

A303 Amesbury to Berwick Down

TR010025

6.1 Environmental Statement

Chapter 12: Material assets and waste

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

October 2018

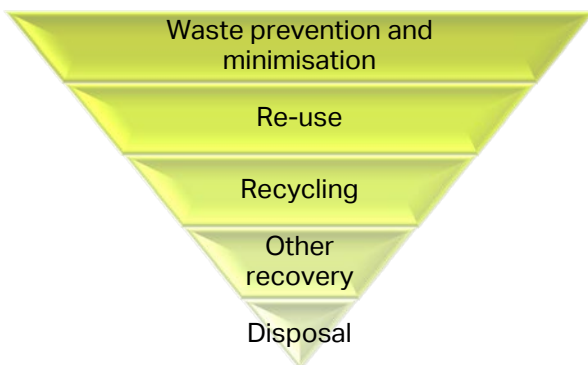


12 Material assets and waste

12.1 Introduction and competent expert evidence

- 12.1.1 This material assets and waste chapter has been written in accordance with IAN 153/11 (Ref 12.1) which is intended for the "identification of impacts associated with materials resource use and waste arisings" for construction, improvement and maintenance projects and is relevant guidance for this Scheme. In addition to this, DMRB HA204/08 (Ref 12.2), HA200/08 (Ref 12.3), and Annex A of IAN 125/15 (Ref 12.4) have also been followed.
- 12.1.2 This chapter describes the material resources and waste arisings assessment for the Scheme.
- 12.1.3 For the purpose of this chapter, materials are defined as comprising:
 - a) The use of material resources; and,
 - b) The generation and management of waste.
- 12.1.4 Material resources are defined by IAN 153/11 (Ref 12.1) as “the materials and construction products required for the construction, improvement and maintenance of the trunk road network. Material resources include primary raw materials such as aggregates and minerals, and manufactured construction products”.
- 12.1.5 Waste is defined as per the Waste Framework Directive (2008/98/EC) (Ref 12.5) as "any substance or object which the holder discards or intends or is required to discard."
- 12.1.6 During construction and operation of the Scheme, the aim would be to prioritise waste prevention, followed by preparing for re-use, recycling, recovery and lastly disposal to landfill as per the internationally recognised waste hierarchy (see Figure 12.1).

Figure 12.1: Waste hierarchy



12.1.7 This chapter of the ES has been prepared by competent experts with relevant and appropriate experience. The technical lead for the materials assessment is Mike Bains, and his professional qualifications and experience are summarised in Appendix 1.1.

12.1 Legislative and policy framework

12.1.8 Chapter 1 Introduction states that the primary basis for deciding whether or not to grant a Development Consent Order (DCO) is the National Policy Statement for National Networks (NPSNN) (Ref 12.6) which, at sections four and five, sets out policies to guide how DCO applications will be decided and how the impacts of national networks infrastructure should be considered. Table 12.1 identifies the NPSNN policy relevant to the material assets and waste assessment and where information is provided in respect of this policy.

Table 12.1: Relevant NPSNN policies for the materials assessment

Relevant NPSNN paragraph reference	Requirement of the National Policy Statement for National Networks (NPSNN)	Where in the ES Chapter is information provided to address this policy.
5.42 and 5.43 (Waste Management)	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.	Estimates of the waste generated, how it would be managed and measures to minimise waste are presented in Table 12.11 and Section 12.7.

12.1.9 In accordance with the NPPF, the NPSNN policies relating to the ‘applicant’s assessment’ are the primary source of policy guidance regarding this assessment. The NPPF was revised in 2018, noting that the requirements which relate to this assessment have been updated. The NPPF (2018, Ref 12.7) has strengthened the requirement that the supply of minerals is conserved, indicating that this is essential. This assessment considers the impact on minerals in Section 12.6.

12.1.10 Other relevant policies, legislation and guidance have been considered as part of the material assets and waste assessment, which have informed the identification of receptors and resources and their sensitivity; the assessment methodology; the potential for significant environmental effects; and required mitigation. These policies are:

- a) The Waste Management Plan for England (Ref 12.8) - fulfils the Waste Framework Directive (WFD) Article 28 mandatory requirements, and other required content as set out in Schedule 1 to the Waste (England and

Wales) Regulations 2011 as amended. The plan is a high level document, which outlines the waste that is generated and how those materials are managed. The Waste Management Plan provides an analysis of current waste management practices in England, and evaluates implementation of the objectives and provisions of the revised WFD. In terms of demolition and construction waste, the plan details how the United Kingdom is committed to meeting its target under the Waste Framework Directive of recovering at least 70% by weight, of construction and demolition waste by 2020.

- b) The National Planning Policy for Waste (2014) (Ref 12.9) - provides the planning framework to enable Local Authorities to put forward, through local waste management plans, strategies that identify sites and areas suitable for new or enhanced facilities to meet the waste management needs of their areas. Information is also included concerning non-waste developments, including any development whose end function is not directly related to waste. Waste developments include: landfills; waste disposal; waste treatment; waste recycling plants; and Household Waste Recycling Centres (HWRCs). The National Planning Policy for Waste (Section 8) states that when determining planning applications for non-waste developments, Local Authorities should ensure that:

“the likely impact of proposed, non-waste related developments on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the Waste Hierarchy and/or the efficient operation of such facilities; and

the handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal.”

The above mentioned statements have informed the assessment methodology and the likely impacts of the Scheme existing waste management facilities, and on sites and areas allocated for waste management are considered.

- c) The National and Regional Guidelines for Aggregates Provision in England 2005 to 2020 (Ref 12.10) sets out revised national and regional guidelines for aggregates provision in England for the period 2005 to 2020, including assumptions on the proportion contribution of alternative sources of aggregate (secondary and recycled aggregates to the overall provision.
- d) Wiltshire and Swindon Waste Core Strategy 2006-2026 (2009) (Ref 12.12) - Policy WCS6 describes the policy relating to waste auditing and recycling. It sets out detailed requirements for residential and commercial developments, but for other developments states that:

“Proposals for the developments identified above must also be accompanied by a waste audit, which must include:

- a) the type and volume of waste that the development process will generate (the development process comprises the construction process and any other operations necessary to bring the development into being);*
- b) the steps to be taken to reduce, re-use and recycle any waste that is produced through the development process;*
- c) the steps to be taken to reduce the production of hazardous wastes in the development process;*
- d) the steps to be taken to minimise the use of raw materials in the development process;*
- e) the steps to be taken to reduce the use of hazardous materials in the development process;*
- f) the steps to be taken to minimise the pollution potential of unavoidable waste;*
- g) the steps to be taken to dispose of unavoidable waste in an environmentally acceptable manner;*
- h) the steps to be taken to ensure maximum waste recovery (e.g. recycling and composting) once the development is completed/occupied; and*
- i) proposals for the transport of waste created during the development process and subsequent use of the site.”*

The above mentioned statements have informed the assessment methodology.

- e) Subsequent to publication of the Waste Core Strategy, the councils published the Development Plan Document “Wiltshire and Swindon Submission Draft Waste Site Allocations” (2012) (Ref 12.13), which allocated sites for waste management. This Development Plan Document was supported by the report “Evidence base part B: Waste” which discussed current and future arisings of waste and the treatment capacity within the County.

12.1.11 The above mentioned information has informed the assessment methodology and has been used to set a baseline.

12.1.12 The assessment has also taken account of the key legislation relevant to waste management for the Scheme, including, but not limited to:

- a) The Waste (England and Wales) Regulations 2011 (as amended) (Ref 12.14);
- b) The Environmental Permitting (England and Wales) Regulations 2016 (Ref 12.15);
- c) Environmental Protection Act 1990 (as amended) (Ref 12.16);
- d) Hazardous Waste (England and Wales) Regulations 2005 (as amended) (Ref 12.17); and
- e) Waste Framework Directive 2008/98/EC (Ref 12.15).

12.2 Assessment methodology

- 12.2.1 The assessment in this chapter has been undertaken in accordance with the guidance provided in the IAN 153/11 (Ref 12.1) "Guidance on the Environmental Assessment of Material Resources". The guidance outlines the scope required for both 'Simple' and 'Detailed' assessments of materials. The "Detailed" assessment has been conducted for the Scheme, to the extent possible given the information available at this stage of the design. A detailed assessment has been conducted due to the high construction value and complex nature of the Scheme. A simple assessment was not able to identify all environmental impacts and the measures to mitigate the impacts.
- 12.2.2 Following the guidance in IAN 153/11, this assessment has identified and quantified the following, using professional judgement where appropriate:
- a) the types and quantities of materials required for the project;
 - b) details of the sources of materials;
 - c) the cut and fill balance;
 - d) the types and quantities of forecast waste arisings from the project;
 - e) waste that requires storage on site prior to re-use, recycling or disposal;
 - f) materials and wastes to be pre-treated on site for re-use within the project;
 - g) waste requiring treatment and/or disposal offsite; and
 - h) the impacts that may arise from the issues identified in relation to materials and waste.
- 12.2.3 The receptors for this assessment are:
- a) Waste management infrastructure in Wiltshire and the South West and South East of England (specifically the landfill disposal capacity).
 - b) Material assets used for construction.

- 12.2.4 The magnitude of waste management effects and their significance have been assessed by:
- Establishing the baseline for landfill capacity in the South East and South West of England;
 - Estimating the likely types and quantities of waste that would be generated by the Scheme; and
 - Comparing the likely waste arisings from the Scheme to the baseline landfill capacity and assessing the likely impact on that capacity.
- 12.2.5 The magnitude of material asset effects and their significance have been assessed by:
- Estimating the likely types and quantities of the main construction materials that would be required by the Scheme;
 - Estimating the likely proportion of construction and demolition waste that would be recycled;
 - Estimating the proportion of secondary or recycled aggregate that would be used for construction of the Scheme; and
 - Comparing the likely recycling rate and proportion of recycled and secondary aggregate to the relevant national targets.
- 12.2.6 The criteria used for assessing the magnitudes of effects and their significance are shown in Table 12.2.

Table 12.2: Magnitudes of effects and significance criteria

Magnitude of Effect	Significance	Material Assets	Waste
Neutral	Not Significant	<ul style="list-style-type: none"> Project achieves >99% overall material recovery / recycling (by weight) of non-hazardous Construction Demolition Waste (CDW) to substitute use of primary materials; and Aggregates required to be imported to site comprise >99% re-used / recycled content. 	<ul style="list-style-type: none"> No reduction or alteration in the capacity of waste infrastructure at a regional scale.

Magnitude of Effect	Significance	Material Assets	Waste
Slight	Not Significant	<ul style="list-style-type: none"> Project achieves 70-99% overall material recovery / recycling (by weight) of non-hazardous CDW to substitute use of primary materials; and Aggregates required to be imported to site comprise re-used/recycled content in line with the relevant regional percentage target. 	<ul style="list-style-type: none"> ≤1% reduction or alteration in the regional capacity of waste infrastructure; and Waste infrastructure has sufficient capacity to accommodate waste from a project, without compromising integrity of the receiving infrastructure (design life or capacity) within the region.
Moderate	Significant	<ul style="list-style-type: none"> Project achieves less than 70% overall material recovery / recycling (by weight) of non-hazardous CDW to substitute use of primary materials; and Aggregates required to be imported to site comprise re-used/recycled content below the relevant regional percentage target. 	<ul style="list-style-type: none"> >1% reduction or alteration in the regional capacity of waste infrastructure as a result of accommodating waste from a project; and 1-50% of project waste requires disposal outside of the region.
Large	Significant	<ul style="list-style-type: none"> Project achieves <70% overall material recovery / recycling (by weight) of non-hazardous CDW to substitute use of primary materials; and Aggregates required to be imported to site comprise <1% re-used / recycled content; and Project sterilises ≥1 mineral safeguarding site and/or peat resource. 	<ul style="list-style-type: none"> >1% reduction or alteration in the regional capacity of waste infrastructure as a result of accommodating waste from a project; and >50% of project waste requires disposal outside of the region.
Very Large	Significant	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> >1% reduction or alteration in national capacity of waste infrastructure, as a result of accommodating waste from a project; or Project would require new (permanent) waste infrastructure to be constructed to accommodate waste.

Scoping

12.2.7 Table 12.3 provides an overview of the Scoping Opinion and responses and an indication of where the scoping opinion point has been addressed within this chapter.

12.2.8 Where assessment has been undertaken in accordance with the scoping opinion point, a response and the relevant ES section is provided; where an

alternative approach has been agreed with the relevant stakeholders, an explanation is provided.

12.2.9 The Scoping Opinion as received is provided in Appendix 4.1.

Table 12.3: Scoping Opinion and response

Scoping opinion	Response	Where addressed within the ES
Planning Inspectorate		
Operational waste - Applicant’s proposed matters to scope out operational waste - The Inspectorate agrees that an assessment of waste produced during operation can be scoped out due to the very small quantities of waste predicted to arise.	Noted and agreed.	Section 12.6.9
Baseline - Other points, baseline - The Scoping Report states the baseline information for materials will consist of current capacity of the waste infrastructure. This appears to partly contradict section 5.3.1 which states that baselines will be determined at either the start of construction or the start of operation.	There is no information available on future waste infrastructure capacity or materials usage, and hence in the absence of this information, the baseline for materials is taken as current capacity and usage.	Section 12.5
Potential Impacts - Other points, potential impacts - The Scoping Report lacks detail to describe how any proposed mitigation measures will be implemented and secured. The ES should clearly explain the proposed mitigation which is relied upon for the assessment of significant effects. Where the mitigation constitutes specific plans or procedures (for example, construction environmental management plans (CEMPs), material management plans and site waste management plans), the interrelationship and relevant hierarchy should be explained.	The approach to mitigation is described in section 1.4 of the ES. Mitigation measures relating to materials and waste are described in the ES and in the Outline Environmental Management Plan (OEMP). The OEMP includes a requirement on the Contractor to produce a Materials Management Plan and a Site Waste Management Plan.	Section 12.7.1
On Site and Off Site management routes for tunnel spoil - The Scoping Report suggests that on-site and offsite locations are to be considered for the management of tunnel spoil. The ES should explain the likely locations and assess the impacts associated including any impacts from transportation and storage. If storage (on site or off site) requires there to be mounds of earth, the duration should be considered alongside consequential impacts such as landscape and visual, water resource and air quality impacts.	The Tunnel Arisings Management Strategy of the ES describes potential locations for on-site and off-site tunnel arisings management and includes consideration of the likely impacts of transportation of materials. The impacts associated with any temporary stockpiles of materials have been assessed as part of the Landscape Visual Impact Assessment.	Tunnel Arisings Management Strategy, Appendix 12.1.

Scoping opinion	Response	Where addressed within the ES
Environment Agency		
Duty of care - Highways England and its consultants need to ensure duty of care for any waste material produced by this project. This would need to include any hazardous waste produced. If there are fuel bowzers/tanks onsite these must be bunded and stored in a suitable area. Any amenity issues for local resident must be risk assessed and controlled.	Mitigation measures for the control and management of waste, including hazardous materials, including application of the Duty of Care, are described in the ES and further in the OEMP.	Section 12.7.5
Wiltshire Council		
Waste Strategy - The policy context appears to omit what would be a relevant development plan policy in the Wiltshire and Swindon Waste Core Strategy – policy WCS6 on Waste Reduction and Auditing, with particular regard to the Waste Audit.	Policy WCS6 has been used to inform the assessment and regular auditing of waste generation is included in the OEMP.	Policy WCS6 has been considered throughout the assessment process.
The excavation of the tunnel and associated engineering works to provide the new road have the capacity to generate a lot of material that may (if not re-used on the route) create a lot of additional HGV traffic that will be using the local road network. This hasn't been explored in detail within the report as the calculations are still outstanding. However, it would be expected that the EIA examine this and the associated ramifications, for example, if a lot of additional traffic is generated, it could use routes through AQMAs further afield, depending on where its end delivery point was.	The Tunnel Arisings Management Strategy describes potential locations for on-site and off-site tunnel arisings management and includes consideration of the likely impacts of transportation of materials, including in relation to air quality.	Tunnel Arisings Management Strategy, Appendix 12.1.
Public Health England		
The EIA should demonstrate compliance with the waste hierarchy (e.g. with respect to re-use, recycling or recovery and disposal). For wastes arising from the installation the EIA should consider: - the implications and wider environmental and public health impacts of different waste disposal options - disposal route(s) and transport method(s) and how potential impacts on public health will be mitigated	It is expected that, during construction and operation of the Scheme, the contractor would apply the waste hierarchy as part of the embedded mitigation measures. Any environmental or public health impacts associated with the use of specific off-site waste management facilities should properly be addressed under the environmental permitting process for those facilities. The Tunnel Arisings Management Strategy considers the wider impacts of how this particular waste stream is managed. Transport of waste and materials is included as part of the overall construction traffic assessments.	Application of waste hierarchy set out in 12.7.1 Tunnel Arisings Management Strategy, Appendix 12.1.

Consultation

- 12.2.10 Discussions have been held with Wiltshire Council (the Waste Disposal Authority for the Scheme area) and the Environment Agency, the regulator for waste management in England. Officers from Wiltshire Council and the Environment Agency have provided information on local waste management facilities and regulatory requirements.
- 12.2.11 The assessment methodology for material assets has been developed further since the Scoping Report was issued. Instead of comparing material use with the national markets for these materials as was proposed in the Scoping Report, the assessment now compares the estimated recycling rate of construction waste with national targets, and also compares the proportion of recycled aggregate that would be used with national and regional targets. Discussions were held with Wiltshire Council and the Environment Agency on these changes and no objections were raised. Agreement was confirmed by Wiltshire Council in September 2018.

12.3 Assessment assumptions and limitations

- 12.3.1 This assessment is based on the Scheme design. Detailed information relating to the sources of construction materials was not available at the time of writing.
- 12.3.2 Information on the current permitted local and regional landfill capacity is provided in Table 12.6, Table 12.7 and Table 12.8. There is no available information on any potential changes to this permitted capacity by the time of construction of the Scheme.

12.4 Study area

- 12.4.1 The study area for waste generation is defined by the boundary of the Scheme, within which waste would be generated.
- 12.4.2 The study area for waste management comprises the wider region within which waste management infrastructure is located, i.e. the South West and South East of England regions (since the Scheme lies close to the boundary between these two regions and hence waste could potentially be managed by facilities in either region).
- 12.4.3 The study area for construction materials includes the whole of the UK, since the main construction materials include aggregate, concrete, asphalt and steel which have national (and in some cases international) rather than local supply chains.

12.5 Baseline conditions

Current Baseline

- 12.5.1 The baseline conditions are the current regional landfill capacity and national construction material provision, based on the most recently published sources

of information. There is no information available on future waste infrastructure capacity or materials usage, and hence the baseline scenario uses current data.

Materials

- 12.5.2 The baseline target for recycling of construction and demolition waste is 70%, as set out in the EU Waste Framework Directive and the Waste Plan for England. Uncontaminated excavated soil and stones (European Waste Code 17 05 04) are specifically excluded from this target.
- 12.5.3 The baseline targets for alternative aggregates (which comprises both secondary aggregates, which are by-products from industrial and mining operations, and recycled aggregates, which are produced from construction waste) are set out in the National and Regional Guidelines for Aggregates Provision in England 2005 to 2020 (Ref 12.10) and are summarised in Table 12.4 below. The relevant target for Scheme is the 22% guideline for the South West region.

Table 12.4: National and regional guidelines for aggregates provision

Region	Total aggregate provision (million tonnes)	Alternative materials targets (secondary and recycled aggregates)
South East	502	26%
London	197	48%
East	382	31%
East Midlands	784	14%
West Midlands	370	27%
South West	656	22%
North West	392	30%
Yorkshire and the Humber	431	31%
North East	193	26%
England (total)	3908	25%

Waste

- 12.5.4 Baseline information consists of the current capacity of the waste infrastructure in the waste disposal authority (Wiltshire), and in the wider South East and South West planning regions.
- 12.5.5 Information on baseline waste conditions has been collected from sources including local planning documents published by Wiltshire Council and data on waste facility capacity published by the Environment Agency.
- 12.5.6 The Wiltshire and Swindon Waste Site Allocations Development Plan Document Evidence base part B: Waste (Ref 12.13) provides data as shown in Table 12.5.

Table 12.5: Data provided in the evidence base part B: Waste report

Waste type	Waste generation in 2009 (tonnes)	Waste sent for landfill in 2009 (tonnes)	Indicative landfill requirements in 2020 (tonnes per annum)	Landfill capacity to be delivered (2011-2026) (m ³)
Commercial & Industrial (C&I)	452,513	114,925	120,000-130,000	363,204
Construction & Demolition (C&D)	105,032	Data not provided	190,000	Sufficient capacity available
Hazardous waste	69,061	40,071	Data not provided	Sufficient capacity available

12.5.7 The Environment Agency's Waste Management Information 2016 (Ref 12.18) (published in 2017) includes the following information about waste sent to landfills in 2016 and remaining landfill capacity in Wiltshire, and in the wider South East and South West regions as shown in Table 12.6, Table 12.7 and Table 12.8.

Table 12.6: Wiltshire landfill inputs and capacity 2016

Landfill Type	Inputs (tonnes)	Capacity (m ³)
Hazardous Merchant	29,000	424,000
Hazardous Restricted	-	-
Non Hazardous with SNRHW* cell	64,000	929,000
Non Hazardous	301,000	4,545,000
Non Hazardous Restricted	-	-
Inert	264,000	134,000
Total	658,000	6,033,000

Table 12.7: South West landfill inputs and capacity 2016

Landfill Type	Inputs (tonnes)	Capacity (m ³)
Hazardous Merchant	148,000	1,748,000
Hazardous Restricted	-	-
Non Hazardous with SNRHW* cell	481,000	4,362,000
Non Hazardous	1,750,000	11,025,000
Non Hazardous Restricted	-	-
Inert	660,000	9,763,000
Total	3,038,000	26,898,000

Table 12.8: South East landfill inputs and capacity 2016

Landfill Type	Inputs (tonnes)	Capacity (m ³)
Hazardous Merchant	14,000	550,000
Hazardous Restricted	21,000	10,000
Non Hazardous with SNRHW* cell	2,692,000	29,386,000
Non Hazardous	2,517,000	17,237,000
Non Hazardous Restricted	-	-
Inert	2,792,000	29,795,000
Total	8,036,000	76,979,000

*SNRHW = selected non-reactive hazardous waste

Future baseline

- 12.5.8 There is no available information on any potential changes to this permitted capacity by the time of construction of the Scheme. A notional 'capacity gap' for the period up to 2026 that the Waste Site Allocations Local Plan (Ref 12.13) would need to address is provided by Wiltshire Council and Swindon Borough Council. However this information is insufficient to set a construction year or opening year baseline since it is not possible to accurately estimate the extent of any additional permitted waste management capacity that may be developed by 2021.

12.6 Potential impacts

Construction

- 12.6.1 Prior to implementation of the mitigation, the potential impacts of the Scheme with regards to material resources and waste arisings include:
- effects on the availability and use of secondary and recycled construction materials; and
 - effects that on-site generated materials (e.g. soils) and waste arisings have on the existing capacity of waste management facilities.
- 12.6.2 Table 12.9 summarises the types of materials that would be used and wastes that may be generated.

Table 12.9: Types of material use and waste generation

Project Activity	Material resources required for the project	Waste arisings from the project
Site remediation / preparation / earthworks / tunnelling	<ul style="list-style-type: none"> Fill material for construction purposes. Primary and secondary/recycled aggregates for ground 	<ul style="list-style-type: none"> Surplus excavated materials. Stripped topsoil and subsoil. Contaminated soils.

Project Activity	Material resources required for the project	Waste arisings from the project
	stabilisation. <ul style="list-style-type: none"> Stripped topsoil and subsoil. 	<ul style="list-style-type: none"> Site clearance, green waste arisings. Excavated material.
Demolition	<ul style="list-style-type: none"> Materials are not required for demolition works. 	<ul style="list-style-type: none"> Waste arisings from the demolition of any existing buildings or structures.
Site construction	<ul style="list-style-type: none"> Construction materials including: <ul style="list-style-type: none"> Concrete; Asphalt and bituminous material; Cement bound granular material; Well graded granular material; Precast concrete kerb; Timber; Plywood; Cementitious grout; Reinforcing steel; Reinforcing fabric; Geotextile; Geo-composite drainage system; Pipe bedding aggregate; Filter drain material; and Tunnel lining. 	<ul style="list-style-type: none"> Packaging from materials delivered to site. Excess and broken/damaged construction materials. Existing highway infrastructure and technology as removed by excavation works. Waste oils from construction vehicles. Waste additives and conditioning agents from tunnel arisings management (excluding waste water which is considered in the Water chapter). Construction worker wastes (excluding sewage which is considered in the Water chapter).

12.6.3 The estimated main types and quantities of materials anticipated to be used during construction are shown in Table 12.10.

Table 12.10: Estimated main types and quantities of materials used during construction

Materials	Quantity
Concrete (ready mixed)	916,000 tonnes
<i>Includes:</i>	
<i>Sand and gravel</i>	<i>645,000 tonnes</i>
<i>Cementitious material (Portland cement and pulverised fuel ash)</i>	<i>158,000 tonnes</i>
Concrete (products) e.g. precast concrete kerb and tunnel lining	760 tonnes
Steel (rebar)	74,000 tonnes
Asphalt and bituminous material	191,000 tonnes
Aggregates (excluding aggregates for concrete)	
<i>Crushed rock or recycled/secondary aggregate</i>	<i>111,000 tonnes</i>
Soil (topsoil and subsoil)	No import of soil required

Materials	Quantity
Timber/plywood e.g. form work and shuttering	8660 sheets of shuttering and 68m ³ of timber struts
Cement, binders and cementitious grout for tunnelling and earthworks (excluding cementitious material for concrete)	153,000 tonnes
Geotextile	50 tonnes
Geo-composite drainage system	1 tonne
Additives and conditioning agents for tunnel arisings management	Information not available

- 12.6.4 The estimated quantities of earthworks materials (excluding tunnel arisings) are expected to be balanced, in that the quantities of excavated material would be approximately equal to the quantities of fill required, and hence there would be no requirement for off-site (outside the boundary of the Scheme) transport, reuse, recycling or disposal of surplus excavated soil and rock.
- 12.6.5 In addition to these earthworks, it is estimated that an additional 900,000m³ of tunnel arisings would be generated from the tunnelling works.
- 12.6.6 The estimated main types and quantities of waste generated during construction and the potential recovery rates are shown in Table 12.11.

Table 12.11: Estimated quantities of waste

Project activity	Waste arisings from the project	Quantity (tonnes)	Quantity (m ³)	Potential management routes	Recovery rate (%)
Construction	Concrete (ready mixed)	32,300	13,500	Off-site recycling or disposal	95%
	Concrete (products) e.g. precast concrete kerb and tunnel lining	200	80	Off-site recycling or disposal	95%
	Steel	740	1,800	Off-site recycling	100%
	Asphalt and bituminous material	2,900	3,500	Off-site recycling or disposal	95%
	Aggregates	250	200	Off-site recycling or disposal	95%
	Soil (topsoil and subsoil)	Not expected – balanced earthworks		-	-
	Timber/plywood e.g. form work and shuttering	200	600	Off-site recycling or energy recovery	90%
	Cement and binder / cementitious grout	13,200	5,500	Off-site recycling or disposal	75%

Project activity	Waste arisings from the project	Quantity (tonnes)	Quantity (m ³)	Potential management routes	Recovery rate (%)
	Geotextile	50	160	Off-site recycling or disposal	50%
	Geo-composite drainage system	<1	<1	Off-site recycling or disposal	50%
	Additives and conditioning agents for tunnel arisings management (surplus slurry following completion of tunnelling)	3,000	3,000	Taken back by suppliers for reuse or recycling, taken offsite for recycling or disposal	No information – 0% assumed
Site remediation and preparation	Contaminated soil	Not expected		-	-
	Vegetation arising from site clearance	160	460	Off-site composting	100%
	Soil (topsoil and subsoil)	Not expected – balanced earthworks		-	-
Demolition	Asphalt from removal of existing road, some of which may contain coal tars	Not expected – existing carriageway to remain in-situ		-	-
Construction (including tunnelling)	Packaging from materials delivered to site	30	80	Taken back by suppliers for reuse or recycling, taken offsite for recycling or disposal	85%
	General office waste/construction worker waste	60	200	Off-site recycling or disposal	50%
	Waste oils from construction vehicles	70	80	Off-site recycling or disposal (hazardous waste)	100%
	Liquid waste	<2	<2	Off-site disposal (potentially hazardous waste)	0%
Total:		53,160	29,160		84%

12.6.7 Waste volumes have been calculated from estimated tonnages using WRAP's waste volume to mass conversion factors (Ref 12.21). The estimated recovery rates are based on the "good practice quick win" recovery rates set out in the "Achieving good practice Waste Minimisation and Management" report published by WRAP (12.22). The overall recovery rate is calculated by tonnage.

- 12.6.8 Excavated material is not included in Table 12.11 or when calculating the overall waste recovery rate, since the material would be reused on site and hence not be categorised as a waste (see Appendix 12.1). This approach is consistent with the waste hierarchy and the objectives of minimising waste generation and reusing materials.

Operation

- 12.6.9 Material use and waste generation is expected to be very small during operation of the Scheme. Routine maintenance would include gully emptying and litter collection. Periodically, maintenance activities such as resurfacing would be required. Waste arising from these maintenance activities is expected to be generally the same (in both type and quantity) to that generated by the existing road; and the wastes would be managed using the established procedures and facilities that are used across the strategic highways network.
- 12.6.10 For these reasons, materials and waste during the operational phase have been scoped out of the assessment, as has been agreed by the Inspectorate and outlined in the Scoping Opinion response table (Appendix 4.1).

12.7 Design, mitigation and enhancement measures

Construction

Embedded mitigation

- 12.7.1 The following mitigation measures would be implemented during the design and construction phases:
- waste arisings would be prevented and designed out where practicable;
 - opportunities to re-use material resources would be sought;
 - opportunities to support the circular economy would be considered.
- 12.7.2 An Outline Environmental Management Plan (OEMP) has been prepared as an iterative process in parallel with the development of the Scheme design and construction methodology. Measures within it include design, construction and operational mitigation, which have been defined in part by the requirements which arise from the technical assessments presented in this ES. The technical assessments within this ES have taken account of the agreed measures within the OEMP as 'embedded mitigation'. The OEMP is provided within the DCO application.
- 12.7.3 The construction of the Scheme would be subject to measures and procedures defined within a Construction Environmental Management Plan (CEMP). The CEMP would be based on, and incorporate, the requirements of the OEMP, and would include the implementation of industry standard practice and control measures for environmental impacts arising during construction, such as the control of dust and the approach to waste management on site. The CEMP

would be produced by the contractor prior to works commencing in accordance with IAN 183/14 (Ref 12.19), and this CEMP would include a Site Waste Management Plan (SWMP).

12.7.4 The CEMP would require contractors to adopt good practice in construction waste management which would reduce the quantity of waste generated. The following approaches would be implemented, where practicable, in order to minimise the quantities of waste requiring disposal:

- a) Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back Scheme.
- b) Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste.
- c) Attention to material quantity requirements to avoid over-ordering and generation of waste materials.
- d) Re-use of materials wherever feasible, e.g. re-use of excavated soil for landscaping. Concrete would be taken off-site for crushing and re-use.
- e) Segregation of waste at source where practical.
- f) Re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing).

12.7.5 The CEMP would require that the following waste management measures are implemented in order to minimise the likelihood of any localised impacts of waste on the surrounding environment:

- a) Damping down of surfaces during spells of dry weather and brushing/water spraying of heavily used hard surfaces/access points across the site as required.
- b) Off-site prefabrication, where practical, including the use of prefabricated structural elements, cladding units, toilets, mechanical and electrical risers and packaged plant rooms.
- c) Burning of waste or unwanted materials would not be permitted on-site.
- d) All hazardous materials including fuels, chemicals, cleaning agents, solvents and solvent containing products to be properly sealed in sealed containers at the end of each day prior to storage in appropriately protected and bunded storage areas.
- e) All demolition and construction workers would be required to use appropriate Personal Protective Equipment (PPE) whilst performing activities on-site;

- f) Any waste effluent would be tested and where necessary, disposed of at the correctly licensed facility by a licensed specialist contractor/s;
- g) Materials requiring removal from the Site would be transported using licensed carriers and records would be kept detailing the types and quantities of waste moved, and the destinations of this waste, in accordance with the relevant regulations.

12.7.6 The OEMP sets a target that 22% of aggregates should be secondary and recycled aggregates, for those applications where it is technically and economically feasible to substitute these alternative materials for primary aggregates.

12.7.7 The CEMP would be prepared in accordance with IAN 183/14, and would include a SWMP. The SWMP would set out a recording process for the management of waste, including the storage and transport of waste on-site and a recording mechanism for required waste documentation such as Waste Transfer or Consignment Notes (dependent on the waste stream) in order to confirm the assessment of the waste impact and to implement the embedded mitigation measures. The SWMP would include procedures for monitoring the overall construction waste recovery rate and the proportion of secondary and recycled aggregate used in the Scheme, in order to confirm the assessment of materials impacts.

Additional mitigation

12.7.8 Additional mitigation is required in relation to approximately 900,000 m³ of chalk tunnel arisings that would be produced from tunnel excavations. A tunnel arisings management strategy has been produced (Appendix 12.1) which describes the options for managing tunnel arisings from the Scheme, assesses these options, and identifies the selected option.

12.7.9 The excavated material from the tunnelling operation would be processed as part of the tunnelling works, to produce a material suitable for use on site.

12.7.10 The excavated material would be used on land to the east of Parsonage Down National Nature Reserve (NNR) to:

- a) blend the new highway embankments into the existing topography and so reduce the landscape impacts of the new alignment;
- b) create new chalk grassland and other habitats and extend the existing Parsonage Down habitats. This has been successfully achieved at other sites where chalk tunnelling excavations have been used for habitat creation, such as at Samphire Hoe near Dover using material from the channel tunnel.

12.7.11 Use of the excavated material to the east of Parsonage Down would remove the need to transport surplus material on the highway network to off-site disposal

facilities. This would avoid the adverse environmental effects on people and communities living along the routes to the off-site disposal facilities.

12.8 Assessment of effects

Material assets

- 12.8.1 The Scheme would set a target of 22% use of secondary and recycled aggregates, for those applications where it is technically and economically feasible to substitute these alternative materials for primary aggregates. This target is in accordance with the regional guidelines for South West England, but given the location of the Scheme (relatively remote from large sources of secondary and recycled aggregate) it may be difficult to achieve this target in practice. The effects are assessed as being moderate and significant.
- 12.8.2 Applying good industry practice to management of the waste materials generated by the Scheme, it is anticipated that an overall recovery rate of 84% can be achieved. This exceeds the Government's 70% target for recovery of construction waste and the effects are therefore assessed as being slight and not significant.

Tunnel arisings

- 12.8.3 Excavated material would be re-used within the boundary of the Scheme, to the east of Parsonage Down National Nature Reserve (NNR) (Appendix 12.1). Excavated material would be managed in accordance with a Materials Management Plan (MMP) produced under the CL:AIRE Code of Practice (Ref 12.20) and would not be considered as a waste. The on-site management of excavated material would therefore not require the use of any existing waste management capacity in the region and would not have significant waste management effects.
- 12.8.4 Placement of excavated material to the east of Parsonage Down forms part of the design for the Scheme and the potential impacts associated with this activity have been identified and reported in the relevant chapters of this ES.

Waste

- 12.8.5 Construction of the Scheme is expected to generate approximately 53,000 tonnes of waste (approximately 30,000m³), excluding excavated material which would not be managed as waste (Table 12.11).
- 12.8.6 The existing landfill capacity in the south of England (of all types) has been determined from Environment Agency data (Ref 12.18), as being approximately 100 million m³.
- 12.8.7 Based on a worst-case assumption that all waste generated from the Scheme would be disposed of to landfill, this would utilise approximately 0.03% of the regional landfill capacity. In practice a large proportion of waste from the

Scheme is likely to be recycled rather than disposed of to landfill, further reducing the overall quantities of waste for disposal.

- 12.8.8 The Scheme would result in less than 1% reduction or alteration in the regional capacity of waste infrastructure, and there is adequate disposal capacity within the region to accommodate all the waste from the Scheme (although in practice a high proportion of waste would be recovered rather than requiring disposal). The effects are therefore assessed as being slight and not significant.

Summary of effects

- 12.8.9 In summary, the only significant effect would occur if the Scheme is unable to meet the target of 22% use of secondary and recycled aggregate. Because the Scheme is located in a rural area with relatively few sources of secondary and recycled aggregate, it is possible that it may not be practicable to meet this target.
- 12.8.10 No other significant effects are expected.

12.9 Monitoring

- 12.9.1 The only significant effect would occur if the Scheme is unable to meet the target of 22% use of secondary and recycled aggregate. This effect relates to a regional target, and not to any local effects in the immediate vicinity of the Scheme. On that basis, no monitoring of significant effects is proposed.
- 12.9.2 The OEMP sets out monitoring to be undertaken during the construction stage to ensure that the mitigation measures embedded in the Scheme design are appropriately implemented.

References

- Ref 12.1: Highways Agency, 2011. Interim Advice Note 153/11: Guidance on the environmental assessment of material resources
- Ref 12.2: Highways Agency, 2008. Design Manual for Roads and Bridges Advice Note HA204/08: Scoping of Environmental Impacts
- Ref 12.3: Highways Agency, 2008. Design Manual for Roads and Bridges Advice Note HA200/08: Aims and Objectives of Environmental Assessment
- Ref 12.4: Highways Agency, 2015. Interim Advice Note 125/15: Environmental Assessment Update
- Ref 12.5: Official Journal of the European Union, 2008. Waste Framework Directive (2008/98/EC)
- Ref 12.6: Department for Transport, 2014. National Policy Statement for National Networks (NPSNN)
- Ref 12.7: Ministry of Housing, Communities and Local Government, 2018. National Planning Policy Framework
- Ref 12.8: Department for Environmental Food and Rural Affairs, 2013. Waste Management Plan for England
- Ref 12.9: Department for Communities and Local Government, 2014. National Planning Policy for Waste
- Ref 12.10: Department for Communities and Local Government, 2009. National and Regional Guidelines for Aggregates Provision in England 2005 to 2020
- Ref 12.11: Wiltshire Council, 2015. Wiltshire Council Core Strategy Development Plan Document
- Ref 12.12: Swindon Borough Council and Wiltshire Council, 2009. Wiltshire and Swindon Waste Core Strategy 2006-2026.
- Ref 12.13: Swindon Borough Council and Wiltshire Council, 2013. Wiltshire and Swindon Waste Site Allocations Development Plan Document
- Ref 12.14: The Waste (England and Wales) Regulations 2011 (as amended)
- Ref 12.15: The Environmental Permitting (England and Wales) Regulations 2016
- Ref 12.16: Environmental protection Act 1990 (as amended)
- Ref 12.17: Hazardous Waste (England and Wales) Regulations 2005 (as amended)
- Ref 12.18: Environment Agency, 2017. Waste Management for England 2016.
- Ref 12.19: Highways Agency, 2014. Interim Advice Note 183/14.
- Ref 12.20: Contaminated Land: Applications in Real Environments (CL:AIRE), 2011. The Definition of Waste: Development Industry Code of Practice, Version 2
- Ref 12.21: WRAP, 2014. Waste volume to mass conversion factors
- Ref 12.22: WRAP, undated. Achieving Good Practice Waste Minimisation and Management

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