A358 Taunton to Southfields Dualling Scheme

Preliminary Environmental Information Report - Chapter 10 Material Assets and Waste

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10.1 Introduction

10.1.1 This chapter assesses the potential impacts on the use of material assets and the generation, disposal and recovery of waste arising from the construction and operation of the A358 Taunton to Southfields Dualling Scheme (the 'proposed scheme') following the methodology set out in the Design Manual for Roads and Bridges (DMRB) LA 110 *Material assets and waste* [1].

10.1.2 This chapter details the methodology followed for the preliminary assessment, summarises the regulatory and policy framework related to material assets and waste, and describes the existing environment in the area surrounding the proposed scheme. Following this, the design, mitigation and residual effects of the proposed scheme are discussed, along with the limitations of the assessment.

10.1.3 Material assets and waste are defined in DMRB LA 110 *Material assets and waste* [1] as comprising:

- the consumption of materials and products (from primary, recycled or secondary, and renewable sources), the use of materials offering sustainability benefits, and the use of excavated and other arisings that fall within the scope of waste exemption criteria
- the production and disposal of waste

10.1.4 The preliminary assessment presented in this chapter reports on the construction phase and first year of operational activities.

10.1.5 The effects of the proposed scheme in terms of geology and soils, and the potential for land contamination, have been addressed in Chapter 9 Geology and Soils of this Preliminary Environmental Information (PEI) Report, and the effects on climate have been addressed in Chapter 14 Climate.

10.1.6 The effects associated with the transportation of materials are scoped in, however these are assessed separately in Chapter 5 Air quality, Chapter 11 Noise and vibration and Chapter 14 Climate.

10.2 Legislative and policy framework

10.2.1 As discussed in Chapter 1 Introduction, the primary basis for deciding whether to grant a Development Consent Order (DCO) is the *National Policy Statement for National Networks* [2] (NPSNN), which sets out policies to guide how DCO applications are decided and how the effects of national networks infrastructure should be considered. Table 10-1 identifies the NPSNN policies relevant to the material assets and waste assessment and then specifies where in the chapter information is provided to address the policy.

Table 10-1 Relevant NPSNN policies for the material assets and waste assessment

Relevant NPSNN paragraph	Requirement of the NPSNN	Where in the chapter is information provided to address this policy?
Paragraph 5.42	'The applicant should set out the arrangements that are proposed for managing any waste produced. The arrangements described should include information on the proposed waste recovery and disposal system	The anticipated waste arrangements proposed for construction and operation are detailed in Section 10.8. Estimates of waste generated is outlined in Table 10-9. Section 10.8 outlines how the proposed

Relevant NPSNN paragraph	Requirement of the NPSNN	Where in the chapter is information provided to address this policy?
	for all waste generated by the development. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that the alternative is the best overall environmental outcome.'	scheme would re-use as much material as possible on-site should it be assessed as being suitable for re-use. Section 10.8 also details the design, mitigation and enhancement measures that would be implemented during the design and construction phases.
Paragraph 5.43	'The Secretary of State should consider the extent to which the applicant has proposed an effective process that will be followed to ensure effective management of hazardous and non-hazardous waste arising from the construction and operation of the proposed development. The Secretary of State should be satisfied that the process sets out: • any such waste will be properly managed, both on-site and off-site. • the waste from the proposed facility can be dealt with appropriately by the waste infrastructure which is, or is likely to be, available. Such waste arisings should not have an adverse effect on the capacity of existing waste management facilities to deal with other waste arisings in the area; • adequate steps have been taken to minimise the volume of waste arisings, and of the volume of waste arisings sent to disposal, except where an alternative is the most sustainable outcome overall.'	On-site and off-site waste management arrangements, targets and contractor performance are detailed in the Section 10.8. The estimated volumes of hazardous and non-hazardous waste arising from construction have been forecast in Table 10-9 and compared with the local, regional and national waste infrastructure capacity. Available local recovery and disposal sites were evaluated against a suite of sustainability criteria in Section 10.9. This has demonstrated that sufficient capacity exists within the existing regional waste infrastructure.
Paragraph 5.169	'Applicants should safeguard any mineral resources on the proposed site as far as possible.'	A Mineral Safeguarding Assessment has been undertaken to understand the potential for extractable minerals to be present within the proposed scheme area. The Somerset County Council (SCC) Minerals Plan [3] does not show any Mineral Safeguarding Areas within the proposed scheme area. In addition, there are no peat resources located within the proposed scheme area.
Paragraph 5.182	'Where a proposed development has an impact on a Mineral Safeguarding Area (MSA), the Secretary of State should ensure that the applicant has put forward appropriate mitigation measures to safeguard mineral resources.'	

Legislation

The Waste and Environmental Permitting etc (Legislative Functions and Amendment etc) (EU Exit) Regulations 2020

10.2.2 *The Waste and Environmental Permitting etc (Legislative Functions and Amendment etc) (EU Exit) Regulations 2020* [4] ensure that waste and environmental permitting regimes continued to operate effectively at the end of the EU transition period.

Waste (England and Wales) Regulations 2011

10.2.3 The *Waste (England and Wales) Regulations 2011 (S.I. 2011 No. 988)* [5] includes measures taken before a substance, material or product has become a waste that reduce:

- the quantity of waste, including through re-use of products or the extension of the life span of products
- the adverse impacts of generated waste on the environment and human health
- the content of harmful substances in materials and products

10.2.4 The Waste (England and Wales) Regulations 2011 implement much of the EU Waste Framework Directive 2008/98/EC ("the Directive") that provided the overarching legislative framework for the collection, transport, recovery and disposal of waste within the EU. In addition, the Waste and Environmental Permitting etc. (Legislative Functions and Amendments etc.) (EU Exit) Regulations 2020 [4] set out how articles 5 and 6 of the Directive should be read now that the transition period has ended. In addition, the definition of waste remains as '*any substance or object which the holder discards or intends or is required to discard'*, with the term 'discard' including the disposal, recovery or recycling of a substance.

10.2.5 Waste for disposal is classed as hazardous, non-hazardous or inert, depending on the level of harm to human health and/or the environment. Once a material has become waste, it remains waste until it has been fully recovered and no longer poses a potential threat to the environment or human health, at which point it is no longer subject to the controls and measures required by the Directive. The Directive also sets out measures to protect the environment and human health by preventing or reducing the adverse effects of the generation and management of waste, by improving the efficiency of resource use, and reducing the overall impacts.

10.2.6 The Waste (England and Wales) Regulations 2011 also mandate the waste hierarchy, which requires that where waste is unavoidable, products and materials should, subject to regulatory controls, be used again, for the same or a different purpose (re-use). Otherwise, assets should be recovered from waste through recycling. Value can also be recovered by generating energy from waste, but only if none of the above offer an appropriate alternative solution. The waste hierarchy is summarised in Table 10-2 below.

Table 10-2 The waste hierarchy

Stages	Includes
Prevention	Using less material in design and manufacture. Keeping products for longer; re-use. Using less hazardous material.
Preparing for re-use and re-use	Checking, cleaning, repairing, refurbishing, whole items or spare parts.
Recycling	Turning waste into a new substance or product. Includes composting if it meets quality protocols.
Other recovery	Includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling operations.
Disposal	Landfill and incineration without energy recovery.

Environmental Permitting (England and Wales Regulations) 2016

10.2.7 The objective of the *Environmental Permitting (England and Wales) Regulations 2016* [6] is to supplement the requirements of the Waste (England and Wales) Regulations 2011 and prevent or reduce as far as possible the negative effects of landfilling on the environment and any resultant risks to human health. It sets out requirements for the locations, management, engineering, closure and monitoring of landfills.

10.2.8 Furthermore, the requirements of the EU Landfill Directive 1999/31/EC [7] were transposed into UK national legislation through The Landfill (England and Wales) Regulations 2002 and subsequently re-transposed as part of The Environmental Permitting (England and Wales) Regulations 2016 [4]. This aims to prevent or reduce negative effects on the environment from the landfilling of waste, as far as possible, and introduces technical requirements for waste and landfills as a disposal option through:

- setting minimum standards for the location, design, construction and operation of landfills
- setting targets for the diversion of Biodegradable Municipal Waste from landfill
- controlling the nature of waste accepted for landfill
- defining the different categories of waste (hazardous waste, non-hazardous waste and inert waste)

10.2.9 The Environmental Permitting (England and Wales) Regulations 2016 [4] applies to all landfills, which are defined as waste disposal sites for the deposit of waste onto or into land.

Waste Minimisation Act 1998

10.2.10 The purpose of this Act [8] is to give power to certain local authorities to take steps to minimise the generation of waste in their area and for related purposes.

Further legislation

10.2.11 There are a number of primary legislative instruments in the UK on waste that enact a wide range of secondary legislation that governs the storage, collection, treatment and disposal of waste. These include:

- *The Environmental Protection Act 1990* [9]
- *The Environment Act 1995* [10]
- *The Finance Act 1996* [11]
- *The Waste and Emissions Trading Act 2003* [12]
- *The Clean Neighbourhoods and Environment Act 2005* [13]
- *The Waste (Circular Economy) (Amendment) Regulations* [14]

Aggregates Levy

10.2.12 The *Aggregates Levy* [15] is intended to encourage a shift in demand from primary aggregates towards alternative materials such as recycled aggregate. This is a tax on sand, gravel and rock that has either been excavated from the ground, dredged from the sea in UK waters or imported. HM Revenue and Customs (HMRC) are notified every quarter on how much aggregate has been produced or sold and there is a levy of £2 per tonne of sand, gravel or rock [16].

The Waste (Circular Economy) (Amendment) Regulations

10.2.13 The UK began to implement the Circular Economy Package (CEP) on 1 October 2020. Amendments contained in the *Waste (Circular Economy) (Amendment) Regulations* [14] will see the CEP implemented in England and Wales, and partially in Scotland and Northern Ireland.

10.2.14 The CEP is mainly focused on increasing resource efficiency, aiming to make sure that fewer resources are sent to landfill when they could be reused or recycled instead. Moving towards a circular economy will result in an optimisation of resources and also increase a product's life. Some companies across the UK have already begun to implement their own circular economy policies, which focus on bringing resources back into the company once a product has reached its end-of-life so that parts can be reused or repurposed for new products.

10.2.15 Now the CEP is being fully introduced in law via a series of minor and technical amendments. Although the legislative framework for the CEP lies in European Law, the UK is still fully committed to ensure that it is properly implemented in its own domestic laws. The amendments aim to:

- Specify when a separate collection of waste is not necessary.
- Ensure any waste collected separately that can be prepared for reuse or recycling is not incinerated or landfilled.
- Introduce an environmental permit condition on waste incinerators and landfills which restrict waste (paper, metal, plastic and glass), which is collected separately for re-use or recycling, from being accepted for incineration or landfill.
- Make sure unlawfully mixed hazardous waste is separated wherever technically feasible.
- Prohibit the mixing of waste oils where the mixing would prevent the regeneration or recycling of the oil delivering an equivalent or better environmental outcome.
- Require relevant waste operators, operating under a registered waste exemption, to record, retain and submit information on hazardous waste and the products and materials resulting from the treatment of that waste.

National planning policy

National Policy Statement for National Networks (NPSNN) (2014)

10.2.16 The *NPSNN* [17] requires that evidence of appropriate mitigation measures (incorporating engineering plans on the configuration and layout of the proposed scheme and use of materials) during both design and construction needs to be presented, together with the arrangements for managing any wastes that are produced. It specifically states at paragraph 5.42 that:

'*The applicant should set out the arrangements that are proposed for managing any waste produced. The arrangements described should include information on the proposed waste recovery and disposal system for all waste generated by the development. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that the alternative is the best overall environmental outcome*.'

10.2.17 The *NPSNN* identifies that government policy on waste is intended to protect the environment and human heath by producing less and using it as a resource wherever possible. Where this is not possible, the *NPSNN* identifies that waste

management regulation ensures that the waste hierarchy is utilised, and that waste is disposed of in a way that is least damaging to the environment and to human health. This includes consideration of the ability for the waste from the development to be dealt with appropriately by waste infrastructure, without having an adverse effect on the capacity of existing waste management facilities to deal with other waste arisings in the area.

National Planning Policy for Waste (2014)

10.2.18 The *National Planning Policy* for Waste [18] sets out the national planning policy on waste and provides the planning framework to enable local authorities to put forward, through waste local plans, strategies that identify sites and areas suitable for new or enhanced facilities to meet the waste management needs of their areas. This plan details waste planning policies for England and has been considered in conjunction with the *National Planning Policy Framework* (NPPF) [19], the *Waste Management Plan for England* [20] and *National Policy Statements for Waste Water* [21] *and Hazardous Waste* [22].

National Planning Policy Framework (2021)

10.2.19 The *NPPF* [19] set out the government's planning policies for England. It does not contain specific materials or waste management policies; however, the framework includes reference to waste management by advocating that waste minimisation forms part of the environmental objective role of achieving sustainable development.

Waste Management Plan for England (2021)

10.2.20 The Department for Environment, Food and Rural Affairs published the *Waste Management Plan for* England in January 2021 [20]. The plan provides an overview of waste management in England. The plan does not introduce new policies or change how waste is managed in England. Its aim is to bring current waste management policies together under one national plan. It fulfils the requirements of the *Waste (England and Wales) Regulations 2011* for the waste management plan to be reviewed every six years.

10.2.21 The plan also includes changes to waste management plan requirements which have been made by the *Waste (Circular Economy) (Amendment) Regulations 2020* [14] where these could be incorporated into the Plan.

10.2.22 The plan also includes changes to any authority's waste management plan requirements which have been brought about by the Waste (Circular Economy) (Amendment) Regulations 2020.

Local planning policy

Somerset Waste Core Strategy: Development Plan Document up to 2028

10.2.23 The *Somerset Waste Core Strategy* [23] guides Somerset County Council's (SCC's) approach to planning for sustainable waste management in Somerset until the year 2028. It covers all forms of waste including household, commercial, industrial and construction waste.

10.2.24 *WCS1 Waste Prevention*: this policy states that SCC, as Waste Planning Authority, will work with local residents, businesses and other partners to maximise the scope for waste prevention.

10.2.25 For proposed development, SCC will work with local planning authorities to promote and require the following supporting information to be submitted with planning applications:

- A site waste management statement for the construction of minor developments (less than 10 dwellings or where the floorspace to be created by the development is less than 1,000m^2).
- A Site Waste Management Plan (SWMP) for the construction of 10 or more dwellings or where the floor space to be created by the development is 1,000m^2 or more.
- A site waste management strategy for the construction of large-scale major projects (200 or more dwellings or where the development covers more than 10,000m^2) or for multi-site projects within the same application.

10.2.26 On completion of development, the documents listed above will support the Somerset Waste Partnership in its work on waste minimisation including, but not limited to, the delivery of its municipal waste management strategy and its work with the supply chain to reduce the negative impacts of packaging.

10.2.27 *WCS2 Recycling and Reuse*: this policy states that planning permission will be granted for waste management development that will maximise reuse and/or recycling of waste subject to the applicant demonstrating that the proposed development will, in particular, be in accordance with Development Management Policies 1-9.

10.2.28 *WCS3 Other Recovery*: this policy states that planning permission will be granted for proposed waste management development that will maximise other recovery from waste, subject to the applicant demonstrating that the proposed development:

- will not treat waste that could viably be recycled or composted
- will facilitate the recovery of energy from waste
- will, in particular, be in accordance with Development Management Policies 1-9

Standards and guidance

10.2.29 The assessment of the environmental effects associated with the use of material assets and the disposal or recovery of waste related to the construction of the proposed scheme has been undertaken in accordance with DMRB LA 110 *Material assets and waste* [1].

10.2.30 Reference has also been made to the following:

- DMRB LA 101 *Introduction to environmental assessment* [24]
- DMRB LA 104 *Environmental assessment and monitoring* [25]
- The Definition of Waste: Development Industry Code of Practice, Version Two (Contaminated Land: Applications in Real Environments (CL:AIRE)) [26]

<u>Highways England Sustainable Development Strategy (2017)</u>

10.2.31 The *Highways England Sustainable Development Strategy* [27] sets out Highways England's approach and priorities for sustainable development to their key stakeholders. The strategy outlines several ambitions relating to financial capital (climate change adaptation), human capital (sustainability leadership), natural capital (carbon management), social capital (responsible sourcing), and

manufactured capital (circular economy). Of these ambitions, the following are of relevance to this assessment:

- *"We will more actively manage our carbon emissions: we will examine and focus on new business areas where efficiencies can be achieved through reducing fuel, energy and raw material consumption, and waste generation."*
- *"We will increase our knowledge of where all goods or materials are sourced from… ensuring we responsibly source materials is essential, as their production and handling can have local, national and global impacts - on human and social health and also on the environment and climate change."*
- *"We will push towards a circular approach to our management of resources: minimising our demand for primary resources extracted from the ground and maximise the reuse of the resource is already in use on the network. Reutilising them in as higher value function as possible."*

10.3 Assessment methodology

10.3.1 This section sets out the methodologies that have been employed to undertake the material assets and waste assessment, with reference to published standards, guidelines and best practise.

10.3.2 The assessment of the environmental effects associated with the use of material assets and the disposal or recovery of waste resulting from the construction of the proposed scheme have been undertaken in accordance with DMRB LA 110 *Material assets and waste* [1], alongside the use of professional judgement and emerging best practise.

Method of establishing baseline conditions

10.3.3 The existing baseline conditions have been identified as receptors which have the potential to be impacted by the proposed scheme. This includes the source of materials required for the construction of the proposed scheme, and waste management facilities which may be used for the treatment or disposal of waste. The baseline conditions have been informed by desk-based studies, including (but not limited to) data from:

- the Environment Agency
- SCC
- authorities in the wider regional area of South-West of England, including Cornwall, Devon, Dorset, Bristol, Wiltshire and Gloucestershire
- South West Aggregates Working Party (SWAWP)
- local development policies and topic papers

10.3.4 To identify the baseline conditions, data has also been collected from Highways England and members of the design team on the materials that are likely to be used during each stage of the proposed scheme and the waste that is likely to arise.

Assessment of construction impacts

10.3.5 For the purposes of assessing the material assets, a preliminary assessment has been undertaken based on current buildability advice. In accordance with DMRB LA 110 *Material assets and waste* [1], the assessment of environmental effects associated with the consumption of material assets resulting from construction has considered the proposed scheme design relating to:

- the types and quantities of materials required for the project

- information on materials that contain secondary or recycled content.
- information on any known sustainability credentials of materials to be consumed
- the type and volume of materials that would be recovered from off-site sources for use in the project
- the cut and fill balance
- details of on-site storage and stockpiling arrangements, and any supporting logistical details

10.3.6 In accordance with DMRB LA 110 *Material assets and waste* [1], the assessment of environmental effects associated with the production and disposal of waste resulting from the construction of the proposed scheme is a quantitative exercise which identifies the following:

- The amount of waste (by weight) that will be recovered or diverted from landfill either on-site or off-site (i.e. for use on other projects).
- The types and quantities of waste arising from the project (demolition, excavation arisings and remediation) requiring disposal to landfill.
- Details of on-site storage and segregation arrangements for waste and any supporting logistical arrangements; and potential for generation of hazardous waste (type and quantity).

10.3.7 The receptors that have been considered by this preliminary assessment have been included in Table 10-3.

Table 10-3 Receptors considered in the materials chapter

Receptor	Description
Material resources	Availability and depletion of material resources
Local designated Mineral Safeguarding Areas (MSA)	The SCC Minerals Plan [3] does not show any MSAs within the proposed scheme area.
Peat deposits	There are no peat resources located within the proposed scheme area.
Waste management facilities and landfill sites	Use of waste management facilities or permanent reduction of landfill capacity

Assessment criteria

10.3.8 DMRB LA 110 *Material assets and waste* [1] defines a specific methodology for assessing the environmental significance of a material resource or for determining the magnitude of the impact on such resource. The significance of the material assets or waste within the study area is determined on the basis of the descriptions described in Table 3-13 of DMRB LA 110 *Material assets and waste* [1], reproduced in Table 10-4.

Table 10-4 Significance category descriptions

Significance	Description
Very large	Material assets • No criteria: use criteria for large categories. Waste

Significance	Description
	• >1% reduction or alteration in national capacity of landfill, as a result of accommodating waste from a project. • Construction of new (permanent) waste infrastructure is required to accommodate waste from a project.
Large	Material assets • Project achieves <70% overall material recovery/recycling (by weight) of non-hazardous construction and demolition waste (CDW) to substitute the use of primary materials. • Aggregates required to be imported to site comprise <1% re-used/recycled content. • Project sterilises ≥1 mineral safeguarding site and/or peat resource. Waste • >1% reduction in the regional capacity of landfill as a result of accommodating waste from a project. • >50% of project waste for disposal outside of the region.
Moderate	Material assets • Project achieves less than 70% overall material recovery/recycling (by weight) of non-hazardous CDW to substitute the use of primary materials. • Aggregates required to be imported to site comprise re-used/recycled content below the relevant regional percentage target. Waste • >1% reduction or alteration in the regional capacity of landfill as a result of accommodating waste from a project. • 1-50% of project waste for disposal outside of the region.
Slight	Material assets • Project achieves 70 - 99% overall material recovery/recycling (by weight) of non-hazardous CDW to substitute use of primary materials. • Aggregates required to be imported to site comprise re-used/recycled content in line with the relevant regional percentage target. Waste • ≤1% reduction or alteration in the regional capacity of landfill. • Waste infrastructure has sufficient capacity to accommodate waste from a project, without compromising the integrity of the receiving infrastructure (design life or capacity) within the region.
Neutral	Material assets • Project achieves >99% overall material recovery/recycling (by weight) of non-hazardous CDW to substitute the use of primary materials. • Aggregates required to be imported to site comprise >99% re-used/recycled content. Waste • No reduction or alteration in the capacity of waste infrastructure within the region.

Note: 'Region' means the local authority/authorities comprising the second study area.

Note: 'Primary materials': Materials that are from a non-renewable source (also referred to as 'virgin' materials.).

Note: 'Peat resource': existing or potential peat extraction sites.

10.3.9 Table 10-5 outlines the approach for determining significance, incorporating professional judgement by the competent expert.

Table 10-5 Significance criteria for material assets and waste

Significance category	Description
Significant (one or more criteria met)	Material assets • Category description met for moderate or large effect. Waste • Category description met for moderate, large or very large effect.
Not significant	Material assets • Category description met for neutral or slight effect. Waste • Category description met for neutral or slight effect.

Note: Where projects have a material surplus, re-use/recycling of material can be achieved by use on other sites in line with sustainability principles and the CL:AIRE Definition of Waste Code of Practice ISBN 978-1-905046-23-2 [26]

10.4 Assessment assumptions and limitations

10.4.1 The information provided within this chapter is considered to provide an appropriate level based on the assessment methodology outlined in DMRB LA 110 *Material assets and waste* [1].

10.4.2 The assessment for material assets and waste receptors has been based on a review of publicly available information, presented within Appendix 10.1 Material Assets and Waste Baseline, at the time of undertaking the assessment. Whilst the baseline data sources used in this assessment have been obtained from the most recently available information, it is still possible that conditions could have changed since their publication. Consultation will be undertaken with SCC to obtain the most recent information held on the capacity of waste management infrastructure to inform the Environmental Statement (ES).

10.4.3 Construction of the proposed scheme would be carried out in accordance with industry standard good working practice, which will be outlined in the Environmental Management Plan (EMP) to be submitted as part of the DCO application. This will include the environmental measures that would be adopted during the construction phase.

10.4.4 Given the early stages of design, estimates relating to the quantity of primary and secondary materials required are not available, nor are there estimates available relating to the quantity of waste arisings anticipated, sources of materials and mode of transport for materials and waste. As such, a high-level assessment has been carried out at this stage, limited to identifying activities that are likely to require significant quantities of materials, or are likely to produce significant quantities of waste. Values have been estimated based on the proposed scheme design. However, the assessment has been conducted within the limits of deviation (LoD) outlined in Chapter 2 The Project. Variations within the LoD could result in minor changes to the quantities of material assets required and estimated waste arisings to construct the proposed scheme. It is considered unlikely that the localised alignment changes permitted by the LoD would have a significant effect on material volumes. Therefore, the proposed LoD would not

give rise to any materially new or materially worse adverse environmental effects from those reported in this chapter.

10.4.5 Indicative cut and fill volumes for the proposed scheme are provided in Table 10-8. These volumes have been estimated based on the latest design information available and are likely to change as the design of the proposed scheme evolves. Therefore, the estimated cut and fill volumes will be reviewed and updated to inform the assessment for the ES. An overview of the gaps and uncertainties is provided in Table 10-6.

Table 10-6 Gaps and uncertainties

Gaps and uncertainties	Description
Confirmation of types and quantities of materials required for the proposed scheme and estimated waste arisings	To be developed pending further ground investigation.
Earthworks strategy including management of excess material.	To be developed as part of the Environmental Impact Assessment. Potential opportunity for reuse on local projects
Off-site material sources and suppliers.	To be confirmed by the contractor at detailed design stage.
Measures for transporting materials and waste to and from site including any access or haul roads.	To be confirmed by the contractor at detailed design stage.
Measures incorporated into the design to ensure sustainable use of resources and minimisation of waste arisings.	The EMP will include a SWMP. Proposals for the handling of waste material will be in accordance with the CL:AIRE Definition of Waste Code of Practice [26].
Whether any invasive species would need to be removed from site.	An Invasive Species Management Plan will be produced as part of the EMP.

10.4.6 The maintenance works would be carried out in accordance with the Maintenance and Repair Strategy Statement that will be submitted as part of the DCO application. DMRB LA 110 *Material assets and waste* [1] requires that environmental assessment for material assets and waste should only report on the first year of operational activities (opening year) in addition to the construction phase. It is not anticipated that any significant maintenance activities should occur during the first year of operational activity and therefore, no significant material asset use or waste generation should arise.

10.5 Study area

10.5.1 The material assets and waste assessment has been undertaken in line with DMRB LA 110 *Material assets and waste* [1] for the following study areas:

- The first study area is based on the construction footprint and project boundary (red line) of the proposed scheme (including compounds and temporary land take), this constitutes the area within which construction materials would be consumed (used, re-used and recycled) and waste would be generated.
- The second study area covers an area sufficient to identify feasible sources and availability of construction materials typically required for road schemes, and suitable waste infrastructure that could accept arisings of waste generated by the proposed scheme. The second study area encompasses the county of Somerset and includes the waste infrastructure that is suitable (licensed for waste volume and type) to accept arisings and/or waste generated by the

project. However, given the extent of waste infrastructure within the county, consideration has also been given to the possible need to use facilities over the wider South-West region (Cornwall, Devon, Dorset, Bristol, Wiltshire and Gloucestershire). As indicated within DMRB LA 110 *Material assets and waste* [1], professional judgement has been used to provide consideration on a balance of the proximity principle and value for money principle for establishing the second study area.

10.5.2 Based on DMRB LA 110 *Material assets and waste* [1], it is outside the scope of the assessment to consider the indirect environmental effects associated with the extraction of raw materials from their original source and the manufacture of products which occur off-site. This stage of a material's lifecycle is likely to have already been subject to an environmental assessment. These effects are therefore not addressed in this chapter.

10.6 Baseline conditions

10.6.1 The baseline environment is comprised of receptors which have been identified based on the likely impacts set out in DMRB LA 110 *Material assets and waste* [1]. A review of relevant information sources has been undertaken to establish existing and future baseline data and current understanding with regards to materials impacts. A summary is provided in the following paragraphs, with more detailed information in Appendix 10.1 Material Assets and Waste Baseline.

Material assets

10.6.2 The proposed scheme would require both primary raw materials, such as aggregates and soil, and manufactured construction materials such as concrete, asphalt and steel.

10.6.3 The SCC Local Aggregate Assessment (LAA) (second revision 2017) for 2006 - 2015 indicates that Somerset remains a major producer of crushed rock aggregates and has sufficient permitted reserves to maintain a steady and adequate supply of crushed rock.

10.6.4 The LAA also indicates that Mineral Planning Authorities for Somerset, Devon and Cornwall have signed a Memorandum of Understanding that provides a mechanism for sharing data and maintaining a joint sand and gravel landbank (with a significant contribution from Devon).

10.6.5 The Devon LAA for 2009 - 2018 [28] indicates that landbanks for land-won aggregates remain above the minimum levels required by the NPPF [19] and provides for up to 9.2 million tonnes of sand and gravel at two sites. The *Somerset Minerals Plan Development Plan Document up to 2030* (adopted 2015) [3] estimates that the potential capacity of existing facilities for recycled and secondary aggregates in Somerset is over 160,000 tonnes per year. However, the Minerals Plan considers this figure to be an under-estimate and that it does not fully represent the potential supply of secondary and recycled aggregate.

10.6.6 The SCC Minerals Plan [3] does not show any MSAs within the proposed scheme area. The nearest is for building stone to the east of Stoke St Mary, approximately 400m to the west/south-west of the proposed scheme. The SCC Mineral and Waste Development Framework – Minerals Topic Paper 6 for MSAs indicates that this MSA is designated for Blue Lias bedrock.

10.6.7 There are no peat resources located within the proposed scheme study area.

Waste

10.6.8 Environment Agency Waste Data Interrogator [29] data for the South-West indicates that 1,573,000 tonnes of waste were received/handled in Somerset in 2019, with 20,390,000 tonnes in the South-West region. Environment Agency records relating to landfill inputs in Somerset for 2019 indicate that 484,000 tonnes of waste were accepted by landfills in Somerset and 3,211,000 tonnes in the South-West region. However, the remaining landfill capacities for Somerset and the South-West Region in 2019 were 2,017,000 and 25,038,000 tonnes, respectively. The Waste Management Data Interrogator 2019 [29] shows that hazardous waste (merchant) capacity in the South-West region is all located in Gloucestershire (Wingmoor Landfill Site – GL52 4DG) and Wiltshire (Parkgate Farm Hazardous Waste Landfill – SN5 4HG), which are both located approximately 90 miles from the proposed scheme.

10.6.9 The Environment Agency Waste Data Interrogator [29] data indicates there is no remaining inert waste capacity in Somerset and only 2,017,000m^3 of non-hazardous waste capacity (including non-hazardous sites with stable non-reactive hazardous waste capacity. However, there was 11,494,000m^3 of inert waste capacity within the overall South-West region in 2019.

10.6.10 The Environment Agency Waste Data Interrogator [29] indicates there were three permitted non-hazardous landfills in Somerset and 26 in the wider South-West region in 2019.

Future baseline

10.6.11 Chapter 4 Environmental assessment methodology sets out the ‘Do Minimum’ and ‘Do Something’ scenarios. The ‘Do Minimum’ scenario represents the future baseline with minimal interventions and without new infrastructure. Potential changes to future material asset and waste receptors would not be noticeable to those identified in the baseline text above. Therefore, the future baseline would remain the same as set out above.

10.7 Potential impacts

10.7.1 There is potential for the following impacts relating to material assets and waste arising to occur during construction of the proposed scheme:

- Impacts on-site generated materials (e.g. soils) and waste arisings have on the existing capacity of landfill
- Impacts on primary (i.e. non-recycled) material resources used for construction

10.7.2 Mitigation measures are being incorporated in the design and construction of the proposed scheme, which are set out in Section 10.8. The potential impacts on material assets and waste are outlined below in relation to construction and operation.

Construction impacts

10.7.3 Construction of the proposed scheme will require the use of materials such as aggregates from primary, secondary and recycled sources, along with manufactured construction products, which can include road surfacing, retaining walls, pre-cast elements for the construction of structures such as bridges, gantries and signage, barriers, lighting and fencing. However, some of the

material could be generated on-site, for example excavated soils or recycling of concrete for use as aggregate from existing structures.

10.7.4 Construction is expected to result in potentially significant volumes of surplus materials and waste, leading to potential impacts on the available waste management infrastructure (in particular through the permanent use of landfill void space). Waste would predominantly arise from excavations and demolition of existing structures, and also from materials brought to site that may be damaged, off cuts and / or surplus.

Construction compounds

10.7.5 The location of the construction compounds has been selected to be local to works to be carried out and near haul roads, to prevent pollution, reduce waste and to encourage ease of use. The selection of locations has also taken into account environmental considerations including the potential for leakage and contamination. Such environmental considerations will be described in the EMP. Storage of any suspected contaminated material prior to treatment or disposal off-site would be in a designated, bunded area on an impermeable surface, in line with the requirements that will be set up in the EMP and submitted as part of the DCO application. Material will be tested prior to reuse or off-site disposal.

10.7.6 There will be two construction compounds comprising one main compound and a second compound for material processing (including stockpiles and a crusher) and stockpiling. The main compound will be located at chainage 0+100, located in the fields adjacent to the westbound carriageway.

10.7.7 To reduce the distance between the major excavation area and the location where the material would be processed, the material processing (crusher) and material stockpile compound would be located in the fields south of the new alignment of the A358 between Ch 2+300 and Ch 2+600. To facilitate movement of material to and from this compound, and to reduce the amount of construction traffic using the existing road network, haul routes would be created. Where practicable, these are likely to be routed along or immediately adjacent to the proposed mainline route; however, where this is not practicable, additional temporary land use may be required adjacent to the works to enable access to the local roads network.

10.7.8 Satellite compounds for the construction of junctions and local road overbridge and underbridges will be located at the following locations:

- Stoke Road overbridge
- Mattock's Tree Green junction overbridge
- Griffin Lane underbridge
- Bickenhall Lane overbridge
- Village Road link (south) overbridge
- Ashill junction overbridge
- Southfields roundabout

Material asset impacts

Material assets required

10.7.9 Material assets required for the construction of road schemes include both primary raw materials, such as aggregates and minerals, and secondary

manufactured products. Many material assets would originate off-site and some, such as excavated soils and rock, would arise on-site.

10.7.10 The production, sourcing, transport, handling, storage and use of these materials, as well as the disposal of any surplus (where necessary), have the potential to adversely affect the environment.

10.7.11 The consumption of material assets has the potential to result in direct and indirect impacts on the environment. For material asset use, the potential environmental effects are associated with the sourcing of primary raw materials and secondary products, and their subsequent use during construction. There are also potential environmental effects associated with site won material, such as the requirement to store and possibly process any materials during construction.

Earthworks

10.7.12 Construction of the proposed scheme would generate earthworks material, including cut (excavation of material removed from an area) and fill (placement of material into an area to make, for example, embankments).

10.7.13 The proposed scheme has the potential to have an impact on the waste management capacity in the South-West region, depending on the balance of the cut and fill.

Mineral resource areas and MSAs

10.7.14 The SCC Minerals Plan [3] does not show any MSAs within the proposed scheme area. Therefore, the proposed scheme does not have the potential to impact on any MSA. In addition, there are no peat resources located within the proposed scheme area.

Waste impacts

10.7.15 In considering waste impacts, it is important to define when, under current legislation and understanding, a material is considered to be a waste. The definition of waste is important because the classification of substances as waste is the basis for the formulation of waste management and the application of controls to protect the environment and human health with respect to waste.

10.7.16 With regards to this assessment, the material excavated and re-used within the proposed scheme area should not be classified as waste, subject to it meeting requirements such being suitable for its intended use as earthwork embankments and landscaping.

Waste arisings

10.7.17 For waste materials, the potential environmental impacts are associated with the production, storage, processing and ultimate disposal of waste arisings from the proposed scheme to alternative sites or landfill during construction.

10.7.18 The types and quantities of waste generated during construction, demolition and excavation activities would vary in their impact depending on the management route opportunities (re-use, off-site recycling, off-site composting or off-site recovery) and the potential recovery rate.

10.7.19 In terms of potentially hazardous waste arisings, sources of contamination within the proposed scheme boundary have been considered. There are no authorised or historical landfills within the first study area. However, as indicated in Chapter 9 Geology and soils, there may be potential contamination risks from general

highway use and agricultural land use, which could be encountered during the construction phase including tar bound road planings from existing highways. For more information on the potential contamination risks see Chapter 9 Geology and soils.

Waste management infrastructure

10.7.20 The proposed scheme has the potential to generate large amounts of construction, demolition and excavation waste, which may affect the capacity of Somerset and the wider South-West region's waste management infrastructure. This is due to the need to occupy landfill space, limiting the short-term use of available waste storage and the potential to impact the proposed scheme's ability to comply with relevant waste policies and plans.

Operational impacts

10.7.21 Operation of the proposed scheme would result in smaller impacts on material assets and waste to those described above for the construction phase. The design process will seek to minimise the consumption of materials and the generation and disposal of waste throughout the lifecycle of the proposed scheme.

10.7.22 DMRB LA 110 *Material assets and waste* [1] requires that environmental assessment for material assets and waste should only report on the first year of operational activities (opening year), in addition to the construction phase.

10.7.23 Significant effects are considered unlikely during the operation of the proposed scheme, from both the use of material assets and the disposal or recovery of waste. As such, operational impacts have been scoped out of the assessment, on the basis that no likely significant effects would occur within the first year of operation.

10.8 Design, mitigation and enhancement measures

10.8.1 Environmental considerations have influenced the proposed scheme throughout the design development process, from early route options assessment through to refinement of the proposed scheme's design. An iterative process has facilitated design updates and improvements, informed by environmental assessment and input from the proposed scheme's engineering team, stakeholders and public consultation.

10.8.2 The proposed scheme will include a range of environmental commitments. Commitments of relevance to material assets and waste are set out in this section under the following categories:

- Embedded mitigation: measures that form part of the engineering design, developed through the iterative design process.
- Essential mitigation: any additional scheme-specific measures needed to avoid, reduce or offset potential impacts that could otherwise result in effects considered to be significant in the context of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Essential mitigation has been identified by environmental topic specialists, taking into account the embedded and good practice mitigation.
- Enhancement mitigation: any additional scheme-specific measures needed to avoid, reduce or offset potential impacts after the proposed development is complete.

Embedded mitigation

10.8.3 Embedded mitigation involves project design principles adopted to avoid or prevent adverse environmental effects. Embedded mitigation relating to material assets and waste is outlined in Chapter 2 The Project. Such measures are therefore not proposed or reported in this PEI Report as mitigation. However, measures have been developed by applying the five key principles for Designing out Waste as outlined by the Waste and Resources Action Programme (WRAP): A Design Team Guide for Civil Engineering [30], which has been summarised below:

- Design for Reuse and Recovery - this includes the reuse of materials and components recovered from on site or from other sites, use of recycled materials and use of “new” materials that contain a high percentage of recycled material. For example, non-contaminated excavated materials will be reused onsite to achieve a cut and fill balance.
- Design for Off-Site Construction - this includes identifying if any part of the design can be prefabricated / manufactured off-site and assembled on-site rather than constructed in-situ.
- Design for Material Optimisation - consideration should be focussed on using less material and producing less waste; for example, through “lean design” and reducing variables and bespoke elements in materials and design.
- Design for Waste Efficient Procurement – this includes utilising the procurement process of materials and services to inform design development, reducing waste in the supply chain, consideration where waste arises and where waste can be reduced in construction methods.
- Design for Deconstruction and Flexibility - consider maintenance and adaptability for future uses, how constructions can be deconstructed effectively at end of life and avoiding the use of materials that prevent future recycling.

Essential mitigation

10.8.4 The following mitigation measures will be implemented during the design and construction phases of the proposed scheme:

- Waste arisings will be prevented and designed out where practicable.
- Design for re-use, recovery and materials optimisation.
- Confirmation of types and quantities of materials, alongside information on materials that contain secondary and recycled content will be developed following detailed design.
- Opportunities to reuse material resources will be sought.
- Opportunities to support the circular economy will be considered.

10.8.5 An EMP will be prepared in parallel with the development of the proposed scheme design and construction methodology and will include a Materials Management Plan (MMP), and will be submitted as part of the ES to accompany the DCO application. This approach for managing materials is consistent with the waste hierarchy defined in the *Waste Framework Directive (Directive 2008/98/EC)*. Adopting the waste hierarchy would significantly reduce the amount of material requiring off-site disposal and hence reduce potential impacts relating to the movement of materials both on to and off-site.

Materials

10.8.6 A MMP will be prepared prior to construction. The MMP will outline how site won materials would be managed and reused, in accordance with best practice requirements and the controls for material management and storage. This approach for managing materials is consistent with the waste hierarchy defined in England by the Waste (England and Wales) Regulations 2011 (S.I. 2011 No. 988) [31].

10.8.7 In line with the target set out in DMRB LA 110 *Material assets and waste* [1], a minimum of 22% of aggregates used in construction will be recycled or secondary, for those applications where it is technically and economically feasible to substitute these alternative materials for primary aggregates. To facilitate compliance with this target, the contractor will calculate the total aggregate required to achieve the detailed design, and the total where the design specification dictates only primary aggregate is used. During construction, the contractor will record the amount of primary and secondary/recycled aggregate by weight and calculate compliance with the target (offsetting the amount excluded by the design specification).

10.8.8 The contractor will use the Building Research Establishment (BRE) Framework Standard for Responsible Sourcing (BES 6001) [32] to verify that imported materials are sustainably sourced and managed, in order to reduce the environmental impacts throughout the supply chain.

10.8.9 The contractor will be required to review the design and investigate opportunities to standardise (where practicable) construction components to increase efficiency of materials' use in production and reduce waste production. This initiative will be progressed through detail design and documented in a Material Efficiency Design Report submitted to Highways England prior to construction.

Waste

10.8.10 Waste materials may arise due to the nature of the material (e.g. contamination) or the timing of arising. A SWMP will be developed during the design process and form part of the EMP, which will be submitted as part of the DCO application. The SWMP would outline the proposals for the identification, segregation, handling and storage of wastes identified as arising from the proposed scheme.

10.8.11 The EMP will contain measures to ensure that contaminated material is addressed during construction and unacceptable risks are mitigated.

10.8.12 The WRAP and Environment Agency *Quality Protocol: Aggregates from inert was*te [33] will be followed with respect to the production and use of aggregates from inert waste.

10.8.13 In line with the target set out in DMRB LA 110 *Material assets and waste* [1], the proposed scheme will target 70% recycling and reuse on site of suitable, uncontaminated concrete from demolition activities as a substitute for the use of primary material. Where reuse is not practical, recycling and recovery will be the next preferred option. To facilitate this, the contractor will use the methodology in the Waste Framework Directive to demonstrate the recovery of non-hazardous construction waste, with a target of 90%. The contractors will aim to achieve a minimum recovery of 70% (by weight) of non-hazardous construction waste.

10.8.14 It may be necessary to remove some unsuitable and excess materials from site, which could result in impacts on waste management infrastructure and the local road network. When applying the waste hierarchy, measures will be implemented

to ensure the options that deliver compliance with *The Waste (England and Wales) Regulations 2011* are selected to ensure the best environmental outcome.

10.8.15 Waste management measures to be documented in the EMP to minimise the likelihood of any localised impacts of waste on the surrounding environment would comprise:

- damping down of surfaces during spells of dry weather and brushing or water spraying of heavily used site entrances or tracks
- off-site prefabrication, where possible
- burning of waste or unwanted material would not be permitted on-site
- all hazardous material including fuels, chemicals, cleaning agents or solvent products to be kept in sealed containers and stored and managed appropriately
- all contaminated materials encountered on site to be assessed through further ground investigation and site-specific risk assessment to determine the requirement for treatment and potential for re-use (as per Chapter 9 Geology and Soils)
- materials requiring removal from the site would be transported using licensed carriers and records would be kept detailing the types of waste moved

10.8.16 The re-use of excavated materials should be undertaken in accordance with the Contaminated Land: Application in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice [26]. This can also be applied where materials require treatment (including crushing and screening) prior to re-use to meet the required engineering specification.

10.8.17 Where practicable approaches implemented to minimise the quantities of waste requiring disposal would comprise:

- agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme
- implementation of just-in-time material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste
- attention to material quantity requirements to avoid over-ordering and generation of waste materials
- during site clearance and construction, re-use of materials wherever feasible e.g. re-use of excavated soil for earthwork embankments and landscaping
- the materials would be sorted or processed and, where materials excavated on-site are initially unable to meet the re-use criteria, they would either be treated to make them suitable for use or, as a last resort, disposed off-site as waste
- segregation of waste at source, where practical
- the proposed scheme would be designed to maximise the earthworks balance
- re-use of materials within the construction works, for example, the re-use of pavement planings as subbase in footpaths
- re-use and recycling off-site where re-use on-site is not practical

Earthworks

10.8.18 An earthworks surplus of approximately 58,700m^3 has been identified as outlined in Table 10-8. This material is comprised of two types of material: mudstone and limestone. Measures would be taken to reduce this excess material to the point

that no surplus material will remain after the required cut and fill construction operations. These measures include:

- highway alignment changes to reduce cut volumes
- changes to landscape earthworks cross section and slope design to increase placed fill volumes
- changes to cut slope design and cross sections at locations in deep cutting to reduce cut volumes
- utilisation of excavated materials in pavement construction

10.8.19 As the general cut/fill quantities are approximately in balance, there is likely to be a limited volume available for landscaping fill.

10.8.20 The design would incorporate earthworks with the landscape design to mitigate the visual impact of the proposed scheme and integrate it into the surrounding landscape. The offline section would make use of cuttings through the higher ground around Henlade and Mattock's Tree Green. Much of the online section of the route would be close to the general ground level, matching the existing A358 alignment. The new grade-separated junctions would require embankments for the slip roads, connecting local roads and bridges. The amount of landscaping fill available is expected to be very limited and therefore, mitigation measures such as earthworks screening bunds would be restricted to selected locations.

10.8.21 The above measures will be documented in the EMP, which will be submitted as part of the DCO application.

Enhancement

10.8.22 No enhancement measures have been included in the proposed scheme design for materials and waste.

10.9 Assessment of likely significant effects

10.9.1 This section assesses the potential effects of the material assets used and waste generated during construction of the proposed scheme. In accordance with the applied methodology, the assessment of effects has been undertaken based on a reasonably worst-case scenario, one that is precautionary, but it is reasonable to assume could occur, rather than an extreme scenario that is on balance unlikely.

Material assets

10.9.2 Aggregates will need to be imported for construction of the proposed scheme, including pavement, concrete and manufactured products. The regional recycled aggregate target, outlined in Appendix 10.1, states that the recycled content target for alternative materials in the South-West is 22%.

10.9.3 The types of materials required for the construction phase of the proposed scheme are listed in Table 10-7, these would be refined during future detailed design.

Table 10-7 Material assets required

Project activity	Detail of likely material assets required for the proposed scheme	Quantities of material assets required (tonnes)	Additional information on material assets
Fill	General fill, including earth embankments (mainline and local roads) and earthbunds	29,000	Sourced from material won on-site

Project activity	Detail of likely material assets required for the proposed scheme	Quantities of material assets required (tonnes)	Additional information on material assets
	General fill	340,000	Sourced from local suppliers where possible
	General fill, required for landscape	55,000	Sourced from material won on-site
Installation of pavement	Mainline (including sub-base, base, binder course and surface course)	637,000	Potential to re-use site won materials. If not suitable or due to programme requirements, material would be sourced from local suppliers
	Local roads (including sub-base, base, binder course and surface course)	173,000	
	Central reserve (including sub-base, binder course and sub course)	37,000	
	Other concrete pavement, footpaths or maintenance access	5,000	
Installation of manufactured products	Drainage	21,000	Sourced from local suppliers where possible
	Concrete step barrier	17,000	
	Timber post and rail fencing	4,000	
	Steel Vehicle Restrain System and kerbs	1,000	
Structures	Ding Mill culvert extension	500	Local batching plants. Majority of precast factories in the UK are situated in the Midlands. Steel composite likely to be sourced from a national supplier, closest availability would be Somerset or South Wales
	A358 Gas main protection slab	200	
	Ashill junction overbridge	16,000	
	Black Brook tributary culvert 1	2,000	
	Black Brook tributary culvert 2	2,000	
	Cad Brook bridge extension	2,000	
	Ding Bridge eastbound	2,000	
	Fivehead River underbridge	1,000	
	Griffin Lane underbridge eastbound	12,000	
	Hatch Park cattle creep extension	2,000	
	High Bridge underbridge North	2,000	
	M5 junction 25 southbound diverge offside retaining wall	100	
	Mattock's Tree Green junction overbridge	21,000	
	River Tone tributary culvert	2,000	
	Stoke Road overbridge	12,000	
	Sunnyside underpass extension	1,000	
	Venner's Bridge extension	2,000	
	Venner's Bridge (Stewley Link)	2,000	
	Village Road overbridge	26,000	
	West Sedgemoor main drain culvert extension (culvert 1928)	1,000	

Note: Values have been rounded to the nearest 1,000 tonnes.

10.9.4 The proposed scheme has been designed to reduce the quantity of imported construction materials, alongside reducing the quantities of waste taken off-site by re-using or recycling the available existing materials within the proposed scheme.

10.9.5 Following the material re-use assessment, material to be produced on the proposed scheme includes Class 1B and 1C (general fill), Class 2A, 2B, 2C and 2D (cohesive general fill) and Class 4 (landscape fill). The cut and fill and landscaping material assets are likely to be derived from site won material. Re-using Class 1 and 2 fill for embankments and Class 4 material for landscape bunds would reduce the amount of material required to be sourced from off-site.

10.9.6 The contractor will seek to re-use as much site won material as possible, this would be detailed within the MMP.

10.9.7 The proposed scheme would cut into existing topography. Based on preliminary design figures, the excavated material would be used as general fill for earthwork embankments and landscaping. On this basis, it is expected that the proposed scheme would achieve an overall earthworks balance of cut and fill materials, subject to consideration of unacceptable material.

10.9.8 From preliminary design figures, it is predicted that approximately 5,100m^3 (11,000 tonnes) of earthworks material will be classified as contaminated unacceptable U2 material requiring off-site disposal. Therefore, as a percentage of the total cut, the proposed scheme is estimated to have an 99% material earthworks recovery recycling rate based a desk top review of the local geology. Geotechnical investigations are being carried out during this preliminary design stage and further details will be provided in the ES to confirm the material earthworks recovery recycling rate.

10.9.9 The materials required for the installation of the pavement are likely to be imported to site, with the potential to re-use some site won material. Other imported materials related to the installation of manufactured products are likely to be sourced from local, established suppliers who regularly provide materials for similar sized projects.

10.9.10 The contractor will ensure that the suppliers have adequate capacity to meet demand, without having a negative impact on their resources. When identifying the suppliers, the contractor will consider the distance from the proposed scheme to ensure the distance the materials travel is as short as possible, with a preference for sourcing locally to support the local and regional economy.

10.9.11 The proposed scheme has been designed to reduce the quantity of imported construction materials, alongside reducing the quantities of waste taken off-site, by re-using or recycling the available existing materials along the proposed scheme.

10.9.12 Overall, in terms of earthwork material assets, the proposed scheme is predicted to achieve a 99% material recovery recycling rate. Therefore, in line with Table 10-5, the assessment of effects on material assets is slight and therefore not significant. The preliminary scheme cut, fill and surplus quantities which arise from the earthwork figures are outlined in Table 10-8.

Table 10-8 Proposed scheme design earthworks estimates

Description	Cut (m^3)	Fill (m^3)	Surplus (m^3)
Total after topsoil and pavement strip adjustment	731,300	680,300	51,000
Total after acceptability corrections	621,600	680,300	-58,800

10.9.13 As outlined in paragraph 10.8.18, measures will be taken to reduce this excess volume of fill to the point that no surplus material will remain following the cut and fill construction operations.

Imported materials

10.9.14 The proposed scheme is predicted to achieve a 99% earthworks material recovery rate; and material won on-site from excavations is likely to be reused on-site as general fill for embankments and topsoil. Table 10-7 identifies the material assets that would not be able to be sourced on-site and would need to be imported.

10.9.15 The imported manufactured material assets would be sourced from established suppliers who regularly provide materials for similar sized projects. The contractor will determine the suppliers involved in the proposed scheme, ensuring they have adequate resources to meet the quantitative needs of the proposed scheme without having negative influence on their resources.

10.9.16 The SCC LAA (second revision 2017) for 2006 - 2015 states that the countywide landbank for crushed rock in 2015 was 380 million tonnes, equivalent to crushed rock aggregate reserves being able to meet projected demand for 28.4 years. The landbank for all land-won sand and gravel was estimated at 7 million tonnes in 2015, and the remaining landbank was estimated at 12.5 years.

10.9.17 Material would be imported to site in line with the recycled content target for the South-West of 22% by the contractor. Therefore, the assessment of effects on material assets is considered slight and not significant.

Waste

Waste arisings

10.9.18 The main types of waste arisings associated with the construction phase of the proposed scheme and the potential recovery rates are shown in Table 10-9.

Table 10-9 Estimated waste arisings

Project activity	Likely waste from the proposed scheme	Quantity (tonnes)	Quantity (m^3)	Potential management routes	Anticipated Potential Recovery rate (%) [34]
Site remediation, preparation or earthworks	Excavated material		621,600	Suitable material for fill	100%
	Excavated material		109,700	Suitable material for landscape	95%
	Vegetation arising from site clearance	Vegetation has not been included in the modelling at this stage. Quantities will be estimated in the ES.		All assumed to keep and re-use on-site, or undertake off-site composting	100%
Demolition	Asphalt from removal of existing road, some of which may contain coal tar	70	200	Off-site recycling or disposal depending on coal tar content	95%
	Materials from demolition of buildings and structures	300	1,000	Segregated during demolition to allow for off-site recycling or disposal	75%
Construction	Asphalt and bituminous material	10,063	17,000	Off-site recycling or disposal	95%

Project activity	Likely waste from the proposed scheme	Quantity (tonnes)	Quantity (m^3)	Potential management routes	Anticipated Potential Recovery rate (%) [34]
	Concrete (ready mixed)	735	2,000	Off-site recycling or disposal	95%
	Steel	35	300	Off-site recycling or disposal	100%
	Timber	168	500	Off-site recycling or energy recovery	90%
Waste from the compounds	General office waste/construction worker waste	Domestic waste is considered to be minimal		Off-site recycling or disposal	85%
	Packaging from materials delivered to site	Packaging is considered to be minimal		Taken back by suppliers for re-use or recycling, sorted and taken off-site for recycling or disposal	85%
Operation	Typically, highway schemes have a material life span of 20-40 years before maintenance or upgrading is required, dependent on material properties, maintenance and usage. Maintenance would be carried out in accordance with DMRB when the deterioration is judged to affect the standards of the service provided to the road user and the integrity of the pavement structure [35]	Minimal due to the re-use of planed material		This would be managed by Highways England and is likely to consist of a combination of local recycling facilities, disposal at an inert or non-hazardous landfill site	N/A
Total	N/A	1,499,400	752,400	N/A	N/A

Note: Values have been rounded to the nearest 100 or 1,000 tonnes.

10.9.19 Measures would be implemented such that material is handled in accordance with the Waste (England and Wales) Regulations 2011 to ensure the best environmental outcome. The proposed scheme would re-use as much material as possible on-site. A ground investigation will be undertaken to assess material suitability and testing will be undertaken during construction to confirm that excavated materials meet the specification requirements. This would ensure that excavated material can be used directly within the proposed scheme, subject to being suitable for use or following site treatment, in line with the CL:AIRE *Definition of Waste: Development Industry Code of Practice* [26]. Any material that does not meet this specification, or could not be treated to meet the specification, would be disposed of appropriately.

10.9.20 Should hazardous waste be encountered during construction that needs to be removed off-site, this would be handled in specially designated areas in storage

compounds (likely mostly to be at the main compound), prior to transfer to external waste management sites. Non-hazardous materials for removal would be segregated and appropriately re-distributed to alternative projects or transported to waste management facilities.

10.9.21 Construction of the proposed scheme is expected to generate 752,400m^3 (1,499,400 tonnes) of waste arisings of which 621,600m^3 (83% of the total waste) would be re-used on-site and around 124,000m^3 (16% of the total waste) could potentially be recycled off-site. Therefore, the proposed scheme could potentially achieve a diversion from landfill of 99%.

10.9.22 The remaining landfill capacity in the South-West of England in 2019 for all non-hazardous and hazardous waste as determined by the Environment Agency [29] is 25,038,000m^3. Based on a worst-case scenario, whereby all estimated waste arisings generated by the proposed scheme would be disposed of at landfill, it is anticipated this would utilise less than 1% of the South-West's landfill capacity. In practice, a large proportion of waste produced by the proposed scheme would likely be reprocessed or recycled rather than being disposed of in landfill, therefore further reducing the quantities of waste produced.

10.9.23 The proposed scheme is anticipated to account for less than a 1% reduction or alteration in the regional capacity of waste management infrastructure, and there is adequate disposal capacity in the South-West (although in practice, a large amount of this waste would be reprocessed or recycled). Therefore, the assessment of effects on waste arisings would be slight and therefore not significant.

Waste management infrastructure

10.9.24 All materials arising from construction will be managed in accordance with the waste hierarchy defined within *The Waste (England and Wales) Regulations 2011*.

10.9.25 Some site won materials will not be required for re-use on-site and, where this is the case, efforts will be made to reduce the need to export this to local waste management facilities.

10.9.26 Should any asbestos be found on-site during construction, demolition or excavation works, the contractor will treat this as hazardous waste and assess the risk of those materials to ensure that a management system is in place that responds correctly and appropriately to the materials present.

10.9.27 The location of waste management facilities for CDW within the second study area are shown in Figure 10.1 Waste management infrastructure. This figure includes six types of waste infrastructure facility with data gathered from Somerset. The waste management sites comprise composting, waste transfer station, waste treatment station, metal recovery / recycling facilities, incineration facilities and landfill.

10.9.28 Overall, there would be a limited amount of waste that would be removed from site and therefore, it is unlikely that waste would be disposed of outside of the region. Therefore, the assessment of effects on waste management infrastructure is slight and not significant.

Operation effects

10.9.29 The proposed scheme has limited potential to generate significant effects during the first year of operational activities as there are no requirements to import or

export materials or to generate waste on a day-to-day basis. Routine maintenance would include gully emptying, litter collection and periodic maintenance activities including resurfacing. Waste arisings from these maintenance activities would be expected to be equivalent to the existing road and the waste would be managed using the established procedures and facilities that are used across the strategic highways network. During the first year of operational activities, there is not expected to be a requirement for the use and disposal of any significant volume of material, therefore the assessment of effects on waste is neutral, and not significant overall.

10.10 Monitoring

10.10.1 In line with DMRB LA 110 *Material assets and waste* [1], the assessment provides a framework for assessing and managing the effects associated with the use of material assets and the disposal or recovery of waste by promoting:

- Reduction in overall impacts and improvements in the efficiency of resource use.
- Prevention and/or reduction of adverse effects associated with the generation and management of waste.

10.10.2 Procedures will be adopted by the contractor during construction to control the use of materials and further reduce the impact. For example, materials such as soil, concrete and demolition materials will be documented in the MMP. Once a contractor has been appointed, engagement will be undertaken to ensure that environmental permitting requirements are met and solutions are developed to reduce conflict and delays. Materials will be responsibly sourced (i.e. must have a certified provenance, traceability and sustainability), in order to reduce the impact on the highways network and material assets. Responsible sourcing is defined in BS8902 [36] Responsible Sourcing Sector Certification Schemes for Construction Projects – Specification as “the management of sustainable development in the provision or procurement of a product”.

10.10.3 In order to comply with responsible sourcing principles, the contractor will, for example:

- Refer to standard BES 6001 - Responsible Sourcing of Construction Products.
- Ensure suppliers are certified by the Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification (PEFC).

10.10.4 The EMP will set out monitoring to be undertaken during the construction stage to ensure that the mitigation measures embedded in the proposed scheme design are secured and implemented.

10.11 Summary

10.11.1 This chapter has considered the potential environmental effects associated with the use of material assets and disposal and recovery of waste for the proposed scheme, following DMRB LA 110 *Material assets and waste* [1].

Construction assessment

10.11.2 There are no significant effects anticipated during the construction of the proposed scheme.

Operational assessment

10.11.3 There are no significant effects anticipated during operation of the proposed scheme.

Further work

10.11.4 The information presented is preliminary and is based on the proposed scheme, as described in Chapter 2 The Project. The earthworks strategy is to be developed further and has the potential to change following any scheme design changes resulting from consultation feedback.

10.11.5 Further assessment as part of the Environmental Impact Assessment (EIA) process will be undertaken to confirm the scale of environmental impacts and significance of environmental effects arising from the proposed scheme. The final assessment will be reported within the ES, which will accompany the DCO application.

Abbreviations List

Please refer to PEI Report Chapter 17 Abbreviations.

Glossary

Please refer to PEI Report Chapter 18 Glossary.

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