentially link Marcham to Drayton and therefore cut off access to community assets in each area (schools). It is possible to not only mitigate this impact but to enhance the crossing and create a path between Drayton and Marcham that attracts use. The PRoW will also link with the old and proposed WB canal path therefore mitigation should consider this potential benefit or negative if not addressed.	Socio-Economic

CPC6	Support the realisation of socio economic incentives on SESRO, including employment, skills, tourism, sustainable travel, connecting people with nature and environmental education	GIS analysis of footprint, community assets, private residents, and businesses. Also awareness of overall project objectives is needed to conclude if the designs align with these.	A	Site supports some of the social-economic incentives of the overall scheme	Construction of the new road may affect operation/attendance of key socio-economic assets (schools in Marcham, Abingdon and Drayton). Abingdon hospital lies east of the new road and potential disruption of this road may affect access to medical facilities. Construction of the new road facilitates wider socio-economic goals of the project (employment, education etc.) but has some potential to create temporary disruption on roads and permanent disruption on PRoW if not mitigated correctly.	Socio-Economic
CPC7	Minimise overall SESRO Order Limits extent and land acquisition, without compromising SESRO needs and project benefits	Spatial comparison of land that would likely be included in the DCO Order Limits, including construction working areas, access and highways or PRoW interactions.	A	Requires minor additional Order Limits extent	Lies outside the area currently safeguarded in the VoWH Local Plan	Consenting
CPC8	Aim for consistency with published and (insofar as possible) emerging Local Plan land use allocations	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in existing and any emerging Local Plan documents and any Supplementary Planning Documents.	G	Low or no impact	Lies outside the SESRO safeguarded area in policies CP14 and CP14a. No other land use allocations conflicts with the VoWHDC Local Plan. No land use allocation conflicts with the consultation draft Joint Local Plan 2041. No land use allocation conflicts with the Oxfordshire County Council Minerals and Waste Local Plans. Not within the area of the South Oxfordshire District Council Local Plan.	Consenting
CPC9	Aim for consistency with any adopted Neighbourhood Plan policy applicable to the land area affected	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in any made Neighbourhood Plan.	G	Low or no impact	The road lies within both the made Drayton Neighbourhood Plan (adopted July 2015) and the made Wootton and St Helen Without Neighbourhood Plan (adopted December 2019). The Drayton NP outlines traffic as a problem in the Parish; when there are incidents on the A34, the B4017 that goes through the middle of Drayton is used as a relief road. Providing an alternative route to the A34 will help relieve this pressure. The Wootton and St Helen Without NP also recognises traffic to be a challenge and that transport infrastructure is considered to be inadequate. Traffic is also impacting the character of the Parish. However, as the road only enters the southern-most part of the designated Parish area, it is unlikely to have an impact (positive or negative) on traffic.	Consenting
CPC10	Avoid development of infrastructure within specifically designated areas or their setting, as applicable (e.g. Green Belt, AONB, Common Land, Open Space)	Spatial comparison with designated sites, their settings, and the nature of development works expected.	G	Does not require development of above-ground infrastructure within these designations or development likely to have more than a negligible effect on the setting (where applicable)	Not located within a specifically designated area, such as Green Belt, AONB, Common Land or Open Space.	Consenting
CPC11	Avoid encroachment on any safeguarded land in minerals and waste policy, unless the minerals can be beneficially utilised as a result	Spatial comparison of allocated sites and review of policy wording in existing and any emerging Waste and Minerals Local Plan documents.	G	Low or no impact	Not located in minerals safeguarding area or on a site allocated for minerals or waste uses.	Consenting
CPC12	Ability to integrate with existing nationally-significant infrastructure, statutory undertakers' major infrastructure, or any proposed future Nationally Significant Infrastructure Projects (NSIP) (such as that of National Highways, Environment Agency, Network Rail)	Review of NSIP projects on PINS's register; review of Network Rail and National Highways investment plans; spatial review of statutory undertakers' assets.	G	Low or no interaction with existing infrastructure or proposed Nationally Significant Infrastructure Project (NSIP)	No NSIPS currently registered. No known proposals from Network Rail or National Highways. The National Highways RIS3 Investment Plan will be published in 2024 which will detail the A34 improvement project. Road D would be likely to preclude the use of the road as a flood alleviation scheme (under consideration by the Environment Agency and as safeguarded under VoWH Local Plan policy CP14) because the amount of flood storage that could be provided would be substantially reduced. Existing high-voltage mains lines and electric lines cross road D in several locations. A water line also crosses road D.	Consenting

CPC13	Minimise the consenting complexity due to the need for additional consents and licenses that may be required outside the Development Consent Order (DCO), e.g. additional Flood Risk Activity Permit, Environmental Permit, abstraction/discharge Licence, European protected species licence, etc	Review of the nature of expected development works against the list of other consents and licenses developed at Gateway 2.	A	One or more additional consent/license required	Roads A, B, C and D cross over multiple PRoW and so a Temporary Traffic Regulation Order may be required, although this can potentially be included within the DCO application. A section 278 highways agreement, street works notice and highway works permit will also likely be necessary, although could also be included within the DCO. The location of Roads A, B, C and D within areas of Flood Zone and Abingdon Flood Alleviation Scheme may also require a Standard or Bespoke Flood Risk Activity Permit or a Flood Risk Activity Exemption permit from the Environment Agency, but these will be required anyway for other reservoir works. Likelihood of at least one European protected species relocation licence required.	Consenting
CPC14	Avoid or minimise the need for any consequential development consenting (i.e. displacement or alteration of other development)	Review of existing development within the likely land-take, its nature and scale.	G	No existing development requires planning permission to relocate or alter	Existing high-voltage, electric lines and water line will need to be diverted as pass through Road D. However, this can form part of the DCO associated development or potentially be delivered through statutory undertaker permitted development.	Consenting
CPC15	Minimise interfaces/reliance on external governing/third parties (e.g. Removing the canal removes a stakeholder, reducing interfaces and permissions required from Network Rail, National Highways, National Grid)	Review GIS layers for services against the options. Expert Judgement.	G	Interfaces with others kept to a minimum or removed	All options score similarly because each would have interactions. Option D has an interface potentially with Marcham Bypass (but less so than option C). Option D has the least amount of interface, hence green.	Consenting
CPC17	The option provides economic benefits by directing traffic through local town centres which will boost their footfall and potential for people to stop and utilise their local economy	Expert judgement	G	The routes for this option do not provide a bypass of local towns and villages. Therefore, this option may boost the local economy of these towns and villages as people may be more likely to stop and visit the local businesses here.	Access road to site only.	Transport Planning
CPC18	Influence the location and layout of development to maximise the use and value of existing and planned sustainable transport investment	Expert judgement	G	Option supports existing and planned public transport infrastructure between key destinations	Shortest access road route, minimising distance for bus, walking and cycling along the access road. The junction which provides access to the existing road network is nearer to Marcham than Abingdon and supports walking/cycling from there.	Transport Planning
CPC19	Maximise the benefits of travel for non-motorised users between key destinations	Expert judgement	G	Provides numerous routes with infrastructure that prioritises non-motorised users to encourage users to walk, cycle or use bridleways	Access road to site only. Shared use footways beside the road may encourage users to use non-motorised transport to get to the reservoir or other recreational facilities.	Transport Planning
Property & Land Acquisition						
PRP1	Minimise loss of sensitive properties, i.e. residential, commercial, green belt, common land, historical or community assets due to project delivery	Review Land allocation mapping on ArcGIS.	G	No permanent or temporary loss of sensitive properties	No loss of sensitive properties identified. Land is all agricultural.	Property & Land Acquisition
PRP2	Minimise loss of land allocated within the Local Plan for alternative higher value / social / cultural value uses, e.g, residential, historical or community assets due project delivery	Review Land allocation mapping on ArcGIS.	G	No permanent or temporary loss of allocated land for higher value or social value properties	Road option D, does not immediately impact on residential planning permission.	Property & Land Acquisition
PRP3	Minimise permanent loss of best and most versatile agricultural land (grades 1, 2 and 3)	Review of agricultural grading layer on ArcGIS, based on 2019 Provisional Agricultural Land Classification	A	Results in loss of any Grade 2 agricultural land or >50% Grade 3 agricultural land	Agricultural land approximate percentage: grade 3 = 71% grade 4 = 29%	Property & Land Acquisition
PRP4	Assessment of Land and Property asset costs and associated compensation due under the Compensation Code	Review of land use / designation on ArcGIS	G	Land acquisition costs likely to be relatively low.	Agricultural land values can range from £8,000 - 14,000 in the area. Landowners may be eligible for Severance claims depending on design and farm practices.	Property & Land Acquisition
PRP5	Assessment of Special Category Landowners (SCLs), utility infrastructure, national asset protection agencies and Crown bodies	Review of affected landowners	G	No SCL on identified option	Sensitive Landowner only: Earl of Plymouth estates.	Property & Land Acquisition
PRP6	Minimise disruptions of landowners access to their land required for temporary works	Review location in conjunction with existing road network	G	Landowners able to access their land during construction and operation phases	Landowners able to access their land during construction and operation phases.	Property & Land Acquisition

Appendix E East Hanney to Steventon Road A Criteria Workbook

East Hanney - Steventon Road A

Criteria code	Criteria Description	Method of Assessment	RAG	Description of RAG	Narrative	Sub-Theme
Constructability						
CON1	Safety - Risk of endangering construction workers or members of the public during construction e.g. water, ground, height, rail, road and utilities	Look at programme and list types of construction involved. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	A	Works can be constructed safely but enhanced control measures required	Option A requires 10 crossings, including 4 bridges and requires interventions for overhead HV cables. It therefore scores Amber as the works can be constructed safely but enhanced control measures are required.	Health and Safety
CON2A	Programme - Duration, longest /shortest, but also consider whether the longer duration has an impact on the overall scheme programme	Compare differences in the programmes which would materialise from different options. Consider earthworks seasons.	G	Unlikely to extend the duration of the relevant area of works (e.g. road, rail siding or intake/offtake construction) compared to the Gate 2 SESRO programme and unlikely to impact on overall SESRO Gate 2 programme.	Option A is assessed as scoring green as it has a length of 5.1km, requiring 90,500m3 of fill material. It most likely would not impact the overall programme.	Programme
CON2B	Programme - Opportunities for construction programme acceleration through efficiencies	Compare differences in the programmes which would materialise from different options.	A	The option has limited potential to introduce programme efficiencies and reduce the construction programme	It may be possible to gain temporary construction access from the existing Hanney Road to allow the construction to begin earlier in the programme.	Programme
CON2C	Programme - Dependencies i.e. proximity or physical relationships between elements of scope that introduce programme dependencies	Is the options on the critical path? Will it impact other critical activities?	A	Several major dependencies/ multiple minor dependencies	A significant programme dependency being on the construction of the access road from the A415 to provide access for construction. The Steventon to East Hanney Road will need to be constructed prior to the main excavation works in the borrow pit.	Programme
CON2D	Programme - Risk	Are there items in the construction which have a significant programme risk	G	Minor programme risk	Option A is assessed as being green as it has minor programme risk and avoids any additional utility diversions.	Programme
CON3A	Logistics - Space available for construction and materials storage	Determine space constraints using GIS and options layouts from option definition.	A	Limited / restricted space	The option scores amber as there is likely to be some space constraints between the existing railway embankment and the reservoir embankment especially when considering the space required for utility diversions.	Logistics
CON3B	Logistics - Suitable and efficient access for construction workers, deliveries and waste removal including minimisation of lengths of new roads for access during construction	Determine method of access using GIS and options layouts from option definition.	G	Adequate access is available, and only short length (relative) of road is required for construction	Access for construction of the Steventon to East Hanney Road diversion is assumed to be via the A415 to SESRO Access Road. This is considered adequate and so the option scores green.	Logistics
CON3C	Logistics - Import of materials or resources during construction	Use quantity estimates to assess different options.	G	Little or no import of materials required	The Steventon to East Hanney Road diversion requires the import of materials for the road surface (which is assumed to be achieved via the A415 to SESRO Access Road). The earthworks required for the road embankment are assumed to be sourced from the site.	Logistics
CON3E	Logistics - Vehicle movements	Use vehicle movement estimates to assess different options.	A	Construction likely to add vehicle movements.	Material used to build the embankment will be won from the main SESRO site, however material to form the road surface will be brought to the site via the A415 to SESRO Access Road potentially adding vehicle movements through the site, hence the amber score.	Logistics
CON4A	Construction Complexity - Temporary conditions/works requirements e.g. embankment slope stability and moisture outside of placement seasons.	Expert Judgement	G	Temporary Works requirements minimal and can be used in the permanent state and no extension to the programme	The diversion road would be constructed to be permanent from the offset.	Construction complexity
CON4B	Construction Complexity - Location conflict/opportunity with another engineering component of the scheme or other SRO/non-SRO schemes, e.g. Severn to Thames Transfer (STT), Thames to Southern Transfer (T2ST), TW Swindon and Oxfordshire supply zone transfer, Transfer to Farmoor Reservoir	Expert judgement and knowledge of surrounding schemes	G	Location / layout of option provides an opportunity to be developed along with another component of this scheme (or another scheme)	Option A is assessed as being green as there is an opportunity to divert overhead HV (required to be diverted for the reservoir itself) within the road.	Construction complexity
CON4C	Construction Complexity - Minimise the number and complexity of additional structures/assets required or modifications to the existing structures/assets in order to facilitate the option, e.g. bridges, culverts, crossings	Determine using GIS and options layouts from option definition.	A	Option requires a moderately complex (mitigation likely) and/or moderate number of additional structures and/or modification to existing structures.	Option A requires ~90,500m3 of fill, 10 crossings and 4 bridges. This is considered to be moderately complex and scores Amber.	Construction complexity
CON5A	3rd Party Impact - Potential to disrupt existing road network during enabling works and construction	Expert judgement	A	Disruption likely to be moderate	Option A requires materials for road construction to be delivered to site via the reservoir access road, which is likely to cause moderate disruption on the A415 given the average number of HGVs per day is approx. 20.	3rd Party Impact
CON7A	Ground - Terrain of site, and implications for the need for earthworks and engineered slopes	Use of lidar and civil 3D models to assess amount/location of earthworks required	G	Terrain is favourable to the design of assets and therefore reduces the amount of earthworks required	The route is along relatively flat ground to the north of the railway, hence Green	Construction complexity
CON7B	Ground - Risk of unexpected conditions	Use of expert judgement based on comparable areas	A	Moderate exposure to risk of unexpected ground conditions.	From initial investigations, the ground conditions for Option A may have moderate risks and so the options are considered to score amber against this criteria.	Construction complexity
CON7C	Ground - Impact of ground conditions on the complexity of design and construction	Use of expert judgement	G	Ground conditions are unlikely to increase the complexity of design and construction with likely only a minimal (if any) impact on cost or requirement for materials that are difficult to source	From initial investigations, the ground conditions are unlikely to increase the complexity of design for Option A and so score green.	Construction complexity
Operability						

OPS1A	Safety - Risk of endangering operational staff, visitors or members of the public during operation	Look at operational activities and public access. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	G	Works can be operated safely without enhanced control measures	Minimal risk of endangering operational staff, visitors or members of the public during operation, and so scores green	Health and Safety
OPS1B	Safety - Access and egress for operational staff, visitors, deliveries and waste removal during normal operations and emergencies	Tunnel silt issue to be considered by expert judgement	G	Access/egress can be provided	Access and Egress is not considered to be an issue and so scores green.	Health and Safety
OPS2A	Maintenance - Ease of maintenance	Expert judgement	G	Majority of maintenance activities could be undertaken during limited closure periods and / or with limited disruption	Maintenance is not considered to be an issue and so scores green.	Operational Complexity
OPS4A	Reliability - Footprint of the option within flood zones (as an indication of the potential for damage and the challenge of operation / maintenance during flood events)	Review GIS supported by expert judgement	A	Option is within the flood zone, however damage is not considered to be a significant risk	Option is partly within a flood zone, however damage is not considered to be a significant risk	Operational Resilience
OPS4B	Reliability - The option does not have a single point of failure but rather includes backup infrastructure so that it can remain in operation if the primary infrastructure is unavailable, e.g. siphons in addition to tunnel for emergency discharge or alternative road route to reservoir crest	Expert judgement	A	There is a single point of failure but mitigation measures can be introduced to allow for continued operation, which might be a delayed or reduced service	In a scenario where the Steventon to East Hanney Road Diversion is out of operation it is assumed that other east-west routes would be used (e.g. A417 or A415).	Operational Resilience
OPS5A	Adaptability - Space available for future expansion of social / recreation infrastructure	Expert judgement	A	Limited opportunity / space available for future expansion (however this expansion is unlikely to be required)	This option takes up an area of the main SESRO site which could be used for increased social / recreational infrastructure. However, it also provides an opportunity for bus routes to help provide improved access to recreational facilities.	Operational Resilience
OPS5B	Adaptability - Flexibility for future modifications e.g. increasing reservoir storage volume, rail station at wantage and grove, construction of Marcham Bypass	Expert judgement	G	Option includes a large degree of flexibility for future modifications	Option A creates a direct link between East Hanney and Steventon with suitable footway and cycle facilities for future increase in walking and cycling. The option also maintains the road link between the villages for public transport.	Operational Resilience
OPS8A	3rd Party Impact - Potential to disrupt existing road network during operation	Expert judgement	A	Disruption likely to be limited	Visitor traffic is to be encouraged to use the A415 to SESRO Access Road (by the presence of the main visitor car park). Operational traffic is to use the A415 to SESRO Access Road, and would only use the Steventon Road or Hanney Road "stubs" in an emergency situation. Therefore, it can be assumed that the junctions for the Steventon to East Hanney Road Diversion need to be sized according to standard traffic growth.	Transport Planning
OPS8C	3rd Party Impact - Option facilitates infrastructure for other modes of transport, including pedestrians, cyclists and other non-motorised users	Expert judgement. Review GIS for PRoW, cycle routes, etc.	G	Option provides segregated cycle facilities, a footway that is wider than 2m, and suitable crossing infrastructure is provided for pedestrians and cyclists. Additional Bridleways or improvements or maintenance provided to existing bridleway routes are also included	All options provide new pedestrian and cycling facilities, it would be possible to expand this to also facilitate horse riding if needed.	Transport Planning
OPS8D	3rd Party Impact - Congestion at the relevant junctions for all movements, and the effective use of the transport network through innovative solutions	Expert judgement	A	Option provides a partial solution to delivering roads that will be effectively able to deal with traffic upon completion. However, the junctions designed may be unable to cope with traffic flows in future years.	Initial modelling illustrates capacity at the highway junctions is acceptable. Roundabout junctions could be replaced by signal junctions if walking / cycling demand was identified as a key issue and there was a safety concern identified at later design stages.	Transport Planning
OPS8E	3rd Party Impact - Impact on journey time reliability	Expert judgement	A	Option is not expected to either increases or improve journey times for road users on the road network	Option A would lead to an increase in journey times for those travelling between Steventon and East Hanney. Options A also creates a new segregated walking / cycling link between Steventon and East Hanney.	Transport Planning
Relative Costs						
COS1	Capex cost of the option	Cost estimate calculation for each option.	G	CAPEX estimated to result in an increase of <1% of the CAPEX for the overall SESRO project compared to the lowest cost option	Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 1.2% of the total SESRO costs. Option A is the lowest cost option.	Cost
COS3	Opportunity for cost-sharing with other SROs, NSIPs and local non-SRO schemes/plans, e.g. STT, T2ST, SWOX/Farmoor, Abingdon flood storage	Cost estimate calculation for each option.	A	Limitied opportunities identified for cost saving.	No OCC schemes currently identified on this route	Cost
Carbon Costs						
CAR1	Carbon costs associated to the Capex of the option	Carbon estimate calculation for each option.	G	Emissions (tCO2e) estimated to result in an increase of <1% of the emissions (tCO2e) for the overall SESRO project compared to the lowest emissions (tCO2e) option	Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option A is the lowest carbon option.	Carbon

CAR3	Opportunity for mitigation e.g. smaller earthworks may lead to less carbon	Carbon estimate calculation for each option.	G	High likelihood and magnitude of mitigation opportunity.	Option A is a short route and requires less fill for its embankments.	Carbon
Environmental Performance						
ENV1A	Minimise impacts on Special Area of Conservation (SAC)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SAC's or potential SAC's within the boundary of the proposed S2EH Option A. The closest SAC to the road is Cothill Fen SAC located approximately 7.1Km to the north.	Biodiversity and Nature Conservation
ENV1B	Minimise impacts on Special Protection Area (SPA)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SPA's or potential SPA's within the boundary of the proposed S2EH Option A. The closest SPA to the road is Thames Basin Heaths SPA located 41Km to the south-east.	Biodiversity and Nature Conservation
ENV1C	Minimise impacts on Ramsar	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no Ramsar sites or potential Ramsar sites within the boundary of the proposed S2EH Option A. The closest Ramsar to the road is South-west London Waterbodies located 57Km to the south-east.	Biodiversity and Nature Conservation
ENV1D	Minimise impacts on Site of Special Scientific Interest	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SSSI's within the boundary of the S2EH Option A. The site is partially located within the Impact Risk Zone (IRZ) of one SSSI. The closest SSSI to the road is Barrow Farm Fen SSSI located 4.7Km to the north. Due to the distance the works are located away from the SSSI no impacts are predicted for the site.	Biodiversity and Nature Conservation
ENV1E	Minimise impacts on National Nature Reserve	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no NNR within the boundary of the proposed S2EH Option A. The closest NNR to the road is located 7Km to the north. Cothill NNR.	Biodiversity and Nature Conservation
ENV1F	Minimise impacts on Local Nature Reserve (LMN)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no LNR within the boundary of the proposed S2EH Option A. The closest LNR to the road is located 7Km to the south-east of the site. The site is called Mowbray Fields and is located near East Hagbourne.	Biodiversity and Nature Conservation
ENV2A	Minimise impacts on Ancient Woodland	Natural England Ancient Woodland Maps and Professional Judgement.	G	No ancient woodland impacted	Historic mapping indicates that there is no ancient woodland present on-site	Biodiversity and Nature Conservation
ENV2B	Minimise impacts on Ancient and Veteran Trees	Woodland Trust Ancient Tree Inventory map search and professional judgement	A	Development in close proximity with potential indirect impact to ancient or veteran trees	There are no ancient or veteran trees recorded by the Woodland Trusts Ancient Tree Inventory on or close to this option. However, survey may identify trees that could be classified as ancient or veteran. As such, this option scores amber on a precautionary basis pending survey.	Biodiversity and Nature Conservation
ENV2C	Minimise impacts on Protected Trees	Check against published TPO dataset.	G	No protected trees impacted	No protected trees would be impacted.	Landscape & Visual
ENV2D	Minimise impacts on vegetation (including trees, woodland, hedges and shrubs)	Check against baseline resources and based upon high level knowledge of site from previous site visits. Professional judgement.	A	Direct impact on vegetation within a moderate proportion of construction footprint, which is of high arboricultural/amenity value (e.g. A or B grade) or biodiversity habitat in good condition. OR Direct impact on vegetation within large proportion of construction footprint, which is of lower arboricultural/visual amenity value (e.g. C grade) or biodiversity habitat in poor condition.	Construction of the road will require the removal of vegetation belts at several field boundaries, including a limited section of a woodland belt. Woodland is assumed likely to include A or B grade trees.	Biodiversity and Nature Conservation and Landscape
ENV3	Minimise impacts on Local Wildlife Sites (LWS)	Professional Judgement and LWS Citation provided by TVERC.	G	No impacts to LWS	Road lies to the north of The Cuttings and Hutchin's Copse LWS. Works areas / compounds etc should be sited to ensure there is no damage or destruction to the LWS	Biodiversity and Nature Conservation
ENV4A	Minimise impacts on Scheduled monuments or activities which could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	Nearest scheduled monument is a settlement site 2.5km north-east of the route option.	Historic Environment
ENV4B	Minimise impacts on listed buildings or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	This route option would require the removal and re-siting of a Grade II listed milestone on the A338.	Historic Environment
ENV4C	Minimise impacts on Registered Parks and Garden or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The Albert Park RP&G lies 4.2km to the north-east of the option alignment in Abingdon.	Historic Environment
ENV4D	Minimise impacts on Registered Battlefields or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The 1643 Battle of Chalgrove Registered Battlefield lies over 19km to the east of the option alignment.	Historic Environment

ENV4E	Avoid impacts on World Heritage Sites or activities that could lead to a loss of significance, including setting	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest World Heritage Site (Blenheim Palace) lies 23km north of the option alignment.	Historic Environment
ENV4F	Minimise impacts on conservation areas which could result in loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	The East Hanney conservation area lies approximately 300m away from the option alignment and is the closest to the route option, with Steventon the next closest at just under 800m to the east of the option alignment.	Historic Environment
ENV5A	Minimise loss to non-designated built heritage	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Extensive loss of non-designated built heritage of low value within the permanent infrastructure zone and adverse changes to within a 500m area from the edges of the permanent infrastructure OR more limited effects on non-designated built heritage of medium value	The option alignment would affect a short section of the redundant historic Wiltshire-Berkshire Canal.	Historic Environment
ENV5B	Minimise loss to paleoenvironmental remains	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or damage to low value remains within the construction area and adverse changes to similar buried remains in a 1km area around the permanent infrastructure from temporary and permanent changes to local hydrogeological regimes OR more limited effects on remains of medium value	The option alignment would affect a number of watercourses where buried paleoenvironmental remains may be located. The extent and significance of these are not known.	Historic Environment
ENV5C	Minimise loss to non-designated historic landscapes	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or extensive changes to low value non-designated historic landscapes within the construction area and extensive changes to the setting of the same resource outside the permanent infrastructure OR more limited effects on non-designated historic landscapes of medium value	There are no non-designated historic landscapes along the route option alignment.	Historic Environment
ENV5D	Minimise loss of non-designated archaeological remains	Professional judgement, incorporating the use of the IEMA's Principles of Cultural Heritage Assessment in the UK and the Chartered Institute for Archaeologists standard and guidance document for desk based assessment	A	Permanent infrastructure and construction area will result in the loss and / permanent damage to non-designated buried and extant archaeological remains worthy of regional significance which can only be partially mitigated through preservation by record	This route option passes through a series of cropmark complexes in between Hanney Road and the railway line to the south. The cropmark complexes are present in fields S405, S408, S420 S414 and S413 as labelled by archaeological contractors who have carried out aerial investigation and mapping and geophysical survey in these zones. Collectively these complexes have been attributed a regional value given a worst case scenario. The historic route of the Wiltshire-Berkshire Canal is also likely to warrant a regional heritage value and a small portion of it will be severed by the route option	Historic Environment
ENV6A	Minimise loss of fluvial flood storage within Flood Zone 2 or 3	Measure using GIS	A	Site is within flood zone 2 and 3 but loss of storage is minor or mitigation is available	Option is not considered to have a significant impact on fluvial flood risk, 13,188m2 area of road is sited within flood zones but sufficient space has been provided for Replacement Floodplain Storage along the watercourse diversions.	Flood Risk
ENV6B	Minimise impacts of pluvial flood risk.	Expert judgement	G	No predicted impacts on pluvial flood risk	Option is not considered to have a significant impact on pluvial flood risk as it is a single carriageway. The options are considered to score similarly against this criteria.	Flood Risk
ENV6C	Minimise impacts of groundwater flood risk.	Checking existing national and local records	G	No predicted impacts on groundwater flood risk	Option is not considered to have a significant impact on groundwater flood risk. The options are considered to score similarly against this criteria.	Flood Risk
ENV7A	Minimise disturbance of potentially contaminated land	Checking existing national and local records	A	Disturbance of potentially contaminated land with one or more of the following properties: - Unlikely to have significant cost or program implications - Unlikely to cause significant harm to potential receptors - Can be easily mitigated and remediated	This option intersects Steventon Depot, a historical military depot as well as the infilled Wiltshire / Berkshire canal presenting potential sources of contamination which will be disturbed. Depending on the thickness of superficial deposits here road construction is unlikely to disturb the Kimmeridge Clay bedrock and potential associated bituminous material.	Land
ENV7B	Minimise disturbance of potentially contaminated land specifically in relation to authorised and historic landfills	Checking existing national and local records	G	Not within authorised and historic landfills or previous industrial sites or within 250m of authorised and historic landfills or previous industrial sites	There is no authorised or historical landfill within 250m of this option	Land
ENV8	Minimise disturbance of land with known potential for Unexploded Ordnance (UXO)	Checking existing national and local records	A	Disturbance of a low quantity of UXO which can be easily managed / remediated. Unlikely to have significant cost or program implications	A pre-desk study assessment from Zetica acquired for gate 2 identified various potential UXO risks across the SESRO area, therefore, recommend a detailed UXO survey of the area. The layout intersects Steventon Depot which has a military history and therefore UXO may be found around this area.	Land
ENV9A	Minimise loss of terrestrial priority habitats (use narrative to describe type and quantum)	Use of aerial imagery, MAGIC maps and Professional Judgement	A	Priority habitat directly impacted but mitigation feasible	Construction of the road will require the removal of Hedgerows which are listed as Priority habitats.	Biodiversity and Nature Conservation
ENV9B	Minimise loss of aquatic priority habitats (use narrative to describe type and quantum)	Professional judgement based on knowledge of Water Framework Directive.	A	Priority habitat directly impacted but mitigation feasible	Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the any WFD waterbody to reduce potential impacts.	Aquatic Environment

ENV10A	Reduce effects on North Wessex Downs Area of Outstanding Natural Beauty (AONB) and its setting	Professional judgement.	A	AONB and its setting likely to be affected. Effect is unlikely to be significant.	The introduction of traffic, highway infrastructure and lighting into the rural landscape north of the GWR Main Line would be within the context of existing infrastructure, including a depot, highway and solar farms to the north. This would interrupt the medium to large scale field pattern divided by hedgerows and woodland belts. These contribute positively to the local landscape character and setting of the North Wessex Downs AONB. Effect on landscape character and tranquillity of AONB potentially significant in the short term, but could be mitigated in the long term. Residual effects of the highway on the AONB would therefore be similar to the existing Steventon/Hanney Road which it would replace, except at night due to the presence of lighting.	Landscape & Visual
ENV10B	Reduce effects on local landscape character	Professional judgement.	R	Effect on local landscape character is likely to be significant.	The introduction of traffic, highway infrastructure and lighting into the rural landscape north of the GWR Main Line would be within the context of existing infrastructure, including a depot, highway and solar farms to the north. This would interrupt the medium to large scale field pattern divided by hedgerows and woodland belts, which contribute positively to the local landscape character. Therefore the local landscape character and levels of tranquillity (also affected by noise) would be eroded. Although mitigation planting could help to reduce the residual long term effect, it would potentially remain significant due to the introduction of new bridges and a wider road footprint compared with the existing Steventon/Hanney Road.	Landscape & Visual
ENV11A	Reduce effects on panoramic views from national trail, open access land and important viewpoints in AONB	Professional judgement.	A	Effect on panoramic views from national trail, open access land and important viewpoints in AONB unlikely to be significant.	Traffic and highway infrastructure would be visible in some panoramic views from The Ridgeway National Trail, but would be seen in context of existing infrastructure in the landscape north of the GWR Main Line. Effects on such panoramic views could be mitigated in the long term to ensure it would be similar to the existing Steventon/Hanney Road which it would replace.	Landscape & Visual
ENV11B	Reduce effects on sensitive local visual receptors	Professional judgement.	R	Effect on local views of sensitive visual receptors likely to be significant.	Traffic and highway infrastructure would be visible in local views from some PRoWs, direct views of some isolated residential properties and the southern edge of East Hanney and the western edge of Steventon. Effects on most views could be reduced in the long term, but some significant effects may remain, including effects at night due to the presence of lighting.	Landscape & Visual
ENV12	Minimise disturbance/encroachment into Air Quality Management Area (AQMA)	Based on an understanding of the scale and nature of activities, air quality management areas (AQMAs) were identified in close proximity to the proposed works.	G	Site is located further than 1km from AQMA OR no construction traffic must go through an AQMA	Marcham AQMA is approximately 4 km N of Road A at its closest point. The anticipated construction and operational activities would likely lead to a negligible change in air quality.	Air Quality
ENV13	Minimise disturbance/encroachment into Groundwater Source Protection Zone (SPZ)	Magic maps	G	Site is within Zone 3 or not within a SPZ	Site is not within an SPZ.	Aquatic Environment
ENV14A	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Cow Common Brook and Portobello Ditch' WFD waterbody (GB106039023360) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - The route has one crossing on the Cow Common Brook and Portobello Ditch WFD waterbody as well as surrounding tributaries. Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts. The route overlaps with the proposed Eastern Watercourse Diversion (required mitigation for BNG and WFD compliance) in an area that is already a narrow corridor. This area would need to be assessed further.	Aquatic Environment
ENV14B	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ock and tributaries (Land Brook confluence to Thames)' WFD waterbody (GB106039023430) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14C	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Thames (Evenlode to Thame)' WFD waterbody (GB106039030334) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14D	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Sandford Brook (source to Ock)' WFD waterbody (GB106039023410) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14E	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Childrey Brook and Norbrook at Common' WFD waterbody (GB106039023380) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - The route has one crossing on the Childrey Brook and Norbrook at Common Barn WFD waterbody as well as surrounding tributaries. Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line)(to reduce potential impacts.	Aquatic Environment

ENV14F	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ginge Brook and Mill Brook' WFD waterbody (GB106039023660) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14G	Option does not affect Water Framework Directive (WFD) Quality Elements within one of WFD waterbodies downstream of the River Thame to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives. These WFD waterbodies include: - Thames Wallingford to Caversham - WFD waterbody GB106039030331 - Thames (Reading to Cookham) - WFD waterbody GB106039023233 - Thames (Cookham to Egham) - WFD waterbody GB106039023231 - Thames (Egham to Teddington) - WFD waterbody GB106039023232	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV15A	Maximise potential for future environmental benefits (terrestrial), e.g. increase tree planting	Professional Judgement	G	Site allows substantial additional environmental benefits to be realised	Being a predominantly arable landscape there is plenty of opportunity for environmental enhancement through the planting of trees and creation of habitats with high distinctiveness. Also, opportunity for the creation of wetland areas including wet woodland and ponds.	Biodiversity and nature conservation
ENV15B	Maximise potential for future environmental benefits (aquatic), e.g. increase wetlands area	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Site allows substantial additional environmental benefits to be realised	Connectivity through the watercourse and associated wetlands is crucial. Thus any road crossings will need to consider this appropriately and mitigation provided.	Aquatic Environment
ENV16	Maximise flexibility in routing diverted watercourses so their habitats can be of sufficiently high quality to contribute to catchment Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Site allows some flexibility in routing watercourses / Good quality habitat options are available	Road crossings need to ensure sufficient light and connectivity through the structure. Preference is a clear span, bridge on all crossings of principal WFD waterbodies (blue line) but an appropriately sized box culvert is acceptable on other watercourses in the WFD catchment. Pipe crossings will be deemed to be unacceptable and should be avoided.	Aquatic Environment
ENV17	Minimise disturbance/encroachment into Local Geological Sites (LGS)	Checking existing national and local records	G	Site is within 250m of LGS	No LGS present	Biodiversity and nature conservation
ENV18A	Minimise impacts associated with Noise and Vibration as a consequence of the construction of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment. Red band distance is from works site/road to the SOAEL+5dB, and Amber distance is from SOAEL+5dB to the SOAEL. Road Construction: Red 60m, Amber 61-99m, Green 100m. Construction Traffic: Red 40m, Amber 41-184m, Green 185m. Road Const. (bridge construction): Red 75m, Amber 81-124m, Green 125m. (NOTE: No sensitive properties have been identified within 125m of potential piling works at road bridges and significant effects are not anticipated. Distances referenced in the assessment are those measured between the proposed roads and receptors). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis (with >700 extra receptors included, namely at Diversion Road C, which is outside of Gate 2 Study Area).	R	Significant effects likely which would be difficult to mitigate	The closest noise sensitive property is located approximately 30m from the Steventon to East Hanney Diversion Road Option A. Based on the indicative assessment, a total of two properties are predicted to be within the Red band during construction, though no properties are predicted to be within the Amber band.	Noise

ENV18B	Minimise impacts associated with Noise and Vibration as a consequence of the operation of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment (inc. bunding around sidings). Red band is from works site to the SOAEL+5dB distance, and Amber is from SOAEL+5dB distance to the SOAEL. Rail Sidings: Red 675m, Amber 676-1209m, Green 1210m. This is based on worst-case activity, Material Handling, which includes potential for works between 06:00 to 07:00 and was assessed using night-time noise assessment criteria at Gate 2 as a precautionary approach. The noise emission for the activity is based on G2 assumptions, with update made following review by Costain (JB 05Jun). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis.	R	Significant effects likely which would be difficult to mitigate	The closest noise sensitive properties are located approximately 30m from the Steventon to East Hanney Diversion Road Option A. Based on the indicative assessment, two properties are predicted to be within the Red band during operation, though no properties are predicted to be within the Amber band.	Noise
ENV19A	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the construction of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	There are between 10 - 100 high sensitivity receptors (i.e. dwellings) within 350 m of the Road A route with the closest being <50m away. Construction activities include the carriageway (rural two-lane carriageway approximately 5.1 km in length) with a potential cycle / footway, a roundabout junction south of East Hanney (thus reducing traffic impact), a total of 10 crossings in addition to a higher embankment prior to crossing the West Watercourse Diversion. It is considered that there are no dust-generating activities proposed that could not be managed using normal good practices to prevent significant effects at any off-site receptor. Given that relatively low numbers of plant and items of machinery would be used and the anticipated number of construction traffic, the potential effects would likely lead to a negligible change in air quality.	Air Quality
ENV19B	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the operation of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	Although traffic would be diverted away from E Hanney, it would still pass through Steventon. Therefore, Road A is considered the least preferred option. However, based on the 2021 Traffic Flow Data (see 405335-T4-02 Movement Strategy Report) and anticipated tourism, the likely annual average daily traffic (AADT) is such that the potential effects from vehicle emissions would likely lead to a negligible change in air quality at nearby receptors.	Air Quality
ENV20A	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the construction of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Construction activities would lead to noticeable changes to the visual amenity of the local community in the vicinity of East Hanney and Steventon, in part due to lighting during occasional night-time construction works.	Landscape & Visual
ENV20B	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the operation of the option	Professional judgement.	G	Barely perceptible changes to visual amenities, with no or little effect on local community	Traffic and highway infrastructure associated with the existing Steventon/Hanney Road would be moved further from East Hanney, but slightly closer to Steventon. Effect on day-time visual amenity could be mitigated in the long term with planting mitigation, while the effect of lighting at night likely to be barely perceptible in context of existing light pollution within Steventon and only noticeable in relation to a very limited part of East Hanney.	Landscape & Visual
ENV21A	Minimise impacts associated with solid discharge during construction.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road construction likely to be readily controlled using standard construction mitigation	Pollution
ENV21B	Minimise impacts associated with solid discharge during operation.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road operation likely to be readily controlled using standard mitigation	Pollution
Community and Planning Considerations						
CPC1	Distance to the nearest property that will stay during construction (metres)	GIS	R	Less than 250m from the nearest property	50m to the nearest property	Socio-Economic
CPC2	Minimise impacts on local community during construction associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during construction	Construction of the new road may cause closures or limited travel (disruption) on the A338 and Hanney Road. Residents living in East Hanney and West Hanney who want to access medical treatment located in Wantage may experience disruption with the most direct route being via the A388. PRoW severance has been identified near East Hanney, these are residential areas and likely to be used by the community as walking routes. They do not appear to link with community assets. The proposed road passes through a retail park/industrial estate, there are currently no community assets within this estate and this unit will be removed as part of the overall project.	Socio-Economic
CPC3	Minimise impacts on local community during operation associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	G	Community access/use of community assets is not disrupted during operation	Operation of Steventon Road A should lead to no community assets being disrupted. The operation of the new Steventon Road A potentially causes severance for multiple PRoWs, and with these paths near residential areas, individuals potentially use the PRoW to access green spaces. The PRoW are not linked to any specific community assets. It is possible that mitigation will maintain access for these PRoW and enhance use.	Socio-Economic

CPC4A	Are public rights of way (PRoW) disrupted or adversely affected?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Recreational resources / rights of way of local importance are disrupted or affected. The site is likely to affect public rights of way	The construction and operation of the new Steventon Road A potentially causes severance for multiple PRoWs, and with these paths near residential areas, individuals potentially use the PRoW to access green spaces. The PRoW are not linked to any specific community assets. It is possible that mitigation will maintain access for these PRoW and enhance use.	Socio-Economic
CPC4B	Are there opportunities to create or improve linkages of Public Rights of Way (PRoW) and recreational routes?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Links to a recreational resource / right of way of local importance can be enhanced	The construction and operation of the new Steventon Road A potentially causes severance for multiple PRoWs, and with these paths near residential areas, individuals potentially use the PRoW to access the green spaces. The PRoW are not linked to any specific community assets. It is possible that mitigation will maintain access for these PRoW and enhance use. The road potentially affects access and utility of the proposed restoration of the Wilts and Berkshire canal path.	Socio-Economic
CPC5	Maximise potential opportunity for recreational benefits	GIS analysis of PRoW, open spaces, cycle routes, canals, other forms of regional/nationally important receptors (eg National Cycle Routes), and community assets.	A	Option allows some additional recreational benefits to be realised	The road may hinder access to the reservoir and planned restoration of the Wilts and Berkshire canal path. If access is maintained or improved then this will allow additional recreational benefits.	Socio-Economic
CPC6	Support the realisation of socio-economic incentives on SESRO, including employment, skills, tourism, sustainable travel, connecting people with nature and environmental education	GIS analysis of footprint, community assets, private residents, and businesses. Also awareness of overall project objectives is needed to conclude if the designs align with these.	A	Site supports some of the social-economic incentives of the overall scheme	The road has minimal negative impacts on community assets and therefore minimal disruption during both construction and operation phases.	Socio-Economic
CPC7	Minimise overall SESRO Order Limits extent and land acquisition, without compromising SESRO needs and project benefits	Spatial comparison of land that would likely be included in the DCO Order Limits, including construction working areas, access and highways or PRoW interactions.	G	Requires minimum Order Limits extent	Road A, B1 and B2 all are fairly close to the reservoir footprint and are partially located within the area currently safeguarded in the VoWHDC Local Plan. The road and works area to construct it would be close to the RSMH1 option should that be chosen, minimising the Order Limits extent and land acquisition.	Consenting
CPC8	Aim for consistency with published and (insofar as possible) emerging Local Plan land use allocations	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in existing and any emerging Local Plan documents and any Supplementary Planning Documents.	G	Low or no impact	Lies within the SESRO safeguarded area (CP14 and CP14a). No land use allocation conflicts with VoWHDC Local Plan. No land use allocation conflicts with the consultation draft Joint Local Plan 2041. No land use allocation conflicts with the Oxfordshire County Council Minerals and Waste Local Plans. Not within the area of the South Oxfordshire District Council Local Plan.	Consenting
CPC9	Aim for consistency with any adopted Neighbourhood Plan policy applicable to the land area affected	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in any made Neighbourhood Plan.	G	Low or no impact	West part of road lies within the draft East Hanney Neighbourhood Plan, which has been submitted for examination. Traffic is also considered an issue in the NP, particularly on the A338. Access into and out of the village is becoming increasingly difficult - providing the road from East Hanney to Steventon to the south of the village (as opposed to in the centre of the village) may help to reduce some congestion. The east part lies within Steventon Neighbourhood Plan which is preparing for submission and a draft plan is not yet available. The middle section of the road goes through Ardington and Lockinge, although no plans are in preparation.	Consenting
CPC10	Avoid development of infrastructure within specifically designated areas or their setting, as applicable (e.g. Green Belt, AONB, Common Land, Open Space)	Spatial comparison with designated sites, their settings, and the nature of development works expected.	G	Does not require development of above-ground infrastructure within these designations or development likely to have more than a negligible effect on the setting (where applicable)	Not located within a specifically designated area, such as Green Belt, AONB, Common Land or Open Space.	Consenting
CPC11	Avoid encroachment on any safeguarded land in minerals and waste policy, unless the minerals can be beneficially utilised as a result	Spatial comparison of allocated sites and review of policy wording in existing and any emerging Waste and Minerals Local Plan documents.	G	Low or no impact	Not located in minerals safeguarding area or on a site allocated for minerals or waste uses.	Consenting
CPC12	Ability to integrate with existing nationally-significant infrastructure, statutory undertakers' major infrastructure, or any proposed future Nationally Significant Infrastructure Projects (NSIP) (such as that of National Highways, Environment Agency, Network Rail)	Review of NSIP projects on PINS's register; review of Network Rail and National Highways investment plans; spatial review of statutory undertakers' assets.	G	Low or no interaction with existing infrastructure or proposed Nationally Significant Infrastructure Project (NSIP)	No NSIPs currently registered. No known proposals from Network Rail or National Highways. The National Highways RIS3 Investment Plan will be published in 2024 which will detail the A34 improvement project. Potential to serve Grove Railway station should RSMH1 or RSMH4a/b be used to develop the station. Existing HV lines run parallel to Road A and cross the road at several points. Existing potable water runs along Hanney Road and so also crossed Road A. Electric and telecoms lines are also crossed multiple times by Road A.	Consenting
CPC13	Minimise the consenting complexity due to the need for additional consents and licenses that may be required outside the Development Consent Order (DCO), e.g. additional Flood Risk Activity Permit, Environmental Permit, abstraction/discharge Licence, European protected species licence, etc	Review of the nature of expected development works against the list of other consents and licenses developed at Gateway 2.	A	One or more additional consent/license required	Roads A, B1 and B2 cross over multiple PRoW and so a Temporary Traffic Regulation Order may be required, although this can potentially be included within the DCO application. A section 278 highways agreement, street works notice and highway works permit will also likely be necessary, although could also be included within the DCO. The location of Roads A, B1 and B2 within areas of Flood Zone may also require a Standard or Bespoke Flood Risk Activity Permit or a Flood Risk Activity Exemption permit from the Environment Agency, but these will be required anyway for other reservoir works.	Consenting
CPC14	Avoid or minimise the need for any consequential development consenting (i.e. displacement or alteration of other development)	Review of existing development within the likely land-take, its nature and scale.	A	Other existing development requires planning permission to relocate or alter	Passes through the existing freight yard and existing light industrial 'Steventon Storage' site. However, this site would also be affected by the likely reservoir footprint and embankment construction area. Existing HV mains, potable water, electric and telecoms lines would need to be diverted as pass through Road A. However, this can form part of the DCO associated development or potentially be delivered through statutory undertaker permitted development.	Consenting

CPC15	Minimise interfaces/reliance on external governing/third parties (e.g. Removing the canal removes a stakeholder, reducing interfaces and permissions required from Network Rail, National Highways, National Grid)	Review GIS layers for services against the options. Expert Judgement.	A	Several manageable interfaces with others	Stakeholders involved include: small local businesses, Network Rail, National Highways England, National Grid, local solar farm. Options A and B1 score better than B2 and C due to interactions with overhead lines and water.	Consenting
CPC17	The option provides economic benefits by directing traffic through local town centres which will boost their footfall and potential for people to stop and utilise their local economy	Expert judgement	G	The routes for this option do not provide a bypass of local towns and villages. Therefore, this option may boost the local economy of these towns and villages as people may be more likely to stop and visit the local businesses here.	Retains the East Hanney - Steventon connection, retaining the route through Steventon, but moving route to the south of East Hanney. Moves the road the least, for all the options.	Transport Planning
CPC18	Influence the location and layout of development to maximise the use and value of existing and planned sustainable transport investment	Expert judgement	G	Option supports existing and planned public transport infrastructure between key destinations	Keeps the east-west link for the existing bus route, enabling future expansion if required, and also enables bus access from the south.	Transport Planning
CPC19	Maximise the benefits of travel for non-motorised users between key destinations	Expert judgement	G	Provides numerous routes with infrastructure that prioritises non-motorised users to encourage users to walk, cycle or use bridleways	The road alignment will enable the provision of ped/cycle facilities in the form of a shared route. An equestrian path could also be provided if the need for one is identified.	Transport Planning
Property & Land Acquisition						
PRP1	Minimise loss of sensitive properties, i.e. residential, commercial, green belt, common land, historical or community assets due to project delivery	Review Land allocation mapping on ArcGIS.	A	Moderate or temporary loss of sensitive properties	Options A, B1 and B2 run through storage yard, Employment land will be affected, however, asset would have to be removed as part of the overall scheme. otherwise land is mostly agricultural land.	Property & Land Acquisition
PRP2	Minimise loss of land allocated within the Local Plan for alternative higher value / social / cultural value uses, e.g, residential, historical or community assets due project delivery	Review Land allocation mapping on ArcGIS.	G	No permanent or temporary loss of allocated land for higher value or social value properties	Road option A does not immediately impact on residential planning permission.	Property & Land Acquisition
PRP3	Minimise permanent loss of best and most versatile agricultural land (grades 1, 2 and 3)	Review of agricultural grading layer on ArcGIS, based on 2019 Provisional Agricultural Land Classification	A	Results in loss of any Grade 2 agricultural land or >50% Grade 3 agricultural land	Agricultural land approximate percentage: grade 3 = 76.5% grade 4 = 23.5%	Property & Land Acquisition
PRP4	Assessment of Land and Property asset costs and associated compensation due under the Compensation Code	Review of land use / designation on ArcGIS	A	Land acquisition costs likely to be relatively moderate.	Agricultural land values can range from £8,000 - 14,000 in the area. Landowners may be eligible for Severance claims depending on design and farm practices. Employment land can range from £250,000 - £500,000 plus the value of any fixed assets or constructions.	Property & Land Acquisition
PRP5	Assessment of Special Category Landowners (SCLs), utility infrastructure, national asset protection agencies and Crown bodies	Review of affected landowners	A	Nature and number of SCL is medium / low and may represent delivery risks	No SCLOs. But a statutory Landowner - Church commisioners for England.	Property & Land Acquisition
PRP6	Minimise disruptions of landowners access to their land required for temporary works	Review location in conjunction with existing road network	G	Landowners able to access their land during construction and operation phases	Landowners able to access their land during construction and operation phases.	Property & Land Acquisition

Appendix F East Hanney to Steventon Road B1 Criteria Workbook

East Hanney - Steventon Road B1

Criteria code	Criteria Description	Method of Assessment	RAG	Description of RAG	Narrative	Sub-Theme
Constructability						
CON1	Safety - Risk of endangering construction workers or members of the public during construction e.g. water, ground, height, rail, road and utilities	Look at programme and list types of construction involved. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	A	Works can be constructed safely but enhanced control measures required	Option B1 requires 11 crossings, including 5 bridges and requires interventions for overhead HV cables. It therefore scores Amber as the works can be constructed safely but enhanced control measures are required.	Health and Safety
CON2A	Programme - Duration, longest /shortest, but also consider whether the longer duration has an impact on the overall scheme programme	Compare differences in the programmes which would materialise from different options. Consider earthworks seasons.	A	Likely to extend the duration of the relevant area of works (e.g. road, rail siding or intake/offtake construction) compared to the Gate 2 SESRO programme but unlikely to impact on the critical path of the Gate 2 SESRO programme.	Option B1 is accessed as scoring Amber as it has a length of 6.4km. The option may extend the duration of the works.	Programme
CON2B	Programme - Opportunities for construction programme acceleration through efficiencies	Compare differences in the programmes which would materialise from different options.	A	The option has limited potential to introduce programme efficiencies and reduce the construction programme	Option B1 has utility diversions and so scores Amber. It may be possible to gain temporary construction access from the existing Hanney Road to allow the construction to begin earlier in the programme.	Programme
CON2C	Programme - Dependencies i.e. proximity or physical relationships between elements of scope that introduce programme dependencies	Is the options on the critical path? Will it impact other critical activities?	A	Several major dependencies/ multiple minor dependencies	A significant programme dependency being on the construction of the access road from the A415 to provide access for construction. The Steventon to East Hanney Road will need to be constructed prior to the main excavation works in the borrow pit.	Programme
CON2D	Programme - Risk	Are there items in the construction which have a significant programme risk	A	Moderate programme risk	Option B1 is likely to require diversion of overhead HV lines and a water main, which increases programme risk and therefore scores Amber	Programme
CON3A	Logistics - Space available for construction and materials storage	Determine space constraints using GIS and options layouts from option definition.	A	Limited / restricted space	The option scores amber as there is likely to be some space constraints between the existing railway embankment and the reservoir embankment especially when considering the space required for utility diversions.	Logistics
CON3B	Logistics - Suitable and efficient access for construction workers, deliveries and waste removal including minimisation of lengths of new roads for access during construction	Determine method of access using GIS and options layouts from option definition.	G	Adequate access is available, and only short length (relative) of road is required for construction	Access for construction of the Steventon to East Hanney Road diversion is assumed to be via the A415 to SESRO Access Road. This is considered adequate and so the option scores green.	Logistics
CON3C	Logistics - Import of materials or resources during construction	Use quantity estimates to assess different options.	G	Little or no import of materials required	The Steventon to East Hanney Road diversion requires the import of materials for the road surface (which is assumed to be achieved via the A415 to SESRO Access Road). The earthworks required for the road embankment are assumed to be sourced from the site.	Logistics
CON3E	Logistics - Vehicle movements	Use vehicle movement estimates to assess different options.	A	Construction likely to add vehicle movements.	Material used to build the embankment will be won from the main SESRO site, however material to form the road surface will be brought to the site via the A415 to SESRO Access Road potentially adding vehicle movements through the site, hence the amber score.	Logistics
CON4A	Construction Complexity - Temporary conditions/works requirements e.g. embankment slope stability and moisture outside of placement seasons.	Expert Judgement	G	Temporary Works requirements minimal and can be used in the permanent state and no extension to the programme	For option B1, the diversion road would be constructed to be permanent from the offset.	Construction complexity
CON4B	Construction Complexity - Location conflict/opportunity with another engineering component of the scheme or other SRO/non-SRO schemes, e.g. Severn to Thames Transfer (STT), Thames to Southern Transfer (T2ST), TW Swindon and Oxfordshire supply zone transfer, Transfer to Farmoor Reservoir	Expert judgement and knowledge of surrounding schemes	G	Location / layout of option provides an opportunity to be developed along with another component of this scheme (or another scheme)	For Option B1 is assessed as being green as there is an opportunity to divert overhead HV (required to be diverted for the reservoir itself) within the road.	Construction complexity
CON4C	Construction Complexity - Minimise the number and complexity of additional structures/assets required or modifications to the existing structures/assets in order to facilitate the option, e.g. bridges, culverts, crossings	Determine using GIS and options layouts from option definition.	A	Option requires a moderately complex (mitigation likely) and/or moderate number of additional structures and/or modification to existing structures.	Option B1 requires ~138,000m3 of fill material, 11 Crossings and 5 Bridges. This is considered to be moderately complex and scores Amber.	Construction complexity
CON5A	3rd Party Impact - Potential to disrupt existing road network during enabling works and construction	Expert judgement	A	Disruption likely to be moderate	Option B1 will require significant junctions to be constructed on Steventon Road.	3rd Party Impact
CON7A	Ground - Terrain of site, and implications for the need for earthworks and engineered slopes	Use of lidar and civil 3D models to assess amount/location of earthworks required	G	Terrain is favourable to the design of assets and therefore reduces the amount of earthworks required	The route is along relatively flat ground to the north of the railway, hence Green	Construction complexity
CON7B	Ground - Risk of unexpected conditions	Use of expert judgement based on comparable areas	A	Moderate exposure to risk of unexpected ground conditions.	From initial investigations, the ground conditions for Option B1 may have moderate risks and so the options are considered to score amber against this criteria.	Construction complexity
CON7C	Ground - Impact of ground conditions on the complexity of design and construction	Use of expert judgement	G	Ground conditions are unlikely to increase the complexity of design and construction with likely only a minimal (if any) impact on cost or requirement for materials that are difficult to source	From initial investigations, the ground conditions are unlikely to increase the complexity of design for Option B1 and so score green.	Construction complexity
Operability						

OPS1A	Safety - Risk of endangering operational staff, visitors or members of the public during operation	Look at operational activities and public access. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	G	Works can be operated safely without enhanced control measures	Minimal risk of endangering operational staff, visitors or members of the public during operation, and so scores green	Health and Safety
OPS1B	Safety - Access and egress for operational staff, visitors, deliveries and waste removal during normal operations and emergencies	Tunnel silt issue to be considered by expert judgement	G	Access/egress can be provided	Access and Egress is not considered to be an issue and so scores green.	Health and Safety
OPS2A	Maintenance - Ease of maintenance	Expert judgement	G	Majority of maintenance activities could be undertaken during limited closure periods and / or with limited disruption	Maintenance is not considered to be an issue and so scores green.	Operational Complexity
OPS4A	Reliability - Footprint of the option within flood zones (as an indication of the potential for damage and the challenge of operation / maintenance during flood events)	Review GIS supported by expert judgement	A	Option is within the flood zone, however damage is not considered to be a significant risk	Option is partly within a flood zone, however damage is not considered to be a significant risk	Operational Resilience
OPS4B	Reliability - The option does not have a single point of failure but rather includes backup infrastructure so that it can remain in operation if the primary infrastructure is unavailable, e.g. siphons in addition to tunnel for emergency discharge or alternative road route to reservoir crest	Expert judgement	A	There is a single point of failure but mitigation measures can be introduced to allow for continued operation, which might be a delayed or reduced service	In a scenario where the Steventon to East Hanney Road Diversion is out of operation it is assumed that other east-west routes would be used (e.g. A417 or A415).	Operational Resilience
OPS5A	Adaptability - Space available for future expansion of social / recreation infrastructure	Expert judgement	A	Limited opportunity / space available for future expansion (however this expansion is unlikely to be required)	This option takes up an area of the main SESRO site which could be used for increased social / recreational infrastructure. However, it also provides an opportunity for bus routes to help provide improved access to recreational facilities.	Operational Resilience
OPS5B	Adaptability - Flexibility for future modifications e.g. increasing reservoir storage volume, rail station at wantage and grove, construction of Marcham Bypass	Expert judgement	G	Option includes a large degree of flexibility for future modifications	Option B1 creates a direct link between East Hanney and Steventon with suitable footway and cycle facilities for future increase in walking and cycling. The option also maintains the road link between the villages for public transport.	Operational Resilience
OPS8A	3rd Party Impact - Potential to disrupt existing road network during operation	Expert judgement	A	Disruption likely to be limited	Visitor traffic is to be encouraged to use the A415 to SESRO Access Road (by the presence of the main visitor car park). Operational traffic is to use the A415 to SESRO Access Road, and would only use the Steventon Road or Hanney Road "stubs" in an emergency situation. Therefore, it can be assumed that the junctions for the Steventon to East Hanney Road Diversion need to be sized according to standard traffic growth.	Transport Planning
OPS8C	3rd Party Impact - Option facilitates infrastructure for other modes of transport, including pedestrians, cyclists and other non-motorised users	Expert judgement. Review GIS for PRoW, cycle routes, etc.	G	Option provides segregated cycle facilities, a footway that is wider than 2m, and suitable crossing infrastructure is provided for pedestrians and cyclists. Additional Bridleways or improvements or maintenance provided to existing bridleway routes are also included	All options provide new pedestrian and cycling facilities, it would be possible to expand this to also facilitate horse riding if needed.	Transport Planning
OPS8D	3rd Party Impact - Congestion at the relevant junctions for all movements, and the effective use of the transport network through innovative solutions	Expert judgement	A	Option provides a partial solution to delivering roads that will be effectively able to deal with traffic upon completion. However, the junctions designed may be unable to cope with traffic flows in future years.	Initial modelling illustrates capacity at the highway junctions is acceptable. Roundabout junctions could be replaced by signal junctions if walking / cycling demand was identified as a key issue and there was a safety concern identified at later design stages.	Transport Planning
OPS8E	3rd Party Impact - Impact on journey time reliability	Expert judgement	A	Option is not expected to either increases or improve journey times for road users on the road network	This option would lead to an increase in journey times for those travelling between Steventon and East Hanney. The bus route may need to be adjusted, unless the existing route out of Steventon was retained for buses, walking and cycling only, with other vehicles using the new road to the north of Steventon. This option creates a new segregated walking / cycling link between Steventon and East Hanney.	Transport Planning
Relative Costs						
COS1	Capex cost of the option	Cost estimate calculation for each option.	G	CAPEX estimated to result in an increase of <1% of the CAPEX for the overall SESRO project compared to the lowest cost option	Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 1.2% of the total SESRO costs. Option B1 results in a total project cost of 0.6% more than the lowest cost option.	Cost
COS3	Opportunity for cost-sharing with other SROs, NSIPs and local non-SRO schemes/plans, e.g. STT, T2ST, SWOX/Farmoor, Abingdon flood storage	Cost estimate calculation for each option.	A	Limitied opportunities identified for cost saving.	No OCC schemes currently identified on this route	Cost
Carbon Costs						
CAR1	Carbon costs associated to the Capex of the option	Carbon estimate calculation for each option.	G	Emissions (tCO2e) estimated to result in an increase of <1% of the emissions (tCO2e) for the overall SESRO project compared to the lowest emissions (tCO2e) option	Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option B1 results in a total project carbon of 0.3% more than the lowest carbon option.	Carbon
CAR3	Opportunity for mitigation e.g. smaller earthworks may lead to less carbon	Carbon estimate calculation for each option.	A	Limited likelihood and magnitude of mitigation opportunity.	Option B1 has an average route length.	Carbon
Environmental Performance						
ENV1A	Minimise impacts on Special Area of Conservation (SAC)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SAC's or potential SAC's within the boundary of the proposed S2EH Option B1. The closest SAC to the road is Cothill Fen SAC located approximately 7.1Km to the north.	Biodiversity and Nature Conservation

ENV1B	Minimise impacts on Special Protection Area (SPA)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SPA's or potential SPA's within the boundary of the proposed S2EH Option B1. The closest SPA to the road is Thames Basin Heaths SPA located 41Km to the south-east.	Biodiversity and Nature Conservation
ENV1C	Minimise impacts on Ramsar	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no Ramsar sites or potential Ramsar sites within the boundary of the proposed S2EH Option B1. The closest Ramsar to the road is South-west London Waterbodies located 57Km to the south-east.	Biodiversity and Nature Conservation
ENV1D	Minimise impacts on Site of Special Scientific Interest	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SSSI's within the boundary of the S2EH Option B1. The site is partially located within the Impact Risk Zone (IRZ) of one SSSI. The closest SSSI to the road is Barrow Farm Fen SSSI located 4.7Km to the north. Due to the distance the works are located away from the SSSI no impacts are predicted for the site.	Biodiversity and Nature Conservation
ENV1E	Minimise impacts on National Nature Reserve	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no NNR within the boundary of the proposed S2EH Option B1. The closest NNR to the road is located 7Km to the north. Cothill NNR.	Biodiversity and Nature Conservation
ENV1F	Minimise impacts on Local Nature Reserve (LMN)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no LNR within the boundary of the proposed S2EH Option B1. The closest LNR to the road is located 7Km to the south-east of the site. The site is called Mowbray Fields and is located near East Hagbourne.	Biodiversity and Nature Conservation
ENV2A	Minimise impacts on Ancient Woodland	Natural England Ancient Woodland Maps and Professional Judgement.	G	No ancient woodland impacted	Historic mapping indicates that there is no ancient woodland present on-site	Biodiversity and Nature Conservation
ENV2B	Minimise impacts on Ancient and Veteran Trees	Woodland Trust Ancient Tree Inventory map search and professional judgement	A	Development in close proximity with potential indirect impact to ancient or veteran trees	There are no ancient or veteran trees recorded by the Woodland Trusts Ancient Tree Inventory on or close to this option. However, survey may identify trees that could be classified as ancient or veteran. As such, this option scores amber on a precautionary basis pending survey.	Biodiversity and Nature Conservation
ENV2C	Minimise impacts on Protected Trees	Check against published TPO dataset.	G	No protected trees impacted	No protected trees would be impacted.	Landscape & Visual
ENV2D	Minimise impacts on vegetation (including trees, woodland, hedges and shrubs)	Check against baseline resources and based upon high level knowledge of site from previous site visits. Professional judgement.	A	Direct impact on vegetation within a moderate proportion of construction footprint, which is of high arboricultural/amenity value (e.g. A or B grade) or biodiversity habitat in good condition. OR Direct impact on vegetation within large proportion of construction footprint, which is of lower arboricultural/visual amenity value (e.g. C grade) or biodiversity habitat in poor condition.	Construction of the road will require the removal of vegetation belts at several field boundaries, including a limited section of a woodland belt. Woodland is assumed likely to include A or B grade trees.	Biodiversity and Nature Conservation and Landscape
ENV3	Minimise impacts on Local Wildlife Sites (LWS)	Professional Judgement and LWS Citation provided by TVERC.	G	No impacts to LWS	Road B1 is directly to the north of The Cuttings and Hutchin's Copse LWS. Works areas / compounds etc should be sited to ensure there is no damage or destruction to the LWS.	Biodiversity and Nature Conservation
ENV4A	Minimise impacts on Scheduled monuments or activities which could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest scheduled monument to the option alignment is the settlement site 1.25km to the north-east.	Historic Environment
ENV4B	Minimise impacts on listed buildings or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	A Grade II listed milestone on the A338 is likely to need to be removed and relocated for this option.	Historic Environment
ENV4C	Minimise impacts on Registered Parks and Garden or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The Albert Park RP&G is located 3km to the north-east within Abingdon.	Historic Environment
ENV4D	Minimise impacts on Registered Battlefields or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The 1643 Battle of Chalgrove Registered Battlefield lies 17.5km east of the option alignment.	Historic Environment
ENV4E	Avoid impacts on World Heritage Sites or activities that could lead to a loss of significance, including setting	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	Blenheim Palace WHS lies 22km north of the option alignment.	Historic Environment
ENV4F	Minimise impacts on conservation areas which could result in loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	Both the East Hanney and Steventon conservation areas lie within 500m of the option alignment.	Historic Environment
ENV5A	Minimise loss to non-designated built heritage	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Extensive loss of non-designated built heritage of low value within the permanent infrastructure zone and adverse changes to within a 500m area from the edges of the permanent infrastructure OR more limited effects on non-designated built heritage of medium value	Despite the loss of a small amount of non-designated built heritage such as an undated stone on the line of the historic Wiltshire-Berkshire Canal, the section affected would only be very minor on a feature that will be largely removed by the reservoir options.	Historic Environment

ENV5B	Minimise loss to paleoenvironmental remains	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or damage to low value remains within the construction area and adverse changes to similar buried remains in a 1km area around the permanent infrastructure from temporary and permanent changes to local hydrogeological regimes OR more limited effects on remains of medium value	The route passes over a number of different watercourses and paleoenvironmental remains will be present, but the extent and significance of these is unknown.	Historic Environment
ENV5C	Minimise loss to non-designated historic landscapes	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or extensive changes to low value non-designated historic landscapes within the construction area and extensive changes to the setting of the same resource outside the permanent infrastructure OR more limited effects on non-designated historic landscapes of medium value	There are no non-designated historic landscapes along the route option alignment.	Historic Environment
ENV5D	Minimise loss of non-designated archaeological remains	Professional judgement, incorporating the use of the IEMA's Principles of Cultural Heritage Assessment in the UK and the Chartered Institute for Archaeologists standard and guidance document for desk based assessment	A	Permanent infrastructure and construction area will result in the loss and / permanent damage to non-designated buried and extant archaeological remains worthy of regional significance which can only be partially mitigated through preservation by record	This route option passes through a series of cropmark complexes in between Hanney Road and the railway line to the south. The cropmark complexes are present in fields S405, S408, S420 S414 and S413 as labelled by archaeological contractors who have carried out aerial investigation and mapping and geophysical survey in these zones. Collectively these complexes have been attributed a regional value given a worst case scenario. The historic route of the Wiltshire-Berkshire Canal is also likely to warrant a regional heritage value and a small portion of it will be severed by the route option	Historic Environment
ENV6A	Minimise loss of fluvial flood storage within Flood Zone 2 or 3	Measure using GIS	A	Site is within flood zone 2 and 3 but loss of storage is minor or mitigation is available	Option is not considered to have a significant impact on fluvial flood risk, 19,468m2 area of road is sited within flood zones but sufficient space has been provided for Replacement Floodplain Storage along the watercourse diversions.	Flood Risk
ENV6B	Minimise impacts of pluvial flood risk.	Expert judgement	G	No predicted impacts on pluvial flood risk	Option is not considered to have a significant impact on pluvial flood risk as it is a single carriageway. The options are considered to score similarly against this criteria.	Flood Risk
ENV6C	Minimise impacts of groundwater flood risk.	Checking existing national and local records	G	No predicted impacts on groundwater flood risk	Option is not considered to have a significant impact on groundwater flood risk. The options are considered to score similarly against this criteria.	Flood Risk
ENV7A	Minimise disturbance of potentially contaminated land	Checking existing national and local records	A	Disturbance of potentially contaminated land with one or more of the following properties: - Unlikely to have significant cost or program implications - Unlikely to cause significant harm to potential receptors - Can be easily mitigated and remediated	This option intersects Steventon Depot, a historical military depot as well as the infilled Wiltshire / Berkshire canal presenting potential sources of contamination which will be disturbed. Depending on the thickness of superficial deposits here this layer is unlikely to disturb the Kimmeridge Clay bedrock and potential associated bituminous material.	Land
ENV7B	Minimise disturbance of potentially contaminated land specifically in relation to authorised and historic landfills	Checking existing national and local records	G	Not within authorised and historic landfills or previous industrial sites or within 250m of authorised and historic landfills or previous industrial sites	There is no authorised or historical landfill within 250m of this option	Land
ENV8	Minimise disturbance of land with known potential for Unexploded Ordnance (UXO)	Checking existing national and local records	A	Disturbance of a low quantity of UXO which can be easily managed / remediated. Unlikely to have significant cost or program implications	A pre-desk study assessment from Zetica acquired for gate 2 identified various potential UXO risks across the SESRO area, therefore, recommend a detailed UXO survey of the area. The layout intersects Steventon Depot which has a military history and therefore UXO may be found around this area.	Land
ENV9A	Minimise loss of terrestrial priority habitats (use narrative to describe type and quantum)	Use of aerial imagery, MAGIC maps and Professional Judgement	A	Priority habitat directly impacted but mitigation feasible	Construction of the road will require the removal of Hedgerows which are listed as Priority habitats.	Biodiversity and Nature Conservation
ENV9B	Minimise loss of aquatic priority habitats (use narrative to describe type and quantum)	Professional judgement based on knowledge of Water Framework Directive.	A	Priority habitat directly impacted but mitigation feasible	Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the any WFD waterbody to reduce potential impacts.	Aquatic Environment
ENV10A	Reduce effects on North Wessex Downs Area of Outstanding Natural Beauty (AONB) and its setting	Professional judgement.	A	AONB and its setting likely to be affected. Effect is unlikely to be significant.	The introduction of traffic, highway infrastructure and lighting into the rural landscape north of the GWR Main Line would be within the context of existing infrastructure, including a depot, substation, highway and solar farms to the north. This would interrupt the medium to large scale field pattern divided by hedgerows and woodland belts. These contribute positively to the local landscape character and setting of the North Wessex Downs AONB. Effect on landscape character and tranquillity of AONB potentially significant in the short term, but could be mitigated in the long term. Residual effects of the highway on the AONB would therefore only be slightly worse than the existing Steventon/Hanney Road which it would replace, due to the slightly extended alignment and the presence of lighting at night.	Landscape & Visual

ENV10B	Reduce effects on local landscape character	Professional judgement.	R	Effect on local landscape character is likely to be significant.	The introduction of traffic, highway infrastructure and lighting into the rural landscape north of the GWR Main Line would be within the context of existing infrastructure, including a depot, substation, highway and solar farms to the north. This would interrupt the medium to large scale field pattern divided by hedgerows and woodland belts, which contribute positively to the local landscape character. Therefore the local landscape character and levels of tranquillity (also affected by noise) would be eroded. Although mitigation planting could help to reduce the residual long term effect, it would potentially remain significant due to the introduction of new bridges, a wider road footprint and extended alignment compared with the existing Steventon/Hanney Road.	Landscape & Visual
ENV11A	Reduce effects on panoramic views from national trail, open access land and important viewpoints in AONB	Professional judgement.	A	Effect on panoramic views from national trail, open access land and important viewpoints in AONB unlikely to be significant.	Traffic and highway infrastructure would be visible in some panoramic views from The Ridgeway National Trail, but would be seen in context of existing infrastructure in the landscape north of the GWR Main Line. Effects on such panoramic views could be mitigated in the long term to ensure it would be similar to the existing Steventon/Hanney Road which it would replace.	Landscape & Visual
ENV11B	Reduce effects on sensitive local visual receptors	Professional judgement.	R	Effect on local views of sensitive visual receptors likely to be significant.	Traffic and highway infrastructure would be visible in local views from some PRoWs, direct views of some isolated residential properties and the southern edge of East Hanney and western and northern edges of Steventon. Effects on most views could be reduced in the long term, but some significant effects may remain, including effects at night due to the presence of lighting.	Landscape & Visual
ENV12	Minimise disturbance/encroachment into Air Quality Management Area (AQMA)	Based on an understanding of the scale and nature of activities, air quality management areas (AQMAs) were identified in close proximity to the proposed works.	G	Site is located further than 1km from AQMA OR no construction traffic must go through an AQMA	Marcham AQMA is approximately 3.6 km N of Road B1 at its closest point. The anticipated construction and operational activities would likely lead to a negligible change in air quality.	Air Quality
ENV13	Minimise disturbance/encroachment into Groundwater Source Protection Zone (SPZ)	Magic maps	G	Site is within Zone 3 or not within a SPZ	Site is not within an SPZ.	Aquatic Environment
ENV14A	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Cow Common Brook and Portobello Ditch' WFD waterbody (GB106039023360) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - The route has one crossing on the Cow Common Brook and Portobello Ditch WFD waterbody as well as surrounding tributaries. Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts. The route overlaps with the proposed Eastern Watercourse Diversion (required mitigation for BNG and WFD compliance) in an area that is already a narrow corridor. This area would need to be assessed further.	Aquatic Environment
ENV14B	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ock and tributaries (Land Brook confluence to Thames)' WFD waterbody (GB106039023430) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14C	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Thames (Evenlode to Thame)' WFD waterbody (GB106039030334) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14D	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Sandford Brook (source to Ock)' WFD waterbody (GB106039023410) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14E	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Childrey Brook and Norbrook at Common' WFD waterbody (GB106039023380) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - The route has one crossing on the Childrey Brook and Norbrook at Common Barn WFD waterbody as well as surrounding tributaries. Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14F	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ginge Brook and Mill Brook' WFD waterbody (GB106039023660) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment

ENV14G	Option does not affect Water Framework Directive (WFD) Quality Elements within one of WFD waterbodies downstream of the River Thame to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives. These WFD waterbodies include: - Thames Wallingford to Caversham - WFD waterbody GB106039030331 - Thames (Reading to Cookham) - WFD waterbody GB106039023233 - Thames (Cookham to Egham) - WFD waterbody GB106039023231 - Thames (Egham to Teddington) - WFD waterbody GB106039023232	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV15A	Maximise potential for future environmental benefits (terrestrial), e.g. increase tree planting	Professional Judgement	G	Site allows substantial additional environmental benefits to be realised	Being a predominantly arable landscape there is plenty of opportunity for environmental enhancement through the planting of trees and creation of habitats with high distinctiveness. Also, opportunity for the creation of wetland areas including wet woodland and ponds.	Biodiversity and nature conservation
ENV15B	Maximise potential for future environmental benefits (aquatic), e.g. increase wetlands area	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Site allows substantial additional environmental benefits to be realised	Connectivity through the watercourse and associated wetlands is crucial. Thus any road crossings will need to consider this appropriately and mitigation provided.	Aquatic Environment
ENV16	Maximise flexibility in routing diverted watercourses so their habitats can be of sufficiently high quality to contribute to catchment Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Site allows some flexibility in routing watercourses / Good quality habitat options are available	Road crossings need to ensure sufficient light and connectivity through the structure. Preference is a clear span, bridge on all crossings of principal WFD waterbodies (blue line) but an appropriately sized box culvert is acceptable on other watercourses in the WFD catchment. Pipe crossings will be deemed to be unacceptable and should be avoided.	Aquatic Environment
ENV17	Minimise disturbance/encroachment into Local Geological Sites (LGS)	Checking existing national and local records	G	Site is located more than 250m from LGS	No LGS present	Biodiversity and nature conservation
ENV18A	Minimise impacts associated with Noise and Vibration as a consequence of the construction of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment. Red band distance is from works site/road to the SOAEL+5dB, and Amber distance is from SOAEL+5dB to the SOAEL. Road Construction: Red 60m, Amber 61-99m, Green 100m. Construction Traffic: Red 40m, Amber 41-184m, Green 185m. Road Const. (bridge construction): Red 75m, Amber 81-124m, Green 125m. (NOTE: No sensitive properties have been identified within 125m of potential piling works at road bridges and significant effects are not anticipated. Distances referenced in the assessment are those measured between the proposed roads and receptors). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis (with >700 extra receptors included, namely at Diversion Road C, which is outside of Gate 2 Study Area).	R	Significant effects likely which would be difficult to mitigate	The closest noise sensitive property is located approximately 60m from Steventon to East Hanney Diversion Road Option B1, with three properties between ~70 to 85m from the option and a further two within 99m. Based on the indicative assessment, one property is predicted to be in the red band during construction, while a further five properties are predicted to be within the Amber band.	Noise
ENV18B	Minimise impacts associated with Noise and Vibration as a consequence of the operation of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment (inc. bunding around sidings). Red band is from works site to the SOAEL+5dB distance, and Amber is from SOAEL+5dB distance to the SOAEL. Rail Sidings: Red 675m, Amber 676-1209m, Green 1210m. This is based on worst-case activity, Material Handling, which includes potential for works between 06:00 to 07:00 and was assessed using night-time noise assessment criteria at Gate 2 as a precautionary approach. The noise emission for the activity is based on G2 assumptions, with update made following review by Costain (JB 05Jun). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis.	A	Potential significant effects but likely to be mitigated if they occur	The closest noise sensitive property is located approximately 60m from Steventon to East Hanney Diversion Road Option B1, with three properties between ~70 to 85m from the option. Based on the indicative assessment, a total of eight properties are predicted to be in the amber band as a result of operational road traffic noise.	Noise

ENV19A	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the construction of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	There are between 10 - 100 high sensitivity receptors (i.e. dwellings) within 350 m of the Road B1 route with the closest being approximately 50 m NW of the route. Construction activities include the carriageway (rural two-lane carriageway approximately 6.4 km in length) with a potential cycle / footway) and 11 crossings would be required. It is considered that there are no proposed dust-generating construction activities that could not be managed using normal good practices (IAQM construction dust guidance, 2016) to prevent significant effects at any off-site receptor. Given that relatively low numbers of plant and items of machinery would be used and the anticipated number of construction traffic, the potential effects would likely lead to a negligible change in air quality.	Air Quality
ENV19B	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the operation of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	Road B1 directs traffic away from Steventon and E Hanney and, based on the 2021 Traffic Flow Data (see 405335-T4-02 Movement Strategy Report) and anticipated tourism, the likely AADT is such that the potential effects from vehicle emissions would likely lead to a negligible change in air quality at nearby receptors.	Air Quality
ENV20A	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the construction of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Construction activities would lead to noticeable changes to the visual amenity of the local community in the vicinity of East Hanney and Steventon, in part due to lighting during occasional night-time construction works. (Effect on visual amenity in Steventon greater than Option A.)	Landscape & Visual
ENV20B	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the operation of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Traffic and highway infrastructure associated with the existing Steventon/Hanney Road would be moved further from East Hanney, but would affect the visual amenity of Steventon to a greater extent. Effects on day-time visual amenity could be reduced in the long term with planting mitigation, though a noticeable change on visual amenity in Steventon would likely remain. Effect of lighting at night likely to be barely perceptible in context of existing light pollution within Steventon and only noticeable in relation to a very limited part of East Hanney.	Landscape & Visual
ENV21A	Minimise impacts associated with solid discharge during construction.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road construction likely to be readily controlled using standard construction mitigation	Pollution
ENV21B	Minimise impacts associated with solid discharge during operation.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road operation likely to be readily controlled using standard mitigation	Pollution
Community and Planning Considerations						
CPC1	Distance to the nearest property that will stay during construction (metres)	GIS	R	Less than 250m from the nearest property	50m to the nearest property	Socio-Economic
CPC2	Minimise impacts on local community during construction associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during construction	Construction of the new road may cause closures or limited travel (disruption) on the A338 and Hanney Road. Residents living in East Hanney and West Hanney who want to access medical treatment located in Wantage may experience disruption with the most direct route being through the A388. PRoW severance has been identified near East Hanney, these are residential areas and likely to be used by the community as walking routes. They do not appear to link with community assets. The proposed road passes through the retail park/industrial estate, there are currently no community assets within this estate and this unit will be addressed as part of the overall project.	Socio-Economic
CPC3	Minimise impacts on local community during operation associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	G	Community access/use of community assets is not disrupted during operation	Operation of the Steventon Road B should lead to no community assets being disrupted. The operation of the new Steventon Road B1 potentially causes severance for multiple PRoWs, and with these paths near residential areas, individuals potentially use the PRoW to access the green spaces. The PRoW are not linked to any specific community assets. It is possible that mitigation will maintain access for these PRoW and enhance use.	Socio-Economic
CPC4A	Are public rights of way (PRoW) disrupted or adversely affected?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Recreational resources / rights of way of local importance are disrupted or affected. The site is likely to affect public rights of way	The construction and operation of the new Steventon Road B1 potentially causes severance for multiple PRoWs, and with these paths near residential areas, individuals potentially use the PRoW to access the green spaces. The PRoW are not linked to any specific community assets. It is possible that mitigation will maintain access for these PRoW and enhance use.	Socio-Economic

CPC4B	Are there opportunities to create or improve linkages of Public Rights of Way (PRoW) and recreational routes?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Links to a recreational resource / right of way of local importance can be enhanced	The construction and operation of the new Steventon Road B1 potentially causes severance for multiple PRoWs, and with these paths near residential areas, individuals potentially use the PRoW to access the green spaces. The PRoW are not linked to any specific community assets. It is possible that mitigation will maintain access for these PRoW and enhance use. The road potentially affects access and utility of the proposed restoration of the Wilts and Berkshire canal path.	Socio-Economic
CPC5	Maximise potential opportunity for recreational benefits	GIS analysis of PRoW, open spaces, cycle routes, canals, other forms of regional/nationally important receptors (eg National Cycle Routes), and community assets.	A	Option allows some additional recreational benefits to be realised	The road may hinder access to the reservoir and planned restoration of the Wilts and Berkshire canal path. If access is maintained or improved then this will allow additional recreational benefits.	Socio-Economic
CPC6	Support the realisation of socio-economic incentives on SESRO, including employment, skills, tourism, sustainable travel, connecting people with nature and environmental education	GIS analysis of footprint, community assets, private residents, and businesses. Also awareness of overall project objectives is needed to conclude if the designs align with these.	A	Site supports some of the social-economic incentives of the overall scheme	The road has minimal negative impacts on community assets and therefore minimal disruption during both construction and operation phases.	Socio-Economic
CPC7	Minimise overall SESRO Order Limits extent and land acquisition, without compromising SESRO needs and project benefits	Spatial comparison of land that would likely be included in the DCO Order Limits, including construction working areas, access and highways or PRoW interactions.	G	Requires minimum Order Limits extent	Roads A, B1 and B2 all are fairly close to the reservoir footprint and are partially located within the area currently safeguarded in the VoWHDC Local Plan. The road and works area to construct it would be close to the RSMH1 option should that be chosen, minimising the Order Limits extent and land acquisition.	Consenting
CPC8	Aim for consistency with published and (insofar as possible) emerging Local Plan land use allocations	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in existing and any emerging Local Plan documents and any Supplementary Planning Documents.	G	Low or no impact	Lies within the SESRO safeguarded area (CP14 and CP14a). No land use allocation conflicts with VoWHDC Local Plan. Enters the Didcot Garden Town area of influence of the consultation draft Joint Local Plan 2041. No land use allocation conflicts with the Oxfordshire County Council Minerals and Waste Local Plans. Not within the area of the South Oxfordshire District Council Local Plan.	Consenting
CPC9	Aim for consistency with any adopted Neighbourhood Plan policy applicable to the land area affected	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in any made Neighbourhood Plan.	G	Low or no impact	West part of road lies within the draft East Hanney Neighbourhood Plan, which has been submitted for examination. Traffic is also considered an issue in the NP, particularly on the A338. Access into and out of the village is becoming increasingly difficult - providing the road from East Hanney to Steventon to the south of the village (as opposed to in the centre of the village) may help to reduce some congestion. The east part lies within Steventon Neighbourhood Plan which is preparing for submission and a draft plan is not yet available. The middle section of the road goes through Ardington and Lockinge, although no plans are in preparation.	Consenting
CPC10	Avoid development of infrastructure within specifically designated areas or their setting, as applicable (e.g. Green Belt, AONB, Common Land, Open Space)	Spatial comparison with designated sites, their settings, and the nature of development works expected.	G	Does not require development of above-ground infrastructure within these designations or development likely to have more than a negligible effect on the setting (where applicable)	Not located within a specifically designated area, such as Green Belt, AONB, Common Land or Open Space.	Consenting
CPC11	Avoid encroachment on any safeguarded land in minerals and waste policy, unless the minerals can be beneficially utilised as a result	Spatial comparison of allocated sites and review of policy wording in existing and any emerging Waste and Minerals Local Plan documents.	G	Low or no impact	Not located in minerals safeguarding area or on a site allocated for minerals or waste uses.	Consenting
CPC12	Ability to integrate with existing nationally-significant infrastructure, statutory undertakers' major infrastructure, or any proposed future Nationally Significant Infrastructure Projects (NSIP) (such as that of National Highways, Environment Agency, Network Rail)	Review of NSIP projects on PINS's register; review of Network Rail and National Highways investment plans; spatial review of statutory undertakers' assets.	G	Low or no interaction with existing infrastructure or proposed Nationally Significant Infrastructure Project (NSIP)	No NSIPs currently registered. No known proposals from Network Rail or National Highways. The National Highways RIS3 Investment Plan will be published in 2024 which will detail the A34 improvement project. Potential to serve Grove Railway station should RSMH1 or RSMH4a/b be used to develop the station. Existing gas, HV mains, potable water, electric lines and telecoms lines cross Road B1.	Consenting
CPC13	Minimise the consenting complexity due to the need for additional consents and licenses that may be required outside the Development Consent Order (DCO), e.g. additional Flood Risk Activity Permit, Environmental Permit, abstraction/discharge Licence, European protected species licence, etc	Review of the nature of expected development works against the list of other consents and licenses developed at Gateway 2.	A	One or more additional consent/license required	Roads A, B1 and B2 cross over multiple PRoW and so a Temporary Traffic Regulation Order may be required, although this can potentially be included within the DCO application. A section 278 highways agreement, street works notice and highway works permit will also likely be necessary, although could also be included within the DCO. The location of Roads A, B1 and B2 within areas of Flood Zone may also require a Standard or Bespoke Flood Risk Activity Permit or a Flood Risk Activity Exemption permit from the Environment Agency, but these will be required anyway for other reservoir works.	Consenting
CPC14	Avoid or minimise the need for any consequential development consenting (i.e. displacement or alteration of other development)	Review of existing development within the likely land-take, its nature and scale.	A	Other existing development requires planning permission to relocate or alter	Passes through the existing freight yard and existing light industrial 'Steventon Storage' site. However, this site would also be affected by the likely reservoir footprint and embankment construction area. Existing gas, HV mains, potable water, electric and telecoms lines would need to be diverted as pass through Road B1. However, this can form part of the DCO associated development or potentially be delivered through statutory undertaker permitted development.	Consenting

CPC15	Minimise interfaces/reliance on external governing/third parties (e.g. Removing the canal removes a stakeholder, reducing interfaces and permissions required from Network Rail, National Highways, National Grid)	Review GIS layers for services against the options. Expert Judgement.	A	Several manageable interfaces with others	Stakeholders involved include: small local businesses, Network Rail, National Highways England, National Grid, local solar farm. Options A and B1 score better than B2 and C due to interactions with overhead lines and water.	Consenting
CPC17	The option provides economic benefits by directing traffic through local town centres which will boost their footfall and potential for people to stop and utilise their local economy	Expert judgement	A	The routes for this option provide a bypass to some of the local towns, which means some of the visitors may be encouraged to shop in only some of these towns and only some towns may experience boosts to their local economy	Moves the route north of Steventon and to the south of East Hanney.	Transport Planning
CPC18	Influence the location and layout of development to maximise the use and value of existing and planned sustainable transport investment	Expert judgement	A	Option partially supports existing and planned public transport infrastructure between key destinations	Makes the east-west movement longer for vehicles (except buses, as well as walking and cycling) and requires a specific facility to turn buses around in Steventon. Hanney Road in Steventon will provide access for buses as well as for pedestrians and cyclists.	Transport Planning
CPC19	Maximise the benefits of travel for non-motorised users between key destinations	Expert judgement	G	Provides numerous routes with infrastructure that prioritises non-motorised users to encourage users to walk, cycle or use bridleways	The road alignment will enable the provision of ped/cycle facilities in the form of a shared route. An equestrian path could also be provided if the need for one is identified.	Transport Planning
Property & Land Acquisition						
PRP1	Minimise loss of sensitive properties, i.e. residential, commercial, green belt, common land, historical or community assets due to project delivery	Review Land allocation mapping on ArcGIS.	A	Moderate or temporary loss of sensitive properties	Options A, B1 and B2 run through storage yard, Employment land will be affected, however, asset would have to be removed as part of the overall scheme. otherwise land is mostly agricultural land.	Property & Land Acquisition
PRP2	Minimise loss of land allocated within the Local Plan for alternative higher value / social / cultural value uses, e.g, residential, historical or community assets due project delivery	Review Land allocation mapping on ArcGIS.	G	No permanent or temporary loss of allocated land for higher value or social value properties	Road option B1 does not immediately impact on residential planning permission.	Property & Land Acquisition
PRP3	Minimise permanent loss of best and most versatile agricultural land (grades 1, 2 and 3)	Review of agricultural grading layer on ArcGIS, based on 2019 Provisional Agricultural Land Classification	A	Results in loss of any Grade 2 agricultural land or >50% Grade 3 agricultural land	Agricultural land approximate percentage: grade 2 = 6% grade 3 = 75% grade 4 = 19%	Property & Land Acquisition
PRP4	Assessment of Land and Property asset costs and associated compensation due under the Compensation Code	Review of land use / designation on ArcGIS	A	Land acquisition costs likely to be relatively moderate.	Agricultural land values can range from £8,000 - 14,000 in the area. Landowners may be eligible for Severance claims depending on design and farm practices. Employment land can range from £250,000 - £500,000 plus the value of any fixed assets or constructions.	Property & Land Acquisition
PRP5	Assessment of Special Category Landowners (SCLs), utility infrastructure, national asset protection agencies and Crown bodies	Review of affected landowners	A	Nature and number of SCL is medium / low and may represent delivery risks	No SCLOs. But a statutory Landowner - Church commisioners for England.	Property & Land Acquisition
PRP6	Minimise disruptions of landowners access to their land required for temporary works	Review location in conjunction with existing road network	G	Landowners able to access their land during construction and operation phases	Landowners able to access their land during construction and operation phases.	Property & Land Acquisition

Appendix G East Hanney to Steventon Road B2 Criteria Workbook

East Hanney - Steventon Road B2

Criteria code	Criteria Description	Method of Assessment	RAG	Description of RAG	Narrative	Sub-Theme
Constructability						
CON1	Safety - Risk of endangering construction workers or members of the public during construction e.g. water, ground, height, rail, road and utilities	Look at programme and list types of construction involved. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	A	Works can be constructed safely but enhanced control measures required	Option B2 requires 11 crossings, including 5 bridges and requires interventions for overhead HV cables. It therefore scores Amber as the works can be constructed safely but enhanced control measures are required.	Health and Safety
CON2A	Programme - Duration, longest /shortest, but also consider whether the longer duration has an impact on the overall scheme programme	Compare differences in the programmes which would materialise from different options. Consider earthworks seasons.	A	Likely to extend the duration of the relevant area of works (e.g. road, rail siding or intake/offtake construction) compared to the Gate 2 SESRO programme but unlikely to impact on the critical path of the Gate 2 SESRO programme.	Option B2 is accessed as scoring Amber as it has a length of 6.2km. The option may extend the duration of the works.	Programme
CON2B	Programme - Opportunities for construction programme acceleration through efficiencies	Compare differences in the programmes which would materialise from different options.	A	The option has limited potential to introduce programme efficiencies and reduce the construction programme	Option B2 has utility diversions and so scores Amber. It may be possible to gain temporary construction access from the existing Hanney Road to allow the construction to begin earlier in the programme.	Programme
CON2C	Programme - Dependencies i.e. proximity or physical relationships between elements of scope that introduce programme dependencies	Is the options on the critical path? Will it impact other critical activities?	A	Several major dependencies/ multiple minor dependencies	A significant programme dependency being on the construction of the access road from the A415 to provide access for construction. The Steventon to East Hanney Road will need to be constructed prior to the main excavation works in the borrow pit.	Programme
CON2D	Programme - Risk	Are there items in the construction which have a significant programme risk	A	Moderate programme risk	Option B2 is likely to require diversion of overhead HV lines and a water main, which increases programme risk and therefore scores Amber.	Programme
CON3A	Logistics - Space available for construction and materials storage	Determine space constraints using GIS and options layouts from option definition.	A	Limited / restricted space	The option scores amber as there is likely to be some space constraints between the existing railway embankment and the reservoir embankment especially when considering the space required for utility diversions.	Logistics
CON3B	Logistics - Suitable and efficient access for construction workers, deliveries and waste removal including minimisation of lengths of new roads for access during construction	Determine method of access using GIS and options layouts from option definition.	G	Adequate access is available, and only short length (relative) of road is required for construction	Access for construction of the Steventon to East Hanney Road diversion is assumed to be via the A415 to SESRO Access Road. This is considered adequate and so the option scores green.	Logistics
CON3C	Logistics - Import of materials or resources during construction	Use quantity estimates to assess different options.	G	Little or no import of materials required	The Steventon to East Hanney Road diversion requires the import of materials for the road surface (which is assumed to be achieved via the A415 to SESRO Access Road). The earthworks required for the road embankment are assumed to be sourced from the site.	Logistics
CON3E	Logistics - Vehicle movements	Use vehicle movement estimates to assess different options.	A	Construction likely to add vehicle movements.	Material used to build the embankment will be won from the main SESRO site, however material to form the road surface will be brought to the site via the A415 to SESRO Access Road potentially adding vehicle movements through the site, hence the amber score.	Logistics
CON4A	Construction Complexity - Temporary conditions/works requirements e.g. embankment slope stability and moisture outside of placement seasons.	Expert Judgement	G	Temporary Works requirements minimal and can be used in the permanent state and no extension to the programme	For option B2 the diversion road would be constructed to be permanent from the offset.	Construction complexity
CON4B	Construction Complexity - Location conflict/opportunity with another engineering component of the scheme or other SRO/non-SRO schemes, e.g. Severn to Thames Transfer (STT), Thames to Southern Transfer (T2ST), TW Swindon and Oxfordshire supply zone transfer, Transfer to Farmoor Reservoir	Expert judgement and knowledge of surrounding schemes	G	Location / layout of option provides an opportunity to be developed along with another component of this scheme (or another scheme)	Option B2 is assessed as being green as there is an opportunity to divert overhead HV (required to be diverted for the reservoir itself) within the road.	Construction complexity
CON4C	Construction Complexity - Minimise the number and complexity of additional structures/assets required or modifications to the existing structures/assets in order to facilitate the option, e.g. bridges, culverts, crossings	Determine using GIS and options layouts from option definition.	A	Option requires a moderately complex (mitigation likely) and/or moderate number of additional structures and/or modification to existing structures.	Option B2 requires ~111,948m3 of fill material, 11 Crossings and 5 Bridges. This is considered to be moderately complex and scores Amber.	Construction complexity
CON5A	3rd Party Impact - Potential to disrupt existing road network during enabling works and construction	Expert judgement	A	Disruption likely to be moderate	Option B2 will require significant junctions to be constructed on Steventon Road.	3rd Party Impact
CON7A	Ground - Terrain of site, and implications for the need for earthworks and engineered slopes	Use of lidar and civil 3D models to assess amount/location of earthworks required	G	Terrain is favourable to the design of assets and therefore reduces the amount of earthworks required	The route is along relatively flat ground to the north of the railway, hence Green	Construction complexity
CON7B	Ground - Risk of unexpected conditions	Use of expert judgement based on comparable areas	A	Moderate exposure to risk of unexpected ground conditions.	From initial investigations, the ground conditions for Option B2 may have moderate risks and so the options are considered to score amber against this criteria.	Construction complexity
CON7C	Ground - Impact of ground conditions on the complexity of design and construction	Use of expert judgement	G	Ground conditions are unlikely to increase the complexity of design and construction with likely only a minimal (if any) impact on cost or requirement for materials that are difficult to source	From initial investigations, the ground conditions are unlikely to increase the complexity of design for Option B2 and so scores green.	Construction complexity
Operability						
OPS1A	Safety - Risk of endangering operational staff, visitors or members of the public during operation	Look at operational activities and public access. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	G	Works can be operated safely without enhanced control measures	Minimal risk of endangering operational staff, visitors or members of the public during operation, and so scores green	Health and Safety
OPS1B	Safety - Access and egress for operational staff, visitors, deliveries and waste removal during normal operations and emergencies	Tunnel silt issue to be considered by expert judgement	G	Access/egress can be provided	Access and Egress is not considered to be an issue and so scores green.	Health and Safety

OPS2A	Maintenance - Ease of maintenance	Expert judgement	G	Majority of maintenance activities could be undertaken during limited closure periods and / or with limited disruption	Maintenance is not considered to be an issue and so scores green.	Operational Complexity
OPS4A	Reliability - Footprint of the option within flood zones (as an indication of the potential for damage and the challenge of operation / maintenance during flood events)	Review GIS supported by expert judgement	A	Option is within the flood zone, however damage is not considered to be a significant risk	Option is partly within a flood zone, however damage is not considered to be a significant risk	Operational Resilience
OPS4B	Reliability - The option does not have a single point of failure but rather includes backup infrastructure so that it can remain in operation if the primary infrastructure is unavailable, e.g. siphons in addition to tunnel for emergency discharge or alternative road route to reservoir crest	Expert judgement	A	There is a single point of failure but mitigation measures can be introduced to allow for continued operation, which might be a delayed or reduced service	In a scenario where the Steventon to East Hanney Road Diversion is out of operation it is assumed that other east-west routes would be used (e.g. A417 or A415).	Operational Resilience
OPS5A	Adaptability - Space available for future expansion of social / recreation infrastructure	Expert judgement	A	Limited opportunity / space available for future expansion (however this expansion is unlikely to be required)	This option takes up an area of the main SESRO site which could be used for increased social / recreational infrastructure. However, it also provides an opportunity for bus routes to help provide improved access to recreational facilities.	Operational Resilience
OPS5B	Adaptability - Flexibility for future modifications e.g. increasing reservoir storage volume, rail station at wantage and grove, construction of Marcham Bypass	Expert judgement	G	Option includes a large degree of flexibility for future modifications	Option B2 creates a direct link between East Hanney and Steventon with suitable footway and cycle facilities for future increase in walking and cycling. The option also maintains the road link between the villages for public transport.	Operational Resilience
OPS8A	3rd Party Impact - Potential to disrupt existing road network during operation	Expert judgement	A	Disruption likely to be limited	Visitor traffic is to be encouraged to use the A415 to SESRO Access Road (by the presence of the main visitor car park). Operational traffic is to use the A415 to SESRO Access Road, and would only use the Steventon Road or Hanney Road "stubs" in an emergency situation. Therefore, it can be assumed that the junctions for the Steventon to East Hanney Road Diversion need to be sized according to standard traffic growth.	Transport Planning
OPS8C	3rd Party Impact - Option facilitates infrastructure for other modes of transport, including pedestrians, cyclists and other non-motorised users	Expert judgement. Review GIS for PRoW, cycle routes, etc.	G	Option provides segregated cycle facilities, a footway that is wider than 2m, and suitable crossing infrastructure is provided for pedestrians and cyclists. Additional Bridleways or improvements or maintenance provided to existing bridleway routes are also included	All options provide new pedestrian and cycling facilities, it would be possible to expand this to also facilitate horse riding if needed.	Transport Planning
OPS8D	3rd Party Impact - Congestion at the relevant junctions for all movements, and the effective use of the transport network through innovative solutions	Expert judgement	A	Option provides a partial solution to delivering roads that will be effectively able to deal with traffic upon completion. However, the junctions designed may be unable to cope with traffic flows in future years.	Initial modelling illustrates capacity at the highway junctions is acceptable. Roundabout junctions could be replaced by signal junctions if walking / cycling demand was identified as a key issue and there was a safety concern identified at later design stages.	Transport Planning
OPS8E	3rd Party Impact - Impact on journey time reliability	Expert judgement	A	Option is not expected to either increases or improve journey times for road users on the road network	This option would lead to an increase in journey times for those travelling between Steventon and East Hanney. The bus route may need to be adjusted, unless the existing route out of Steventon was retained for buses, walking and cycling only, with other vehicles using the new road to the north of Steventon. This option creates a new segregated walking / cycling link between Steventon and East Hanney.	Transport Planning
Relative Costs						
COS1	Capex cost of the option	Cost estimate calculation for each option.	G	CAPEX estimated to result in an increase of <1% of the CAPEX for the overall SESRO project compared to the lowest cost option	Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 1.2% of the total SESRO costs. Option B2 results in a total project cost of 0.5% more than the lowest cost option.	Cost
COS3	Opportunity for cost-sharing with other SROs, NSIPs and local non-SRO schemes/plans, e.g. STT, T2ST, SWOX/Farmoor, Abingdon flood storage	Cost estimate calculation for each option.	A	Limitied opportunities identified for cost saving.	No OCC schemes currently identified on this route	Cost
Carbon Costs						
CAR1	Carbon costs associated to the Capex of the option	Carbon estimate calculation for each option.	G	Emissions (tCO2e) estimated to result in an increase of <1% of the emissions (tCO2e) for the overall SESRO project compared to the lowest emissions (tCO2e) option	Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option B2 results in a total project carbon of 0.2% more than the lowest carbon option.	Carbon
CAR3	Opportunity for mitigation e.g. smaller earthworks may lead to less carbon	Carbon estimate calculation for each option.	A	Limited likelihood and magnitude of mitigation opportunity.	Option B2 has an average route length.	Carbon
Environmental Performance						
ENV1A	Minimise impacts on Special Area of Conservation (SAC)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SAC's or potential SAC's within the boundary of the proposed S2EH Option B2. The closest SAC to the road is Cothill Fen SAC located approximately 7.1Km to the north.	Biodiversity and Nature Conservation
ENV1B	Minimise impacts on Special Protection Area (SPA)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SPA's or potential SPA's within the boundary of the proposed S2EH Option B2. The closest SPA to the road is Thames Basin Heaths SPA located 41Km to the south-east.	Biodiversity and Nature Conservation
ENV1C	Minimise impacts on Ramsar	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no Ramsar sites or potential Ramsar sites within the boundary of the proposed S2EH Option B2. The closest Ramsar to the road is South-west London Waterbodies located 57Km to the south-east.	Biodiversity and Nature Conservation
ENV1D	Minimise impacts on Site of Special Scientific Interest	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SSSI's within the boundary of the S2EH Option B2. The site is partially located within the Impact Risk Zone (IRZ) of one SSSI. The closest SSSI to the road is Barrow Farm Fen SSSI located 4.7Km to the north. Due to the distance the works are located away from the SSSI no impacts are predicted.	Biodiversity and Nature Conservation
ENV1E	Minimise impacts on National Nature Reserve	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no NNR within the boundary of the proposed S2EH Option B2. The closest NNR to the road is located 7Km to the north. Cothill NNR.	Biodiversity and Nature Conservation

ENV1F	Minimise impacts on Local Nature Reserve (LMN)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no LNR within the boundary of the proposed S2EH Option B2. The closest LNR to the road is located 7Km to the south-east of the site. The site is called Mowbray Fields and is located near East Hagbourne.	Biodiversity and Nature Conservation
ENV2A	Minimise impacts on Ancient Woodland	Natural England Ancient Woodland Maps and Professional Judgement.	G	No ancient woodland impacted	Historic mapping indicates that there is no ancient woodland present on-site	Biodiversity and Nature Conservation
ENV2B	Minimise impacts on Ancient and Veteran Trees	Woodland Trust Ancient Tree Inventory map search and professional judgement	A	Development in close proximity with potential indirect impact to ancient or veteran trees	There are no ancient or veteran trees recorded by the Woodland Trusts Ancient Tree Inventory on or close to this option. However, survey may identify trees that could be classified as ancient or veteran. As such, this option scores amber on a precautionary basis pending survey.	Biodiversity and Nature Conservation
ENV2C	Minimise impacts on Protected Trees	Check against published TPO dataset.	G	No protected trees impacted	No protected trees would be impacted.	Landscape & Visual
ENV2D	Minimise impacts on vegetation (including trees, woodland, hedges and shrubs)	Check against baseline resources and based upon high level knowledge of site from previous site visits. Professional judgement.	A	Direct impact on vegetation within a moderate proportion of construction footprint, which is of high arboricultural/amenity value (e.g. A or B grade) or biodiversity habitat in good condition. OR Direct impact on vegetation within large proportion of construction footprint, which is of lower arboricultural/visual amenity value (e.g. C grade) or biodiversity habitat in poor condition.	Construction of the road will require the removal of vegetation belts at several field boundaries, including a limited section of a woodland belt. Woodland is assumed likely to include A or B grade trees.	Biodiversity and Nature Conservation and Landscape
ENV3	Minimise impacts on Local Wildlife Sites (LWS)	Professional Judgement and LWS Citation provided by TVERC.	G	No impacts to LWS	Road B2 ilies to the north of The Cuttings and Hutchin's Copse LWS. Works areas / compounds etc should be sited to ensure there is no damage or destruction to the LWS .	Biodiversity and Nature Conservation
ENV4A	Minimise impacts on Scheduled monuments or activities which could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest scheduled monument lies approximately 1.4km to the north-east of the route option.	Historic Environment
ENV4B	Minimise impacts on listed buildings or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	The nearest listed building lies in Steventon less than 500m south of the option alignment.	Historic Environment
ENV4C	Minimise impacts on Registered Parks and Garden or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest RP&G lies over 3km north-east of the option alignment.	Historic Environment
ENV4D	Minimise impacts on Registered Battlefields or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest Registered Battlefield (1643 Battle of Chalgrove) lies over 17km east of the option alignment.	Historic Environment
ENV4E	Avoid impacts on World Heritage Sites or activities that could lead to a loss of significance, including setting	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	Blenheim Palace WHS is the nearest to the option alignment 22km to the north.	Historic Environment
ENV4F	Minimise impacts on conservation areas which could result in loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	The conservation areas of East Hanney and Steventon are within 500m of the route option	Historic Environment
ENV5A	Minimise loss to non-designated built heritage	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Extensive loss of non-designated built heritage of low value within the permanent infrastructure zone and adverse changes to within a 500m area from the edges of the permanent infrastructure OR more limited effects on non-designated built heritage of medium value	Despite the loss of a small amount of non-designated built heritage such as an undated stone on the line of the historic Wiltshire-Berkshire Canal, the section affected would only be very minor on a feature that will be largely erased by the reservoir options	Historic Environment
ENV5B	Minimise loss to paleoenvironmental remains	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or damage to low value remains within the construction area and adverse changes to similar buried remains in a 1km area around the permanent infrastructure from temporary and permanent changes to local hydrogeological regimes OR more limited effects on remains of medium value	The route passes over a number of different watercourses and paleoenvironmental remains will be present, but the extent and significance of these is unknown.	Historic Environment
ENV5C	Minimise loss to non-designated historic landscapes	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or extensive changes to low value non-designated historic landscapes within the construction area and extensive changes to the setting of the same resource outside the permanent infrastructure OR more limited effects on non-designated historic landscapes of medium value	There are no non-designated historic landscapes along the route option alignment	Historic Environment
ENV5D	Minimise loss of non-designated archaeological remains	Professional judgement, incorporating the use of the IEMA's Principles of Cultural Heritage Assessment in the UK and the Chartered Institute for Archaeologists standard and guidance document for desk based assessment	A	Permanent infrastructure and construction area will result in the loss and / permanent damage to non-designated buried and extant archaeological remains worthy of regional significance which can only be partially mitigated through preservation by record	This route option passes through a series of cropmark complexes in between Hanney Road and the railway line to the south. The cropmark complexes are present in fields S405, S408, S420 S414 and S413 as labelled by archaeological contractors who have carried out aerial investigation and mapping and geophysical survey in these zones. Collectively these complexes have been attributed a regional value given a worst case scenario. The historic route of the Wiltshire-Berkshire Canal is also likely to warrant a regional heritage value and a small portion of it will be severed by the route option	Historic Environment

ENV6A	Minimise loss of fluvial flood storage within Flood Zone 2 or 3	Measure using GIS	A	Site is within flood zone 2 and 3 but loss of storage is minor or mitigation is available	Option is not considered to have a significant impact on fluvial flood risk, 19,468m2 area of road is sited within flood zones but sufficient space has been provided for Replacement Floodplain Storage along the watercourse diversions.	Flood Risk
ENV6B	Minimise impacts of pluvial flood risk.	Expert judgement	G	No predicted impacts on pluvial flood risk	Option is not considered to have a significant impact on pluvial flood risk as it is a single carriageway. The options are considered to score similarly against this criteria.	Flood Risk
ENV6C	Minimise impacts of groundwater flood risk.	Checking existing national and local records	G	No predicted impacts on groundwater flood risk	Option is not considered to have a significant impact on groundwater flood risk. The options are considered to score similarly against this criteria.	Flood Risk
ENV7A	Minimise disturbance of potentially contaminated land	Checking existing national and local records	A	Disturbance of potentially contaminated land with one or more of the following properties: - Unlikely to have significant cost or program implications - Unlikely to cause significant harm to potential receptors - Can be easily mitigated and remediated	This option intersects Steventon Depot, a historical military depot, as well as the infilled Wiltshire / Berkshire canal, presenting potential sources of contamination which will be disturbed. Depending on the thickness of superficial deposits here this layer is unlikely to disturb the Kimmeridge Clay bedrock and potential associated bituminous material.	Land
ENV7B	Minimise disturbance of potentially contaminated land specifically in relation to authorised and historic landfills	Checking existing national and local records	G	Not within authorised and historic landfills or previous industrial sites or within 250m of authorised and historic landfills or previous industrial sites	There is no authorised or historical landfill within 250m of this option	Land
ENV8	Minimise disturbance of land with known potential for Unexploded Ordnance (UXO)	Checking existing national and local records	A	Disturbance of a low quantity of UXO which can be easily managed / remediated. Unlikely to have significant cost or program implications	A pre-desk study assessment from Zetica acquired for gate 2 identified various potential UXO risks across the SESRO area, therefore, recommend a detailed UXO survey of the area. The layout intersects Steventon Depot which has a military history and therefore UXO may be found around this area.	Land
ENV9A	Minimise loss of terrestrial priority habitats (use narrative to describe type and quantum)	Use of aerial imagery, MAGIC maps and Professional Judgement	A	Priority habitat directly impacted but mitigation feasible	Construction of the road will require the removal of Hedgerows which are Priority habitats.	Biodiversity and Nature Conservation
ENV9B	Minimise loss of aquatic priority habitats (use narrative to describe type and quantum)	Professional judgement based on knowledge of Water Framework Directive.	A	Priority habitat directly impacted but mitigation feasible	Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the any WFD waterbody to reduce potential impacts.	Aquatic Environment
ENV10A	Reduce effects on North Wessex Downs Area of Outstanding Natural Beauty (AONB) and its setting	Professional judgement.	A	AONB and its setting likely to be affected. Effect is unlikely to be significant.	The introduction of traffic, highway infrastructure and lighting into the rural landscape north of the GWR Main Line would be within the context of existing infrastructure, including a depot, substation, highway and solar farms to the north. This would interrupt the medium to large scale field pattern divided by hedgerows and woodland belts. These contribute positively to the local landscape character and setting of the North Wessex Downs AONB. Effect on landscape character and tranquillity of AONB potentially significant in the short term, but could be mitigated in the long term. Residual effects of the highway on the AONB would therefore only be slightly worse than the existing Steventon/Hanney Road which it would replace, due to the slightly extended alignment and the presence of lighting at night.	Landscape & Visual
ENV10B	Reduce effects on local landscape character	Professional judgement.	R	Effect on local landscape character is likely to be significant.	The introduction of traffic, highway infrastructure and lighting into the rural landscape north of the GWR Main Line would be within the context of existing infrastructure, including a depot, substation, highway and solar farms to the north. This would interrupt the medium to large scale field pattern divided by hedgerows and woodland belts, which contribute positively to the local landscape character. Therefore the local landscape character and levels of tranquillity (also affected by noise) would be eroded. Although mitigation planting could help to reduce the residual long term effect, it would potentially remain significant due to the introduction of new bridges, a wider road footprint and extended alignment compared with the existing Steventon/Hanney Road.	Landscape & Visual
ENV11A	Reduce effects on panoramic views from national trail, open access land and important viewpoints in AONB	Professional judgement.	A	Effect on panoramic views from national trail, open access land and important viewpoints in AONB unlikely to be significant.	Traffic and highway infrastructure would be visible in some panoramic views from The Ridgeway National Trail, but would be seen in context of existing infrastructure in the landscape north of the GWR Main Line. Effects on such panoramic views could be mitigated in the long term to ensure it would be similar to the existing Steventon/Hanney Road which it would replace.	Landscape & Visual
ENV11B	Reduce effects on sensitive local visual receptors	Professional judgement.	R	Effect on local views of sensitive visual receptors likely to be significant.	Traffic and highway infrastructure would be visible in local views from some PRoWs, direct views of some isolated residential properties and the southern edge of East Hanney and western and northern edges of Steventon. Effect on most views could be reduced in the long term, but some significant effects may remain, including effects at night due to the presence of lighting.	Landscape & Visual
ENV12	Minimise disturbance/encroachment into Air Quality Management Area (AQMA)	Based on an understanding of the scale and nature of activities, air quality management areas (AQMAs) were identified in close proximity to the proposed works.	G	Site is located further than 1km from AQMA OR no construction traffic must go through an AQMA	Marcham AQMA is approximately 4 km NW of Road B2 at its closest point. The anticipated construction and operational activities would likely lead to a negligible change in air quality.	Air Quality
ENV13	Minimise disturbance/encroachment into Groundwater Source Protection Zone (SPZ)	Magic maps	G	Site is within Zone 3 or not within a SPZ	Site is not within an SPZ.	Aquatic Environment
ENV14A	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Cow Common Brook and Portobello Ditch' WFD waterbody (GB106039023360) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - The route has one crossing on the Cow Common Brook and Portobello Ditch WFD waterbody as well as surrounding tributaries. Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts. The route overlaps (intersects) with the proposed Eastern Watercourse Diversion (required mitigation for BNG and WFD compliance) in an area that is already a narrow corridor. This area would need to be assessed further.	Aquatic Environment
ENV14B	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ock and tributaries (Land Brook confluence to Thames)' WFD waterbody (GB106039023430) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment

ENV14C	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Thames (Evenlode to Thame)' WFD waterbody (GB106039030334) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14D	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Sandford Brook (source to Ock)' WFD waterbody (GB106039023410) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14E	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Childrey Brook and Norbrook at Common' WFD waterbody (GB106039023380) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - The route has one crossing on the Childrey Brook and Norbrook at Common Barn WFD waterbody as well as surrounding tributaries. Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14F	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ginge Brook and Mill Brook' WFD waterbody (GB106039023660) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14G	Option does not affect Water Framework Directive (WFD) Quality Elements within one of WFD waterbodies downstream of the River Thame to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives. These WFD waterbodies include: - Thames Wallingford to Caversham - WFD waterbody GB106039030331 - Thames (Reading to Cookham) - WFD waterbody GB106039023233 - Thames (Cookham to Egham) - WFD waterbody GB106039023231 - Thames (Egham to Teddington) - WFD waterbody GB106039023232	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV15A	Maximise potential for future environmental benefits (terrestrial), e.g. increase tree planting	Professional Judgement	G	Site allows substantial additional environmental benefits to be realised	Being a predominantly arable landscape there is plenty of opportunity for environmental enhancement through the planting of trees and creation of habitats with high distinctiveness. Also, opportunity for the creation of wetland areas including wet woodland and ponds.	Biodiversity and nature conservation
ENV15B	Maximise potential for future environmental benefits (aquatic), e.g. increase wetlands area	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Site allows substantial additional environmental benefits to be realised	Connectivity through the watercourse and associated wetlands is crucial. Thus any road crossings will need to consider this appropriately and mitigation provided.	Aquatic Environment
ENV16	Maximise flexibility in routing diverted watercourses so their habitats can be of sufficiently high quality to contribute to catchment Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Site allows some flexibility in routing watercourses / Good quality habitat options are available	Road crossings need to ensure sufficient light and connectivity through the structure. Preference is a clear span, bridge on all crossings of principal WFD waterbodies (blue line) but an appropriately sized box culvert is acceptable on other watercourses in the WFD catchment. Pipe crossings will be deemed to be unacceptable and should be avoided.	Aquatic Environment
ENV17	Minimise disturbance/encroachment into Local Geological Sites (LGS)	Checking existing national and local records	G	Site is located more than 250m from LGS	No LGS present	Biodiversity and nature conservation
ENV18A	Minimise impacts associated with Noise and Vibration as a consequence of the construction of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment. Red band distance is from works site/road to the SOAEL+5dB, and Amber distance is from SOAEL+5dB to the SOAEL. Road Construction: Red 60m, Amber 61-99m, Green 100m. Construction Traffic: Red 40m, Amber 41-184m, Green 185m. Road Const. (bridge construction): Red 75m, Amber 81-124m, Green 125m. (NOTE: No sensitive properties have been identified within 125m of potential piling works at road bridges and significant effects are not anticipated. Distances referenced in the assessment are those measured between the proposed roads and receptors). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis (with >700 extra receptors included, namely at Diversion Road C, which is outside of Gate 2 Study Area).	R	Significant effects likely which would be difficult to mitigate	The closest noise sensitive property is located approximately 45m from Steventon to East Hanney Diversion Road Option B2, with four properties between ~80 to 95m from the option. Based on the indicative assessment, one property is predicted to be in the red band during construction, while a further four properties are predicted to be within the Amber band.	Noise

ENV18B	Minimise impacts associated with Noise and Vibration as a consequence of the operation of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment (inc. bunding around sidings). Red band is from works site to the SOAEL+5dB distance, and Amber is from SOAEL+5dB distance to the SOAEL. Rail Sidings: Red 675m, Amber 676-1209m, Green 1210m. This is based on worst-case activity, Material Handling, which includes potential for works between 06:00 to 07:00 and was assessed using night-time noise assessment criteria at Gate 2 as a precautionary approach. The noise emission for the activity is based on G2 assumptions, with update made following review by Costain (JB 05Jun). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis.	R	Significant effects likely which would be difficult to mitigate	The closest noise sensitive property is located approximately 45m from Steventon to East Hanney Diversion Road Option B2, with six properties between ~80 to 114m from the option. Based on the indicative assessment, one property are predicted to be in the Red band and six properties are predicted to be in the Amber band as a result of operational road traffic noise.	Noise
ENV19A	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the construction of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	There are between 10 - 100 high sensitivity receptors (i.e. dwellings) within 350 m of the Road B2 route with the closest being approximately 40 m away. Construction activities include the carriageway (rural two-lane carriageway approximately 6.2 km in length) with a potential cycle / footway) and one culvert would be required. It is considered that there are no proposed dust-generating construction activities that could not be managed using normal good practices (IAQM construction dust guidance, 2016) to prevent significant effects at any off-site receptor. Given that relatively low numbers of plant and items of machinery would be used and the anticipated number of construction traffic, the potential effects would likely lead to a negligible change in air quality.	Air Quality
ENV19B	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the operation of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	Road B2 directs traffic away from Steventon and based on the 2021 Traffic Flow Data (see 405335-T4-02 Movement Strategy Report) and anticipated tourism, the likely AADT is such that the potential effects from vehicle emissions would likely lead to a negligible change in air quality at nearby receptors.	Air Quality
ENV20A	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the construction of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Construction activities would lead to noticeable changes to the visual amenity of the local community in the vicinity of East Hanney and Steventon, in part due to lighting during occasional night-time construction works. (Effect on visual amenity in Steventon greater than Option A.)	Landscape & Visual
ENV20B	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the operation of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Traffic and highway infrastructure associated with the existing Steventon/Hanney Road would be moved further from East Hanney, but would affect the visual amenity of Steventon to a greater extent. Effects on day-time visual amenity could be reduced in the long term with planting mitigation, though a noticeable change on visual amenity in Steventon would likely remain. Effect of lighting at night likely to be barely perceptible in context of existing light pollution within Steventon and only noticeable in relation to a very limited part of East Hanney. (Effect on visual amenity in Steventon slightly greater than Option B1.)	Landscape & Visual
ENV21A	Minimise impacts associated with solid discharge during construction.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road construction likely to be readily controlled using standard construction mitigation	Pollution
ENV21B	Minimise impacts associated with solid discharge during operation.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road operation likely to be readily controlled using standard mitigation	Pollution
Community and Planning Considerations						
CPC1	Distance to the nearest property that will stay during construction (metres)	GIS	R	Less than 250m from the nearest property	50m to the nearest property	Socio-Economic
CPC2	Minimise impacts on local community during construction associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	A	Community access/use of community assets is disrupted during construction	Construction of the new road may cause closures or limited travel (disruption) on the A338 and Hanney Road. Residents living in East Hanney and West Hanney who want to access medical treatment located in Wantage may experience disruption with the most direct route being through the A388. PRoW severance has been identified near East Hanney, these are residential areas and likely to be used by the community as walking routes. They do not appear to link with community assets. The proposed road passes through a retail park/industrial estate, there are currently no community assets within this estate and this unit will be removed as part of the overall project.	Socio-Economic
CPC3	Minimise impacts on local community during operation associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	G	Community access/use of community assets is not disrupted during operation	Operation of the Steventon Road B2 should lead to no community assets being disrupted. The operation of the new Steventon Road B2 potentially causes severance for multiple PRoWs, and with these paths near residential areas, individuals potentially use the PRoW to access green spaces. The PRoW are not linked to any specific community assets. It is possible that mitigation will maintain access for these PRoW and enhance use.	Socio-Economic
CPC4A	Are public rights of way (PRoW) disrupted or adversely affected?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Recreational resources / rights of way of local importance are disrupted or affected. The site is likely to affect public rights of way	The construction and operation of the new Steventon Road B2 potentially causes severance for multiple PRoWs, and with these paths near residential areas, individuals potentially use the PRoW to access green spaces. The PRoW are not linked to any specific community assets. It is possible that mitigation will maintain access for these PRoW and enhance use.	Socio-Economic

CPC4B	Are there opportunities to create or improve linkages of Public Rights of Way (PRoW) and recreational routes?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Links to a recreational resource / right of way of local importance can be enhanced	The construction and operation of the new Steventon Road B2 potentially causes severance for multiple PRoWs, and with these paths near residential areas, individuals potentially use the PRoW to access green spaces. The PRoW are not linked to any specific community assets. It is possible that mitigation will maintain access for these PRoW and enhance use. The road potentially affects access and utility of the proposed restoration of the Wilts and Berkshire canal path.	Socio-Economic
CPC5	Maximise potential opportunity for recreational benefits	GIS analysis of PRoW, open spaces, cycle routes, canals, other forms of regional/nationally important receptors (eg National Cycle Routes), and community assets.	A	Option allows some additional recreational benefits to be realised	The road may hinder access to the reservoir and planned restoration of the Wilts and Berkshire canal path. If access is maintained or improved then this will allow additional recreational benefits.	Socio-Economic
CPC6	Support the realisation of socio-economic incentives on SESRO, including employment, skills, tourism, sustainable travel, connecting people with nature and environmental education	GIS analysis of footprint, community assets, private residents, and businesses. Also awareness of overall project objectives is needed to conclude if the designs align with these.	A	Site supports some of the social-economic incentives of the overall scheme	The road will have minimal negative impacts on community assets and therefore minimal disruption during both construction and operation phases.	Socio-Economic
CPC7	Minimise overall SESRO Order Limits extent and land acquisition, without compromising SESRO needs and project benefits	Spatial comparison of land that would likely be included in the DCO Order Limits, including construction working areas, access and highways or PRoW interactions.	G	Requires minimum Order Limits extent	Road A, B1 and B2 all are fairly close to the reservoir footprint and are partially located within the area currently safeguarded in the VoWHDC Local Plan. The road and works area to construct it would be close to the RSMH1 option should that be chosen, minimising the Order Limits extent and land acquisition.	Consenting
CPC8	Aim for consistency with published and (insofar as possible) emerging Local Plan land use allocations	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in existing and any emerging Local Plan documents and any Supplementary Planning Documents.	G	Low or no impact	Lies within the SESRO safeguarded area (CP14 and CP14a). No land use allocation conflicts with VoWHDC Local Plan. No land use allocation conflicts with the consultation draft Joint Local Plan 2041. No land use allocation conflicts with the Oxfordshire County Council Minerals and Waste Local Plans. Not within the area of the South Oxfordshire District Council Local Plan.	Consenting
CPC9	Aim for consistency with any adopted Neighbourhood Plan policy applicable to the land area affected	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in any made Neighbourhood Plan.	G	Low or no impact	West part of road lies within the draft East Hanney Neighbourhood Plan, which has been submitted for examination. Traffic is also considered an issue in the NP, particularly on the A338. Access into and out of the village is becoming increasingly difficult - providing the road from East Hanney to Steventon to the south of the village (as opposed to in the centre of the village) may help to reduce some congestion. The east part lies within Steventon Neighbourhood Plan which is preparing for submission and a draft plan is not yet available. The middle section of the road goes through Ardington and Lockinge, although no plans are in preparation.	Consenting
CPC10	Avoid development of infrastructure within specifically designated areas or their setting, as applicable (e.g. Green Belt, AONB, Common Land, Open Space)	Spatial comparison with designated sites, their settings, and the nature of development works expected.	G	Does not require development of above-ground infrastructure within these designations or development likely to have more than a negligible effect on the setting (where applicable)	Not located within a specifically designated area, such as Green Belt, AONB, Common Land or Open Space.	Consenting
CPC11	Avoid encroachment on any safeguarded land in minerals and waste policy, unless the minerals can be beneficially utilised as a result	Spatial comparison of allocated sites and review of policy wording in existing and any emerging Waste and Minerals Local Plan documents.	G	Low or no impact	Not located in minerals safeguarding area or on a site allocated for minerals or waste uses.	Consenting
CPC12	Ability to integrate with existing nationally-significant infrastructure, statutory undertakers' major infrastructure, or any proposed future Nationally Significant Infrastructure Projects (NSIP) (such as that of National Highways, Environment Agency, Network Rail)	Review of NSIP projects on PINS's register; review of Network Rail and National Highways investment plans; spatial review of statutory undertakers' assets.	G	Low or no interaction with existing infrastructure or proposed Nationally Significant Infrastructure Project (NSIP)	No NSIPs currently registered. No known proposals from Network Rail or National Highways. The National Highways RIS3 Investment Plan will be published in 2024 which will detail the A34 improvement project. Potential to serve Grove Railway station should RSMH1 or RSMH4a/b be used to develop the station. Existing gas, HV mains, potable water, electric lines and telecoms lines cross Road B2.	Consenting
CPC13	Minimise the consenting complexity due to the need for additional consents and licenses that may be required outside the Development Consent Order (DCO), e.g. additional Flood Risk Activity Permit, Environmental Permit, abstraction/discharge Licence, European protected species licence, etc	Review of the nature of expected development works against the list of other consents and licenses developed at Gateway 2.	A	One or more additional consent/license required	Roads A, B1 and B2 cross over multiple PRoW and so a Temporary Traffic Regulation Order may be required, although this can potentially be included within the DCO application. A section 278 highways agreement, street works notice and highway works permit will also likely be necessary, although could also be included within the DCO. The location of Roads A, B1 and B2 within areas of Flood Zone may also require a Standard or Bespoke Flood Risk Activity Permit or a Flood Risk Activity Exemption permit from the Environment Agency, but these will be required anyway for other reservoir works.	Consenting
CPC14	Avoid or minimise the need for any consequential development consenting (i.e. displacement or alteration of other development)	Review of existing development within the likely land-take, its nature and scale.	A	Other existing development requires planning permission to relocate or alter	Passes through the existing freight yard and existing light industrial 'Steventon Storage' site. However, this site would also be affected by the likely reservoir footprint and embankment construction area. Existing gas, HV mains, potable water, electric and telecoms lines would need to be diverted as pass through Road B2. However, this can form part of the DCO associated development or potentially be delivered through statutory undertaker permitted development.	Consenting
CPC15	Minimise interfaces/reliance on external governing/third parties (e.g. Removing the canal removes a stakeholder, reducing interfaces and permissions required from Network Rail, National Highways, National Grid)	Review GIS layers for services against the options. Expert Judgement.	R	Multiple complex interfaces with others may complicate or delay progress	Stakeholders involved include: small local businesses, Network Rail, National Highways England, National Grid, local solar farm. Options A and B1 score better than B2 and C due to interactions with overhead lines and water.	Consenting
CPC17	The option provides economic benefits by directing traffic through local town centres which will boost their footfall and potential for people to stop and utilise their local economy	Expert judgement	A	The routes for this option provide a bypass to some of the local towns, which means some of the visitors may be encouraged to shop in only some of these towns and only some towns may experience boosts to their local economy	Moves the route north of Steventon and to the south of East Hanney.	Transport Planning
CPC18	Influence the location and layout of development to maximise the use and value of existing and planned sustainable transport investment	Expert judgement	A	Option partially supports existing and planned public transport infrastructure between key destinations	Makes the east-west movement longer for vehicles (except buses, as well as walking and cycling) and requires a specific facility to turn buses around in Steventon. Hanney Road in Steventon will provide access for buses as well as for pedestrians and cyclists.	Transport Planning

CPC19	Maximise the benefits of travel for non-motorised users between key destinations	Expert judgement	G	Provides numerous routes with infrastructure that prioritises non-motorised users to encourage users to walk, cycle or use bridleways	The road alignment will enable the provision of ped/cycle facilities in the form of a shared route. An equestrian path could also be provided if the need for one is identified.	Transport Planning
Property & Land Acquisition						
PRP1	Minimise loss of sensitive properties, i.e. residential, commercial, green belt, common land, historical or community assets due to project delivery	Review Land allocation mapping on ArcGIS.	A	Moderate or temporary loss of sensitive properties	Options A, B1 and B2 run through storage yard, Employment land will be affected, however, asset would have to be removed as part of the overall scheme. otherwise land is mostly agricultural land.	Property & Land Acquisition
PRP2	Minimise loss of land allocated within the Local Plan for alternative higher value / social / cultural value uses, e.g, residential, historical or community assets due project delivery	Review Land allocation mapping on ArcGIS.	A	Temporary loss of allocated land for higher value or social value properties	B2 runs through land with residential planning application (not consneted) at the end of route	Property & Land Acquisition
PRP3	Minimise permanent loss of best and most versatile agricultural land (grades 1, 2 and 3)	Review of agricultural grading layer on ArcGIS, based on 2019 Provisional Agricultural Land Classification	A	Results in loss of any Grade 2 agricultural land or >50% Grade 3 agricultural land	Agricultural land approximate percentage: grade 3 = 81% grade 4 = 19%	Property & Land Acquisition
PRP4	Assessment of Land and Property asset costs and associated compensation due under the Compensation Code	Review of land use / designation on ArcGIS	A	Land acquisition costs likely to be relatively moderate.	Agricultural land values can range from £8,000 - 14,000 in the area. Landowners may be eligible for Severance claims depending on design and farm practices. Employment land can range from £250,000 - £500,000 plus the value of any fixed assets or constructions.	Property & Land Acquisition
PRP5	Assessment of Special Category Landowners (SCLs), utility infrastructure, national asset protection agencies and Crown bodies	Review of affected landowners	A	Nature and number of SCL is medium / low and may represent delivery risks	No SCLOs. But a statutory Landowner - Church commisioners for England.	Property & Land Acquisition
PRP6	Minimise disruptions of landowners access to their land required for temporary works	Review location in conjunction with existing road network	G	Landowners able to access their land during construction and operation phases	Landowners able to access their land during construction and operation phases.	Property & Land Acquisition

Appendix H East Hanney to Steventon Road C Criteria Workbook

East Hanney - Steventon Road C

Criteria code	Criteria Description	Method of Assessment	RAG	Description of RAG	Narrative	Sub-Theme
Constructability						
CON1	Safety - Risk of endangering construction workers or members of the public during construction e.g. water, ground, height, rail, road and utilities	Look at programme and list types of construction involved. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	A	Works can be constructed safely but enhanced control measures required	Option C requires 14 crossings, including 5 bridges. Option C would require work under existing overhead HV cables, and potentially more HV cable diversions. Option C is likely to result in increased vehicle movements on the existing road network.	Health and Safety
CON2A	Programme - Duration, longest /shortest, but also consider whether the longer duration has an impact on the overall scheme programme	Compare differences in the programmes which would materialise from different options. Consider earthworks seasons.	R	Likely to impact the critical path of the Gate 2 SESRO programme and therefore the estimated overall duration of the SESRO construction works.	Option C is accessed as scoring red as it has a length of 7.1km. The option may impact the Gate 2 programme	Programme
CON2B	Programme - Opportunities for construction programme acceleration through efficiencies	Compare differences in the programmes which would materialise from different options.	A	The option has limited potential to introduce programme efficiencies and reduce the construction programme	Option C is away from the main construction site, there may be opportunities to construction programme brought about by avoiding the need for public vehicle access through the main site.	Programme
CON2C	Programme - Dependencies i.e. proximity or physical relationships between elements of scope that introduce programme dependencies	Is the options on the critical path? Will it impact other critical activities?	G	Minor programme dependencies	Option C creates separation from the main works and therefore doesn't have major dependencies with the other components of the scheme. Hence scores green.	Programme
CON2D	Programme - Risk	Are there items in the construction which have a significant programme risk	A	Moderate programme risk	Option C has a high chance of programme risk and so scores amber	Programme
CON3A	Logistics - Space available for construction and materials storage	Determine space constraints using GIS and options layouts from option definition.	G	Adequate space	Option C is unlikely to be constrained by the railway and reservoir embankments. Therefore Option C scores green.	Logistics
CON3B	Logistics - Suitable and efficient access for construction workers, deliveries and waste removal including minimisation of lengths of new roads for access during construction	Determine method of access using GIS and options layouts from option definition.	A	Due to restricted access, it may require a moderate (relative) length of road for construction	For Option C, the A415 to SESRO road wouldn't be used for construction access; a separate method of access would be required. Some lengths of Option C may be challenging to access - for example, the road goes close to an existing solar farm, so scores amber.	Logistics
CON3C	Logistics - Import of materials or resources during construction	Use quantity estimates to assess different options.	R	Large amount of import materials required	The Steventon to East Hanney Road diversion requires the import of materials for the road surface (which is assumed to be achieved via the A415 to SESRO Access Road). The earthworks required for Option C road embankment would need to be sourced from either side of the road. If earthworks need to be transported from the main site the material would need to be transferred south of the railway, most likely via the A415 and A338. Due to this the logistics are considered challenging.	Logistics
CON3E	Logistics - Vehicle movements	Use vehicle movement estimates to assess different options.	R	Construction works likely to require a large number of vehicle movements and vehicle movements may be dificult.	The earthworks required for Option C road embankment would need to be sourced from either side of the road. If earthworks need to be transported from the main site the material would need to be transferred south of the railway, most likely via the A415 and A338. Option C has a high estimated earthworks requirement. Therefore, the number of vehicle movements are considered high and so scores red.	Logistics
CON4A	Construction Complexity - Temporary conditions/works requirements e.g. embankment slope stability and moisture outside of placement seasons.	Expert Judgement	G	Temporary Works requirements minimal and can be used in the permanent state and no extension to the programme	Complex temporary works is not expected for this option and so scores green.	Construction complexity
CON4B	Construction Complexity - Location conflict/opportunity with another engineering component of the scheme or other SRO/non-SRO schemes, e.g. Severn to Thames Transfer (STT), Thames to Southern Transfer (T2ST), TW Swindon and Oxfordshire supply zone transfer, Transfer to Farmoor Reservoir	Expert judgement and knowledge of surrounding schemes	A	Location / layout of the option neither clashes nor provides an opportunity to be developed with another component of this scheme (or another scheme)	Option C is located away from the main SESRO site, which increases the risk of conflict with another construction project. Hence it scores Amber. Furthermore, there is no opportunity to divert overhead HV (required to be diverted for the reservoir itself) within the road alignment.	Construction complexity
CON4C	Construction Complexity - Minimise the number and complexity of additional structures/assets required or modifications to the existing structures/assets in order to facilitate the option, e.g. bridges, culverts, crossings	Determine using GIS and options layouts from option definition.	R	Option requires a complex and/or high number of additional structures and/or modifications to existing structures.	Option C requires ~163,500m3 of fill material, 14 crossings and 5 bridges. This results in a high construction complexity so scores Red.	Construction complexity
CON5A	3rd Party Impact - Potential to disrupt existing road network during enabling works and construction	Expert judgement	R	Disruption likely to be significant	Option is new construction away from existing road network. Likely to affect local access tracks or minor roads. Disruption is likely.	3rd Party Impact
CON7A	Ground - Terrain of site, and implications for the need for earthworks and engineered slopes	Use of lidar and civil 3D models to assess amount/location of earthworks required	A	Terrain is unfavourable to the design of assets and therefore increases the amount of earthworks required	Option C is largely routed across a relatively flat area. However, at the eastern end the alignment routes up a hill (rising 20m in approximately 1km), and so scores amber.	Construction complexity
CON7B	Ground - Risk of unexpected conditions	Use of expert judgement based on comparable areas	A	Moderate exposure to risk of unexpected ground conditions.	From initial investigations, the ground conditions for Option C may have moderate risks and so the options are considered to score amber against this criteria.	Construction complexity
CON7C	Ground - Impact of ground conditions on the complexity of design and construction	Use of expert judgement	G	Ground conditions are unlikely to increase the complexity of design and construction with likely only a minimal (if any) impact on cost or requirement for materials that are difficult to source	From initial investigations, the ground conditions are likely to be favourable for Option C and so the options are considered to score green against this criteria.	Construction complexity
Operability						
OPS1A	Safety - Risk of endangering operational staff, visitors or members of the public during operation	Look at operational activities and public access. Identify any that could potentially score red or amber. Sub-list of activities which would make it amber i.e. Tunnelling = Amber	G	Works can be operated safely without enhanced control measures	Minimal risk of endangering operational staff, visitors or members of the public during operation, and so scores green	Health and Safety

OPS1B	Safety - Access and egress for operational staff, visitors, deliveries and waste removal during normal operations and emergencies	Tunnel silt issue to be considered by expert judgement	G	Access/egress can be provided	Access and Egress is not considered to be an issue and so scores green.	Health and Safety
OPS2A	Maintenance - Ease of maintenance	Expert judgement	G	Majority of maintenance activities could be undertaken during limited closure periods and / or with limited disruption	Maintenance is not considered to be an issue and so scores green.	Operational Complexity
OPS4A	Reliability - Footprint of the option within flood zones (as an indication of the potential for damage and the challenge of operation / maintenance during flood events)	Review GIS supported by expert judgement	A	Option is within the flood zone, however damage is not considered to be a significant risk	Option is partly within a flood zone, however damage is not considered to be a significant risk	Operational Resilience
OPS4B	Reliability - The option does not have a single point of failure but rather includes backup infrastructure so that it can remain in operation if the primary infrastructure is unavailable, e.g. siphons in addition to tunnel for emergency discharge or alternative road route to reservoir crest	Expert judgement	A	There is a single point of failure but mitigation measures can be introduced to allow for continued operation, which might be a delayed or reduced service	In a scenario where the Steventon to East Hanney Road Diversion is out of operation it is assumed that other east-west routes would be used (e.g. A417 or A415).	Operational Resilience
OPS5A	Adaptability - Space available for future expansion of social / recreation infrastructure	Expert judgement	A	Limited opportunity / space available for future expansion (however this expansion is unlikely to be required)	Option C could potentially create space at the main SESRO site which could be used for increased social / recreational infrastructure. However, access to this recreational infrastructure would be restricted as there would be no bus route available close to the reservoir.	Operational Resilience
OPS5B	Adaptability - Flexibility for future modifications e.g. increasing reservoir storage volume, rail station at wantage and grove, construction of Marcham Bypass	Expert judgement	R	Option includes no flexibility for future modifications	Option C would not provide a direct link to the site which could be used for bus / pedestrian / cycle / horse riding access to the reservoir. Therefore, there is limited flexibility for future modifications related to reservoir usage.	Operational Resilience
OPS8A	3rd Party Impact - Potential to disrupt existing road network during operation	Expert judgement	R	Disruption likely to be significant	Option C has a likelihood of impacting the wider road network. The journey between Steventon and East Hanney would now be longer and need to pass through the edge of Grove. Traffic reassignment increases the risk of the need for other junctions to be upgraded.	Transport Planning
OPS8C	3rd Party Impact - Option facilitates infrastructure for other modes of transport, including pedestrians, cyclists and other non-motorised users	Expert judgement. Review GIS for PRoW, cycle routes, etc.	A	Option provides a shared footway for both cyclists and pedestrians along at least one side of the carriageway. Bridleways are partly improved	All options provide new pedestrian and cycling facilities, it would be possible to expand this to also facilitate horse riding if needed. Options A, B1 and B2 provide these facilities in closer proximity to the reservoir than Option C.	Transport Planning
OPS8D	3rd Party Impact - Congestion at the relevant junctions for all movements, and the effective use of the transport network through innovative solutions	Expert judgement	R	Option fails to consider the impact of traffic joining at key junctions, including failing to consider how the routing could provide beneficial routes for other purposes not relating to access to the SESRO site	Option C would have the potential to impact different junctions; it is unclear at this time whether this could result in additional junction congestion, however, it is assumed that there would be a wider impact on the existing road network, and the potential to change traffic patterns..	Transport Planning
OPS8E	3rd Party Impact - Impact on journey time reliability	Expert judgement	R	Option increases journey times for road users on the road network severely	Option C would increase journey times for those travelling between Steventon and East Hanney. This includes the bus route, which would need to travel in and out of Steventon to maintain connection.	Transport Planning
Relative Costs						
COS1	Capex cost of the option	Cost estimate calculation for each option.	A	CAPEX estimated to result in a an increase of >1% and <5% of the CAPEX for the overall SESRO project compared to the lowest cost option	Initial high-level cost estimates indicate that the range in costs for the SESRO main access road options represents approximately 1.2% of the total SESRO costs. Option C results in a total project cost of 1.2% more than the lowest cost option.	Cost
COS3	Opportunity for cost-sharing with other SROs, NSIPs and local non-SRO schemes/plans, e.g. STT, T2ST, SWOX/Farmoor, Abingdon flood storage	Cost estimate calculation for each option.	A	Limitied opportunities identified for cost saving.	No OCC schemes currently identified on this route	Cost
Carbon Costs						
CAR1	Carbon costs associated to the Capex of the option	Carbon estimate calculation for each option.	G	Emissions (tCO2e) estimated to result in an increase of <1% of the emissions (tCO2e) for the overall SESRO project compared to the lowest emissions (tCO2e) option	Initial high-level carbon estimates indicate that the range in carbon for the SESRO main access road options represents approximately 0.5% of the total SESRO carbon. Option C results in a total project carbon of 0.5% more than the lowest carbon option.	Carbon
CAR3	Opportunity for mitigation e.g. smaller earthworks may lead to less carbon	Carbon estimate calculation for each option.	A	Limited likelihood and magnitude of mitigation opportunity.	Option C is a long route and requires more fill for its embankments, as well as more watercourse crossings (requiring more bridges or culverts).	Carbon
Environmental Performance						
ENV1A	Minimise impacts on Special Area of Conservation (SAC)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SAC's or potential SAC's within the boundary of the proposed S2EH Option C. The closest SAC to the road is Cothill Fen SAC located approximately 8.3Km to the north.	Biodiversity and Nature Conservation
ENV1B	Minimise impacts on Special Protection Area (SPA)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SPA's or potential SPA's within the boundary of the proposed S2EH Option C. The closest SPA to the road is Thames Basin Heaths SPA located 40Km to the south-east.	Biodiversity and Nature Conservation
ENV1C	Minimise impacts on Ramsar	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no Ramsar sites or potential Ramsar sites within the boundary of the proposed S2EH Option C. The closest Ramsar to the road is South-west London Waterbodies located 56Km to the south-east.	Biodiversity and Nature Conservation
ENV1D	Minimise impacts on Site of Special Scientific Interest	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no SSSI's within the boundary of the S2EH Option C. The site is partially located within the Impact Risk Zone (IRZ) of one SSSI. The closest SSSI to the road is Culham Brake SSSI located 6Km to the north east. Due to the distance the works are located away from the SSSI no impacts are predicted.	Biodiversity and Nature Conservation

ENV1E	Minimise impacts on National Nature Reserve	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no NNR within the boundary of the proposed S2EH Option C. The closest NNR to the road is located 8.5Km to the north. Cothill NNR.	Biodiversity and Nature Conservation
ENV1F	Minimise impacts on Local Nature Reserve (LMN)	Professional Judgement and use of MAGIC maps.	G	No statutory designated sites within 100m of proposed option footprint OR no indirect impact on statutory designated site	There are no LNR within the boundary of the proposed S2EH Option C. The closest LNR to the road is located 5Km to the south-east of the site. The site is called Mowbray Fields and is located near East Hagbourne.	Biodiversity and Nature Conservation
ENV2A	Minimise impacts on Ancient Woodland	Natural England Ancient Woodland Maps and Professional Judgement.	G	No ancient woodland impacted	Historic mapping indicates that there is no ancient woodland present on-site	Biodiversity and Nature Conservation
ENV2B	Minimise impacts on Ancient and Veteran Trees	Woodland Trust Ancient Tree Inventory map search and professional judgement	A	Development in close proximity with potential indirect impact to ancient or veteran trees	There are no ancient or veteran trees recorded by the Woodland Trusts Ancient Tree Inventory on or close to this option. However, survey may identify trees that could be classified as ancient or veteran. As such, this option scores amber on a precautionary basis pending survey.	Biodiversity and Nature Conservation
ENV2C	Minimise impacts on Protected Trees	Check against published TPO dataset.	G	No protected trees impacted	No protected trees would be impacted.	Landscape & Visual
ENV2D	Minimise impacts on vegetation (including trees, woodland, hedges and shrubs)	Check against baseline resources and based upon high level knowledge of site from previous site visits. Professional judgement.	A	Direct impact on vegetation within a moderate proportion of construction footprint, which is of high arboricultural/amenity value (e.g. A or B grade) or biodiversity habitat in good condition. OR Direct impact on vegetation within large proportion of construction footprint, which is of lower arboricultural/visual amenity value (e.g. C grade) or biodiversity habitat in poor condition.	Construction of the road will require the removal of a small copse and vegetation belts at a larger number of field boundaries, including some woodland belts. Woodland is assumed likely to include A or B grade trees. (Impact on vegetation likely to be slightly worse than the other options).	Biodiversity and Nature Conservation and Landscape
ENV3	Minimise impacts on Local Wildlife Sites (LWS)	Professional Judgement and LWS Citation provided by TVERC.	G	No impacts to LWS	No LWS located within or adjacent to the proposed road.	Biodiversity and Nature Conservation
ENV4A	Minimise impacts on Scheduled monuments or activities which could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The nearest scheduled monument is a settlement site just over 2km north-east of the option alignment.	Historic Environment
ENV4B	Minimise impacts on listed buildings or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	The option alignment lies within 500m of listed buildings in Steventon and on the A338, with Grade II Pinmarsh Farmhouse being the closest listed structure 160m from the option alignment.	Historic Environment
ENV4C	Minimise impacts on Registered Parks and Garden or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The Albert Park RP&G lies approximately 4.25km to the north-east of the option alignment	Historic Environment
ENV4D	Minimise impacts on Registered Battlefields or activities that could lead to a loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	The 1643 Chalgrove Registered Battlefield nearest to the option alignment lies just under 18km to the east.	Historic Environment
ENV4E	Avoid impacts on World Heritage Sites or activities that could lead to a loss of significance, including setting	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Permanent infrastructure more than 500m from designated heritage asset and/or no likely setting effects. Construction area not located within 100m of designated heritage assets	Blenheim Palace WHS lies 24km to the north of the option alignment.	Historic Environment
ENV4F	Minimise impacts on conservation areas which could result in loss of significance	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	A	Permanent infrastructure within 500m of designated heritage asset with potential for setting effects. Construction area located within designated heritage asset; mitigation may be required but option still feasible	The option alignment lies within 400m of the Steventon conservation area.	Historic Environment
ENV5A	Minimise loss to non-designated built heritage	Professional judgement, incorporating Historic England's Good Practice Advice Note no.3 regarding the setting of heritage assets	G	Extensive loss of non-designated built heritage of low value within the permanent infrastructure zone and adverse changes to within a 500m area from the edges of the permanent infrastructure OR more limited effects on non-designated built heritage of medium value	The option alignment crosses the historic former line of the Wiltshire-Berkshire Canal.	Historic Environment

ENV5B	Minimise loss to paleoenvironmental remains	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or damage to low value remains within the construction area and adverse changes to similar buried remains in a 1km area around the permanent infrastructure from temporary and permanent changes to local hydrogeological regimes OR more limited effects on remains of medium value	The route passes over a number of different watercourses and paleoenvironmental remains will be present, but the extent and significance of these is unknown.	Historic Environment
ENV5C	Minimise loss to non-designated historic landscapes	Professional judgement, based on Historic England's guidance on the establishing the significance of heritage assets	G	Extensive scale of loss or extensive changes to low value non-designated historic landscapes within the construction area and extensive changes to the setting of the same resource outside the permanent infrastructure OR more limited effects on non-designated historic landscapes of medium value	There are no non-designated historic landscapes along the route option alignment.	Historic Environment
ENV5D	Minimise loss of non-designated archaeological remains	Professional judgement, incorporating the use of the IEMA's Principles of Cultural Heritage Assessment in the UK and the Chartered Institute for Archaeologists standard and guidance document for desk based assessment	A	Permanent infrastructure and construction area will result in the loss and / permanent damage to non-designated buried and extant archaeological remains worthy of regional significance which can only be partially mitigated through preservation by record	The known archaeological resource along this route option is not fully known given a lack of formal archaeological investigation. The known remains associated with the Wiltshire-Berkshire Canal are of regional heritage value and will be severed by this option.	Historic Environment
ENV6A	Minimise loss of fluvial flood storage within Flood Zone 2 or 3	Measure using GIS	A	Site is within flood zone 2 and 3 but loss of storage is minor or mitigation is available	Option is not considered to have a significant impact on fluvial flood risk, 10,048m2 area of road is sited within flood zones but sufficient space has been provided for Replacement Floodplain Storage along the watercourse diversions.	Flood Risk
ENV6B	Minimise impacts of pluvial flood risk.	Expert judgement	G	No predicted impacts on pluvial flood risk	Option is not considered to have a significant impact on pluvial flood risk as it is a single carriageway. The options are considered to score similarly against this criteria.	Flood Risk
ENV6C	Minimise impacts of groundwater flood risk.	Checking existing national and local records	G	No predicted impacts on groundwater flood risk	Option is not considered to have a significant impact on groundwater flood risk. The options are considered to score similarly against this criteria.	Flood Risk
ENV7A	Minimise disturbance of potentially contaminated land	Checking existing national and local records	G	Minimal or no disturbance of contaminated land unlikely to cause cost or program implications or harm to potential receptors. No remediation required	There are unlikely to be contamination sources within 250m of this option This layout is partially outside of the boundary used in the Gate 2 EAR. IS THIS AN ISSUE?	Land
ENV7B	Minimise disturbance of potentially contaminated land specifically in relation to authorised and historic landfills	Checking existing national and local records	G	Not within authorised and historic landfills or previous industrial sites or within 250m of authorised and historic landfills or previous industrial sites	There is no authorised or historical landfill within 250m of this option	Land
ENV8	Minimise disturbance of land with known potential for Unexploded Ordnance (UXO)	Checking existing national and local records	A	Disturbance of a low quantity of UXO which can be easily managed / remediated. Unlikely to have significant cost or program implications	A pre-desk study assessment from Zetica acquired for gate 2 identified various potential UXO risks across the SESRO area, therefore, recommend a detailed UXO survey of the area.	Land
ENV9A	Minimise loss of terrestrial priority habitats (use narrative to describe type and quantum)	Use of aerial imagery, MAGIC maps and Professional Judgement	A	Priority habitat directly impacted but mitigation feasible	Construction of the road will require the removal of Deciduous Woodland and Hedgerows which are both listed as Priority habitats.	Biodiversity and Nature Conservation
ENV9B	Minimise loss of aquatic priority habitats (use narrative to describe type and quantum)	Professional judgement based on knowledge of Water Framework Directive.	A	Priority habitat directly impacted but mitigation feasible	Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the any WFD waterbody to reduce potential impacts.	Aquatic Environment
ENV10A	Reduce effects on North Wessex Downs Area of Outstanding Natural Beauty (AONB) and its setting	Professional judgement.	R	AONB and its setting likely to be affected. Effect is likely to be significant.	The introduction of traffic, highway infrastructure and lighting into the generally rural and undeveloped landscape south of the GWR Main Line (with the exception of one solar farm), would interrupt the mostly intact small-scale field pattern divided by hedgerows and woodland belts, which currently contributes positively to the local landscape character and setting of the North Wessex Downs AONB. Effect on landscape character and tranquillity of AONB potentially significant. While mitigation planting could help to reduce effects to some extent, intervisibility between the AONB and new traffic and highway infrastructure would likely remain due to the more elevated nature of the AONB, even if the highway is in cutting for part of the route. Residual effects of the highway on the AONB would be worse than the existing Steventon/Hanney Road which it would replace, due to the closer proximity to the AONB and the presence of lighting at night.	Landscape & Visual
ENV10B	Reduce effects on local landscape character	Professional judgement.	R	Effect on local landscape character is likely to be significant.	The introduction of traffic, highway infrastructure and lighting into the generally rural and undeveloped landscape south of the GWR Main Line (with the exception of one solar farm), would interrupt the mostly intact small-scale field pattern divided by hedgerows and woodland belts, which currently contributes positively to the local landscape character. Therefore the local landscape character and levels of tranquillity (also affected by noise) would be eroded. Although mitigation planting could help to reduce the residual long term effect, it would potentially remain significant due to the introduction of traffic, highway infrastructure and lighting within the generally undeveloped landscape.	Landscape & Visual
ENV11A	Reduce effects on panoramic views from national trail, open access land and important viewpoints in AONB	Professional judgement.	R	Effect on panoramic views from national trail, open access land and important viewpoints in AONB likely to be significant.	Traffic and highway infrastructure would be visible in some panoramic views from The Ridgeway National Trail and would introduce infrastructure into views of the generally undeveloped landscape between the AONB and the GWR Main Line. While mitigation planting could help to reduce effects to some extent, the traffic and highway infrastructure on the new highway would likely be more visible in such panoramic views than it is on the existing Steventon/Hanney Road which it would replace. Given the very high sensitivity of users of the national trail, effects may remain significant in the long term.	Landscape & Visual

ENV11B	Reduce effects on sensitive local visual receptors	Professional judgement.	R	Effect on local views of sensitive visual receptors likely to be significant.	Traffic and highway infrastructure would be visible in views from a large number of local PRoWs, in direct views from some isolated residential properties and from the eastern edge of Grove and southern edge of Steventon. Effect on most views could be reduced in the long term, but some significant effects may remain, including effects at night due to the presence of lighting.	Landscape & Visual
ENV12	Minimise disturbance/encroachment into Air Quality Management Area (AQMA)	Based on an understanding of the scale and nature of activities, air quality management areas (AQMAs) were identified in close proximity to the proposed works.	G	Site is located further than 1km from AQMA OR no construction traffic must go through an AQMA	Marcham AQMA is approximately 6.2 km NNE of Road C at its closest point. The anticipated construction and operational activities would likely lead to a negligible change in air quality.	Air Quality
ENV13	Minimise disturbance/encroachment into Groundwater Source Protection Zone (SPZ)	Magic maps	G	Site is within Zone 3 or not within a SPZ	Site is not within an SPZ.	Aquatic Environment
ENV14A	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Cow Common Brook and Portobello Ditch' WFD waterbody (GB106039023360) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - The route has multiple crossings on the Cow Common Brook and Portobello Ditch WFD waterbody and it's contributing tributaries. Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14B	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ock and tributaries (Land Brook confluence to Thames)' WFD waterbody (GB106039023430) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14C	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Thames (Evenlode to Thame)' WFD waterbody (GB106039030334) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14D	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Sandford Brook (source to Ock)' WFD waterbody (GB106039023410) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14E	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Childrey Brook and Norbrook at Common' WFD waterbody (GB106039023380) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment
ENV14F	Option does not affect Water Framework Directive (WFD) Quality Elements within the 'Ginge Brook and Mill Brook' WFD waterbody (GB106039023660) to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	A	Moderate adverse impacts likely; low risk to ability to attain Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - The route has multiple crossings on the Gingle Brook and Mill Brook WFD waterbody and it's contributing tributaries. Any impacts to the hydrological, ecological and/or geomorphological functioning of river will need to be mitigated for appropriately. A clear span, bridge should be considered on the principal WFD waterbody (blue line) to reduce potential impacts.	Aquatic Environment
ENV14G	Option does not affect Water Framework Directive (WFD) Quality Elements within one of WFD waterbodies downstream of the River Thame to a degree that there is a risk of deterioration; or compromise the ability to attain Water Framework Directive objectives. These WFD waterbodies include: - Thames Wallingford to Caversham - WFD waterbody GB106039030331 - Thames (Reading to Cookham) - WFD waterbody GB106039023233 - Thames (Cookham to Egham) - WFD waterbody GB106039023231 - Thames (Egham to Teddington) - WFD waterbody GB106039023232	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Minor adverse impacts likely; no risk to attaining Water Framework Directive objectives for this waterbody	**No risk of WFD deterioration** - This waterbody is not directly impacted by the proposed road.	Aquatic Environment

ENV15A	Maximise potential for future environmental benefits (terrestrial), e.g. increase tree planting	Professional Judgement	G	Site allows substantial additional environmental benefits to be realised	Being a predominantly arable landscape there is plenty of opportunity for environmental enhancement through the planting of trees and creation of habitats with high distinctiveness. Also opportunity for the creation of wetland areas including wet woodland and ponds.	Biodiversity and nature conservation
ENV15B	Maximise potential for future environmental benefits (aquatic), e.g. increase wetlands area	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Site allows substantial additional environmental benefits to be realised	Connectivity through the watercourse and associated wetlands is crucial. Thus any road crossings will need to consider this appropriately and mitigation provided.	Aquatic Environment
ENV16	Maximise flexibility in routing diverted watercourses so their habitats can be of sufficiently high quality to contribute to catchment Water Framework Directive objectives	Professional judgement based on knowledge of Water Framework Directive and Biodiversity Net Gain legislation	G	Site allows significant flexibility in routing watercourses / Good or high quality habitat options are available	Road crossings need to ensure sufficient light and connectivity through the structure. Preference is a clear span, bridge on all crossings of principal WFD waterbodies (blue line) but an appropriately sized box culvert is acceptable on other watercourses in the WFD catchment. Pipe crossings will be deemed to be unacceptable and should be avoided.	Aquatic Environment
ENV17	Minimise disturbance/encroachment into Local Geological Sites (LGS)	Checking existing national and local records	G	Site is located more than 250m from LGS	No LGS present	Biodiversity and nature conservation
ENV18A	Minimise impacts associated with Noise and Vibration as a consequence of the construction of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment. Red band distance is from works site/road to the SOAEL+5dB, and Amber distance is from SOAEL+5dB to the SOAEL. Road Construction: Red 60m, Amber 61-99m, Green 100m. Construction Traffic: Red 40m, Amber 41-184m, Green 185m. Road Const. (bridge construction): Red 75m, Amber 81-124m, Green 125m. (NOTE: No sensitive properties have been identified within 125m of potential piling works at road bridges and significant effects are not anticipated. Distances referenced in the assessment are those measured between the proposed roads and receptors). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis (with >700 extra receptors included, namely at Diversion Road C, which is outside of Gate 2 Study Area).	A	Potential for significant effects but likely to be mitigated if they occur	The closest noise sensitive property is located approximately 90m from Steventon to East Hanney Diversion Road Option C, with six properties between ~90 to 99m from the option. Based on the indicative assessment, a total of 6 properties are predicted to be within the Amber band during construction.	Noise
ENV18B	Minimise impacts associated with Noise and Vibration as a consequence of the operation of the option	Indicative assessment with noise sensitive properties within RAG bands identified based on predicted construction noise levels during Gate 2 assessment (inc. bunding around sidings). Red band is from works site to the SOAEL+5dB distance, and Amber is from SOAEL+5dB distance to the SOAEL. Rail Sidings: Red 675m, Amber 676-1209m, Green 1210m. This is based on worst-case activity, Material Handling, which includes potential for works between 06:00 to 07:00 and was assessed using night-time noise assessment criteria at Gate 2 as a precautionary approach. The noise emission for the activity is based on G2 assumptions, with update made following review by Costain (JB 05Jun). Professional judgement used in assigning a single RAG rating for each option under review, which includes a review of the number of properties in each band and how close they are located to the RAG boundaries. Property counts do not consider screening of receptors by nearby buildings, screening at second row of properties by first row of properties. This will result in a precautionary assessment of noise impacts. NOTES: buildings to be demolished are excluded from assessment, RAG bands based on assessment approach for residential properties but all NV sensitive receptors identified at Gate 2 are included in analysis.	A	Potential significant effects but likely to be mitigated if they occur	The closest noise sensitive property is located approximately 90m from Steventon to East Hanney Diversion Road Option C, with nine properties between ~90 to 114m from the option. Based on the indicative assessment, a total of nine properties are predicted to be within the Amber band due to operational traffic noise.	Noise
ENV19A	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the construction of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	There are between 10 - 100 high sensitivity receptors (i.e. dwellings) within 350 m of the Road C route with the closest being <80 m away. There are between 1 -10 medium sensitivity receptors (i.e. places of work) within 350 m of the Road C route. Construction activities include the route (rural two-lane carriageway approximately 7.2 km) with a potential cycle / footway and a total of nine culverts and bridges. Demolition of Hill Farm Solar Park would also be required. It is considered that there are no proposed dust-generating construction activities that could not be managed using normal good practices (IAQM construction dust guidance, 2016) to prevent significant effects at any off-site receptor. Given that relatively low numbers of plant and items of machinery would be used and the anticipated number of construction traffic, the potential effects would likely lead to a negligible change in air quality.	Air Quality
ENV19B	Minimise impacts associated with Air Quality including dust, smell, fumes and smoke as a consequence of the operation of the option	Based on an understanding of the scale and nature of activities, sensitive receptors were identified in close proximity to the proposed works.	G	Based on the on the scale of the activities and number, proximity and sensitivity of nearby sensitive receptors (including the nearby Marcham AQMA), the potential for a significant effect is unlikely / air quality impacts are negligible. An appropriate level of mitigation may still be required to reduce risk of impacts occurring.	Road C directs traffic away from Steventon and based on the 2021 Traffic Flow Data (see 405335-T4-02 Movement Strategy Report) and anticipated tourism, the likely AADT is such that the potential effects from vehicle emissions would likely lead to a negligible change in air quality at nearby receptors.	Air Quality

ENV20A	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the construction of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Construction activities would lead to noticeable changes to the visual amenity of the local community on the north-eastern fringe of Grove and southern fringe of Steventon, in part due to lighting during occasional night-time construction works.	Landscape & Visual
ENV20B	Minimise impacts associated with Visual Amenity including light pollution, as a consequence of the operation of the option	Professional judgement.	A	Noticeable changes to visual amenity of local community	Traffic and highway infrastructure associated with the proposed Steventon/Hanney Road would lead to noticeable changes to the visual amenity of the local community on the north-eastern fringe of Grove and southern fringe of Steventon. The effect on day-time visual amenity could in general be reduced in the long term with planting mitigation. Effect of lighting at night likely to be barely perceptible in context of existing light pollution associated with the A338 on the eastern edge of Grove, but likely to be noticeable from the southern fringe of Steventon due to the absence of street lighting to the south of the GWR Main Line.	Landscape & Visual
ENV21A	Minimise impacts associated with solid discharge during construction.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road construction likely to be readily controlled using standard construction mitigation	Pollution
ENV21B	Minimise impacts associated with solid discharge during operation.	NA	G	Impacts unlikely, or adverse impacts likely to be mitigated if they occur	Spillages of solids and sediment in runoff from road operation likely to be readily controlled using standard mitigation	Pollution
Community and Planning Considerations						
CPC1	Distance to the nearest property that will stay during construction (metres)	GIS	R	Less than 250m from the nearest property	200m to nearest property	Socio-Economic
CPC2	Minimise impacts on local community during construction associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	G	Community access/use of community assets is not disrupted during construction	The construction of the new Steventon Road C is likely to cause potential closure or delays to the A388 outside Grove and the A4130. Road closures or delays around Steventon Hill are likely to cause no severance between residents and community assets. Closures or delays on the A338 is likely to cause severance for those who live north of the proposed new road. At worst reduced access to the village may make it harder for those travelling to school and hospital. The proposed option would also cut through and cause severance of multiple PRoWs. However, with most of these routes located away from residential areas the potential affect is likely to be minimal.	Socio-Economic
CPC3	Minimise impacts on local community during operation associated with disturbances of community assets such as schools, hospitals, GP surgeries, schools, libraries, youth centres, Country Parks, allotments, green open spaces and disruptions to recreation	GIS analysis of footprint, community assets, and links with residences.	G	Community access/use of community assets is not disrupted during operation	The operation of the option would cause severance for PRoWs. However, these paths are not in close proximity to residential areas and don't link critical community assets.	Socio-Economic
CPC4A	Are public rights of way (PRoW) disrupted or adversely affected?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Recreational resources / rights of way of local importance are disrupted or affected. The site is likely to affect public rights of way	The operation of the option would cause severance for PRoWs. However, these paths are not in close proximity to residential areas and don't link critical community assets.	Socio-Economic
CPC4B	Are there opportunities to create or improve linkages of Public Rights of Way (PRoW) and recreational routes?	GIS analysis of PRoW, open spaces, cycle routes, canals and other forms of regional or nationally important receptors (eg National Cycle Routes).	A	Links to a recreational resource / right of way of local importance can be enhanced	The construction and operation of the option would cause severance for PRoWs. Access to the Wiltshire and Berkshire canal path could be improved.	Socio-Economic
CPC5	Maximise potential opportunity for recreational benefits	GIS analysis of PRoW, open spaces, cycle routes, canals, other forms of regional/nationally important receptors (eg National Cycle Routes), and community assets.	A	Option allows some additional recreational benefits to be realised	The construction and operation of the option would cause severance for PRoWs. Access to the Wiltshire and Berkshire canal path could be improved.	Socio-Economic
CPC6	Support the realisation of socio-economic incentives on SESRO, including employment, skills, tourism, sustainable travel, connecting people with nature and environmental education	GIS analysis of footprint, community assets, private residents, and businesses. Also awareness of overall project objectives is needed to conclude if the designs align with these.	A	Site supports some of the social-economic incentives of the overall scheme	The road will have minimal negative impacts on community assets and therefore minimal disruption during both construction and operation phases.	Socio-Economic
CPC7	Minimise overall SESRO Order Limits extent and land acquisition, without compromising SESRO needs and project benefits	Spatial comparison of land that would likely be included in the DCO Order Limits, including construction working areas, access and highways or PRoW interactions.	R	Requires substantially greater Order Limits extent	Lies outside of the SESRO safeguarded area currently assigned in the VoWHDC Local Plan and is also the furthest from the reservoir footprint, requiring the greatest additional Order Limits extent to accommodate the new road corridor and junctions south of the mainline railway which otherwise is unlikely to be required for SESRO construction or operation.	Consenting
CPC8	Aim for consistency with published and (insofar as possible) emerging Local Plan land use allocations	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in existing and any emerging Local Plan documents and any Supplementary Planning Documents.	G	Low or no impact	Lies outside of the SESRO safeguarded area (CP14 and CP14a). The eastern end of Road C enters land safeguarded for transport schemes in the South East Vale sub-area (CP18), specifically land for improvements to Featherbed Land and Steventon Junction. This is in order to provide relief to the road network at Rowstock and Harwell, which Road C could help with by offering an alternative route to Grove/Wantage. This remains the same for the consultation draft Joint Local Plan 2041. No land use allocation conflicts with the Oxfordshire County Council Minerals and Waste Local Plans. Not within the area of the South Oxfordshire District Council Local Plan.	Consenting
CPC9	Aim for consistency with any adopted Neighbourhood Plan policy applicable to the land area affected	Spatial comparison of allocated sites and other policy areas, and review of policy wording, in any made Neighbourhood Plan.	G	Low or no impact	Lies outside of East Hanney and Steventon Neighbourhood Plan areas and within the Grove, Ardington and Lockinge areas. No plans are available for these parishes.	Consenting
CPC10	Avoid development of infrastructure within specifically designated areas or their setting, as applicable (e.g. Green Belt, AONB, Common Land, Open Space)	Spatial comparison with designated sites, their settings, and the nature of development works expected.	G	Does not require development of above-ground infrastructure within these designations or development likely to have more than a negligible effect on the setting (where applicable)	Not located within a specifically designated area, such as Green Belt, AONB, Common Land or Open Space.	Consenting

CPC11	Avoid encroachment on any safeguarded land in minerals and waste policy, unless the minerals can be beneficially utilised as a result	Spatial comparison of allocated sites and review of policy wording in existing and any emerging Waste and Minerals Local Plan documents.	G	Low or no impact	Not located in minerals safeguarding area or on a site allocated for minerals or waste uses.	Consenting
CPC12	Ability to integrate with existing nationally-significant infrastructure, statutory undertakers' major infrastructure, or any proposed future Nationally Significant Infrastructure Projects (NSIP) (such as that of National Highways, Environment Agency, Network Rail)	Review of NSIP projects on PINS's register; review of Network Rail and National Highways investment plans; spatial review of statutory undertakers' assets.	G	Low or no interaction with existing infrastructure or proposed Nationally Significant Infrastructure Project (NSIP)	No NSIPs currently registered. No known proposals from Network Rail or National Highways. The National Highways RIS3 Investment Plan will be published in 2024 which will detail the A34 improvement project. Existing gas, HV mains and potable water lines cross Road C.	Consenting
CPC13	Minimise the consenting complexity due to the need for additional consents and licenses that may be required outside the Development Consent Order (DCO), e.g. additional Flood Risk Activity Permit, Environmental Permit, abstraction/discharge Licence, European protected species licence, etc	Review of the nature of expected development works against the list of other consents and licenses developed at Gateway 2.	A	One or more additional consent/license required	Road C crosses over multiple PRoW and so a Temporary Traffic Regulation Order may be required, although this can potentially be included within the DCO application. A section 278 highways agreement, street works notice and highway works permit will also likely be necessary, although could also be included within the DCO. Additional Flood Risk Activity Permit or exemption may be required.	Consenting
CPC14	Avoid or minimise the need for any consequential development consenting (i.e. displacement or alteration of other development)	Review of existing development within the likely land-take, its nature and scale.	G	No existing development requires planning permission to relocate or alter	The road C route avoids an existing 32 ha, 14.8 MW solar farm (which may be temporarily affected by dust during construction of the road but would not be expected to require relocation). It also passes through land used for Truck Festival and so this may need to be relocated during construction or permanently. It is unlikely that festival relocation itself would require planning consent (assuming it has a duration of no more than 28 days and is therefore permitted development) but a revised event licence and potentially consents for associated work (e.g. access road, other hardstanding, advertising or similar) could be required.	Consenting
CPC15	Minimise interfaces/reliance on external governing/third parties (e.g. Removing the canal removes a stakeholder, reducing interfaces and permissions required from Network Rail, National Highways, National Grid)	Review GIS layers for services against the options. Expert Judgement.	R	Multiple complex interfaces with others may complicate or delay progress	Stakeholders involved include: small local businesses, Network Rail, National Highways England, National Grid, local solar farm. Options A and B1 score better than B2 and C due to interactions with overhead lines and water.	Consenting
CPC17	The option provides economic benefits by directing traffic through local town centres which will boost their footfall and potential for people to stop and utilise their local economy	Expert judgement	R	The routes for this option provide a bypass to local towns, which while reducing traffic for local villages, will mean that potential customers of local businesses will not be encouraged to shop in these towns. Therefore, the local economy of these local towns and villages will not benefit from this option	Moves the east-west route away from Steventon and Hanney to Grove and the Milton Interchange/Didcot.	Transport Planning
CPC18	Influence the location and layout of development to maximise the use and value of existing and planned sustainable transport investment	Expert judgement	R	Option does not support existing and planned public transport infrastructure between key destinations	Makes the east-west movement longer for buses and requires a specific facility to turn buses around in Steventon. This route runs parallel to Reading Road.	Transport Planning
CPC19	Maximise the benefits of travel for non-motorised users between key destinations	Expert judgement	A	Provides some routes that would encourage some users to walk, cycle or use bridleways but could be improved further to prioritise a modal shift away from trips undertaken by private vehicles	The road alignment will enable the provision of ped/cycle facilities in the form of a shared route. An equestrian path could also be provided if the need for one is identified.	Transport Planning
Property & Land Acquisition						
PRP1	Minimise loss of sensitive properties, i.e. residential, commercial, green belt, common land, historical or community assets due to project delivery	Review Land allocation mapping on ArcGIS.	R	Permanent loss of sensitive properties	Land is agricultural land. However, this option includes additional agricultural land requirements outside of the safeguarded project area. For this assessment, this has also been considered as sesnitive.	Property & Land Acquisition
PRP2	Minimise loss of land allocated within the Local Plan for alternative higher value / social / cultural value uses, e.g, residential, historical or community assets due project delivery	Review Land allocation mapping on ArcGIS.	A	Temporary loss of allocated land for higher value or social value properties	Road option C does not immediately impact on residential planning permission. However, this option includes additional agricultural land requirements outside of the safeguarded project area which is used by the local community for local events.	Property & Land Acquisition
PRP3	Minimise permanent loss of best and most versatile agricultural land (grades 1, 2 and 3)	Review of agricultural grading layer on ArcGIS, based on 2019 Provisional Agricultural Land Classification	A	Results in loss of any Grade 2 agricultural land or >50% Grade 3 agricultural land	Agricultural land approximate percentage: grade 2 = 6% grade 3 = 52% grade 4 = 42%	Property & Land Acquisition
PRP4	Assessment of Land and Property asset costs and associated compensation due under the Compensation Code	Review of land use / designation on ArcGIS	G	Land acquisition costs likely to be relatively low.	Agricultural land values can range from £8,000 - 14,000 in the area. Landowners may be eligible for Severance claims depending on design and farm practices.	Property & Land Acquisition
PRP5	Assessment of Special Category Landowners (SCLs), utility infrastructure, national asset protection agencies and Crown bodies	Review of affected landowners	A	Nature and number of SCL is medium / low and may represent delivery risks	No SCLOs. But a statutory Landowner and sensitive Land owner. Statutory: Church commisioners for England. Sensitive landowner: Oxford University	Property & Land Acquisition
PRP6	Minimise disruptions of landowners access to their land required for temporary works	Review location in conjunction with existing road network	G	Landowners able to access their land during construction and operation phases	Landowners able to access their land during construction and operation phases.	Property & Land Acquisition

Appendix I A415 to SESRO Road Crossing Sections

A415 to SESRO - Road A - CentreLine

8 crossings

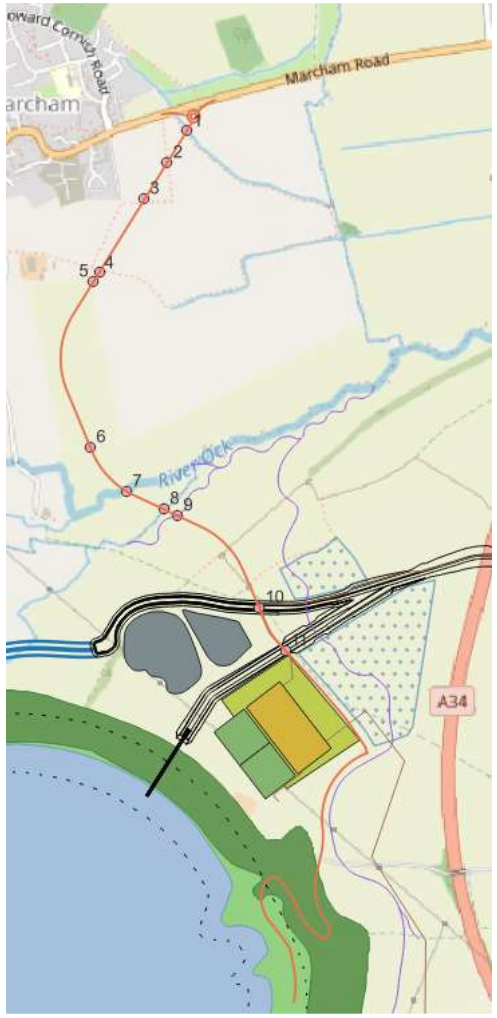
Most likely 4 bridges at point 1, 5,6,7

A415 to SESRO - Road B - CentreLine

7 crossings

Most likely 3 bridges at points 5,6,7

A415 to SESRO - Road C - CentreLine



11 crossings

Most likely 3 bridges at points 7,10,11

A415 to SESRO - Road D - CentreLine

7 crossings

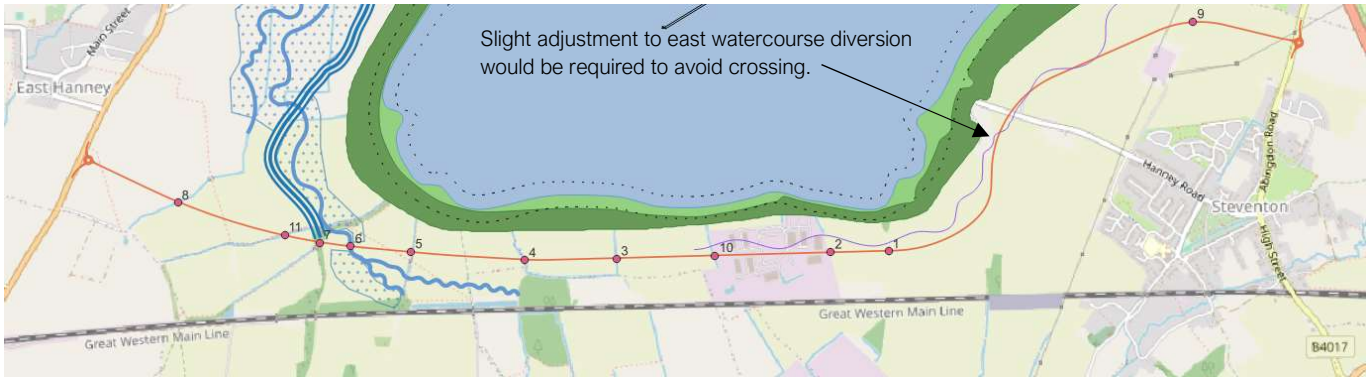
Most likely 3 bridges at points, 4,6,7

Appendix J Steventon to East Hanney Diversion Road Crossing Sections

Alignment A

10 crossings

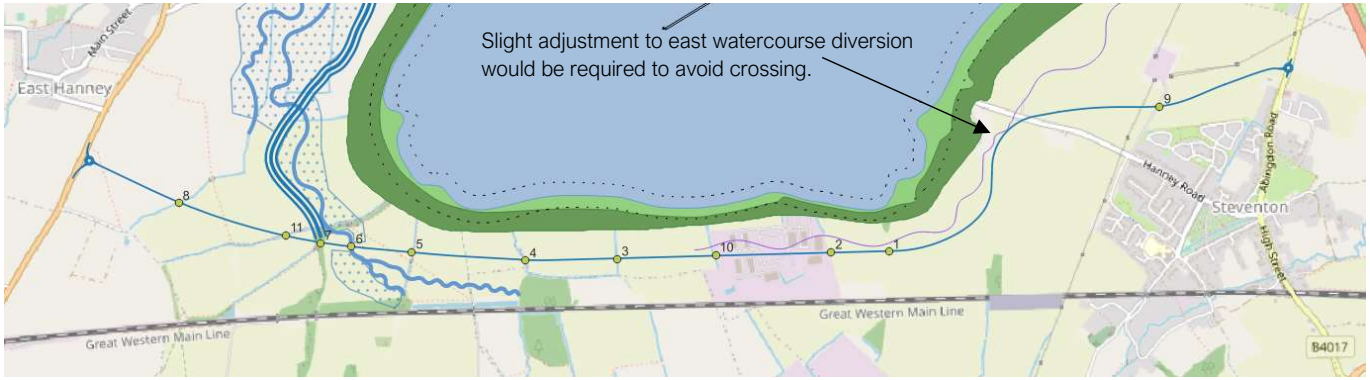
Most likely 4 bridges at points 6,7,8,10



Alignment B1

11 crossings

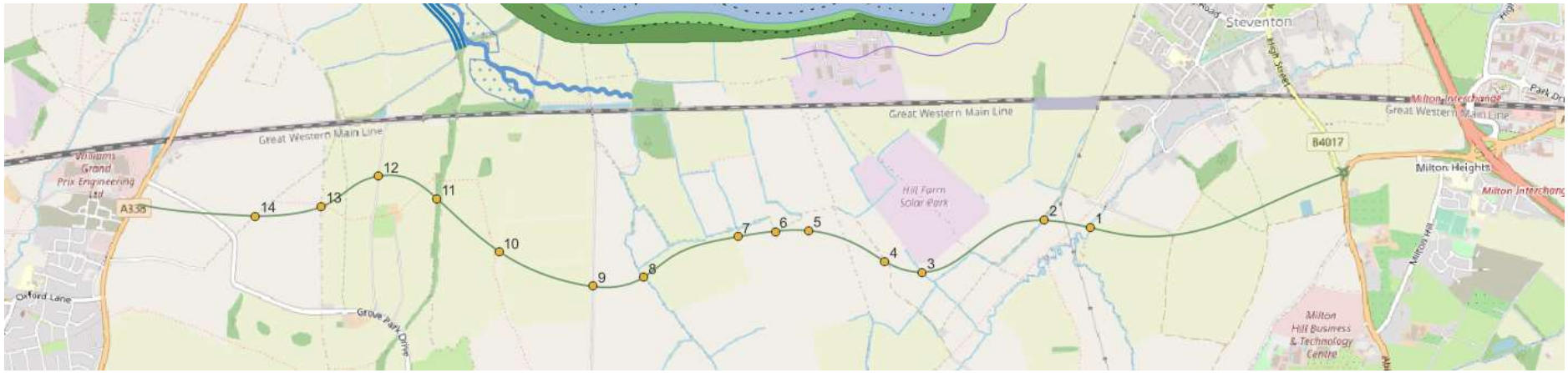
Most likely 5 bridges at points 6,7,11,8,9



Alignment B2

11 crossings

Most likely 5 bridges at points 6,7,11,8,9



Alignment C

14 crossings

Most likely 5 bridges at points 1,2,8,10,11

Appendix K Excluded Criteria

SESRO Access and Diversion Road Options Appraisal - Excluded Criteria

Criteria code	Criteria Description	Theme	Sub-theme	Reason for exclusion
CON2E	Programme - Use of existing assets to reduce the amount of construction required	Constructability	Programme	No differentiator across road options. At the time of the appraisal it is understood that there are no existing assets that could be used to reduce amount of construction requirements for the access road.
CON3D	Logistics - Haulage distance required for construction materials arrival on site to the placement location	Constructability	Logistics	The haulage distance criterion has not been applied to the road options assessment as the access road to the site will also act as the haul road itself. For the Steventon to East Hanney road, the haul road to bring in construction materials will be the access road, where the preferred alingment will the same for each option.
CON5B	3rd Party Impact - Potential to disrupt existing rail network during enabling works and construction	Constructability	3rd Party Impact	No differentiator across road options. None of the routes identified for apprsaisal impact the existing rail network.
OPS7A	Sustainability - Reuse of assets or temporary works for permanent items, e.g. materials storage slab, haulage roads, compound car park	Operability	Operational Resilience	No differentiator across road options. This is not considered to be a significant differentiator at this time with the current level of design detail. As the design progresses this will be considered in more detail, identifying potential reuse opportunities for the preferred routes.
OPS7B	Sustainability - Power required for operation	Operability	Operational Resilience	This is not applicable to the appraisal of road alignments as there is no significant power required during operation.
ENV22A	Minimise impacts associated with liquid discharge during construction,.	Environment	Pollution	This is not applicable to the appraisal of road alignments as there is no liquid discharge.
ENV22B	Minimise impacts associated with liquid discharge during operation.	Environment	Pollution	This is not applicable to the appraisal of road alignments as there is no liquid discharge.
CPC16	Potential for contribution to long-term infrastructure aims	Community & Planning	Consenting	The potential contribution to long-term infrastructure aims is considered to be adequately considered under other applied criteria within the community, planning and land theme.

Affinity Water

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