



**AQUIND Limited**

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## **PEIR CHAPTER 26**

Waste and Material Resources



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## 26 WASTE AND MATERIAL RESOURCES

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### 26.1 SCOPE OF THE ASSESSMENT

#### 26.1.1 INTRODUCTION

- 26.1.1.1 This chapter provides the preliminary information regarding onshore waste and material resources and how they will be taken into account in the context of the Proposed Development. The assessment of environmental impacts is ongoing and will be reported in the ES. The Proposed Development is described in Chapter 3 Description of the Proposed Development.
- 26.1.1.2 This chapter considers the potential for impacts associated with the following activities to occur:
- The consumption of materials and products (from primary, recycled or secondary and renewable sources, and including materials offering sustainability benefits), as well as the generation and use of arisings recovered from the whole Proposed Development (the Converter Station, the Onshore Cable Corridor, the Landfall and the Marine Cable Corridor); and
  - The production and disposal of waste to landfill for the whole Proposed Development.
- 26.1.1.3 The assessment of waste and material resources will exclude (scope out):
- Lifecycle assessment (including embodied carbon and water) of materials and arisings, and waste. The effort and resources required to undertake a full lifecycle assessment of these elements are deemed disproportionate to the benefit they would offer the assessment of significance of effect; and
  - Materials consumption, and arisings and waste production beyond the first full year of operation, as their impacts and associated effects have been deemed to be not significant.
- 26.1.1.4 It is important to note that direct and indirect impacts resulting from the transportation of material resources and waste to and from site, will not be assessed within the Waste and Material Resources chapter. Instead, they will be considered in the following chapters: Chapter 21 - Traffic and Transport, Chapter 22 - Air Quality, Chapter 23 - Noise and Vibration and Chapter 27 - Carbon and Climate Change.
- 26.1.1.5 Consideration of the impact of the Proposed Development on mineral and waste sites and potential sterilisation of mineral resources is contained in Chapter 18 - Ground Conditions of this PEIR.
- 26.1.1.6 Whilst not considered in this chapter, the potential for impact to occur as a consequence of the Proposed Development from embedded carbon is considered in Chapter 27 - Carbon and Climate Change.

26.1.1.7 FOC infrastructure is anticipated to be located adjacent to the Converter Station (up to two Telecommunications buildings) and within approximately 1 km of Landfall (up to two Optical Regenerations Stations), and other associated equipment for auxiliary power supply, and security fencing, as described in Chapter 3. However, as the locations are not yet confirmed, the assessment of these elements of the Proposed Development will be considered in the ES when further details are available.

### STUDY AREA

26.1.1.8 The primary study in respect of the waste and material resources assessment area comprises all development shown within the Site Boundary (see Figure 3.2). This will comprise:

- Section 1 - Lovedean (Converter Station Area). The Converter Station and Access Road will be constructed on agricultural fields, with the Access Road tying into an existing road infrastructure on Broadway Lane. The Converter Station is anticipated to have an approximate footprint (including ground and security fencing) in the region of 4 hectares. In addition, approximately 2 km of underground 400 kV AC cables will connect the Converter Station to the existing National Grid Lovedean substation.
- Sections 2 to 9 – the Onshore Cable Route (incorporating multiple options for Sections 3, 4, 7, 8, and 9). Whilst there are options still under consideration it is known that the cable will be laid in trenches (either excavated or using HDD) through farmland, existing road infrastructure, car parks and playing fields. The cables will comprise four HVDC cables and two fibre optic data transmission cables covering an approximate distance of 20 km. The cables will be installed in two trenches, each accommodating two HVDC cables and one FOC.
- Section 10 – Eastney (Landfall). The cable will be laid under existing road infrastructure and the preferred Landfall location at the car park to the south of Fort Cumberland Road and west of Fort Cumberland SINC. From the car park, the cables will be installed by HDD into the English Channel where they become the Marine Cable Route.
- The Marine Cable Route. The HVDC and fibre optic cables will be laid at sea between Section 10 – Landfall in Eastney and the UK EEZ, a distance of approximately 108 km. Any transboundary effects associated with the marine element, for example sourcing of construction materials from France or disposal of wastes in France are currently unknown, but will be assessed further in the ES.

26.1.1.9 The secondary study area extends to the availability of construction materials and capacity of recycling and waste management infrastructure within South East England (comprising the counties of Berkshire, Buckinghamshire, East Sussex, Hampshire, Isle of Wight, Kent, London, Oxfordshire, Surrey and West Sussex).

## 26.2 LEGISLATION, POLICY AND GUIDANCE

26.2.1.1 This assessment takes into account the current legislation, policy and guidance relevant to waste and materials resources. These are listed below.

### 26.2.2 LEGISLATION

- Waste Framework Directive (2008/98/EC) provides a common definition of waste as “any substance or object that the holder discards or intends to or is required to discard”. It is important to note that the definition of ‘discard’ set out in the Waste Framework Directive is different to its dictionary definition: the Directive definition includes any substance or object that is discarded for disposal or that has not been subject to acceptable recovery (including recycling). The framework also provides explicit targets for construction, demolition and excavation wastes: 70% of non-hazardous construction and demolition waste must be recovered, reused or recycled by 2020. The Waste Hierarchy is set out in the framework (Plate 26.1). The main principles of the Waste Hierarchy are:
  - Prevention - using less material in design and manufacture; keeping products for longer; re use; using less hazardous materials;
  - Preparing for reuse - 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 types of) Recovery - anaerobic digestion; incineration with energy recovery; gasification and pyrolysis which produce energy (fuels, heat and power); recovering materials from waste; some backfilling; and
  - Disposal - landfill and incineration without energy recovery.

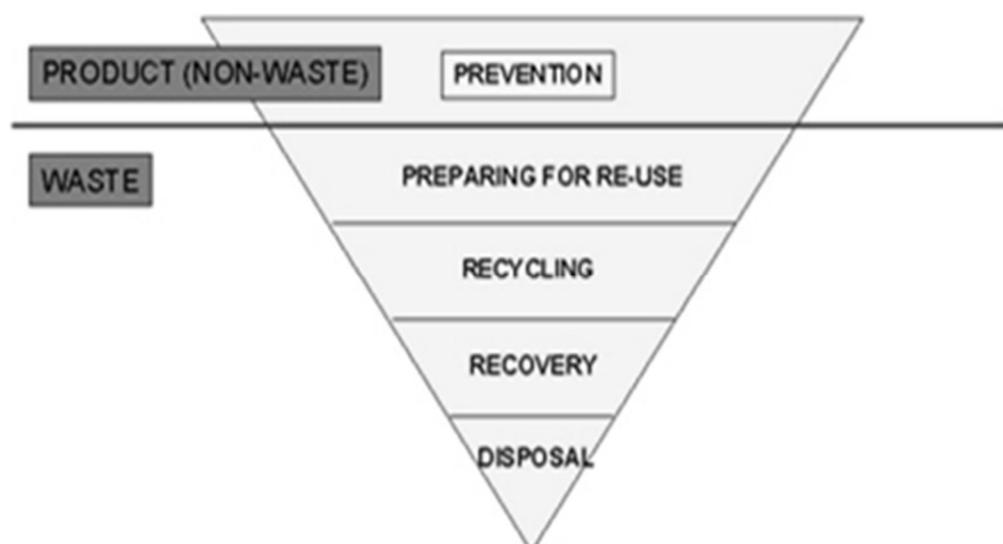


Plate 26.1 - Waste Hierarchy

- The Waste Framework Directive is implemented in England and Wales through The Waste (England and Wales) Regulations 2011. These Regulations stipulate the requirement for industry and businesses to implement the Waste Hierarchy.
- The Controlled Waste (England and Wales) Regulations 2012 provides a definition of controlled waste and classifies waste as household, industrial or commercial waste.
- The Hazardous Waste (England and Wales) Regulations 2005 introduces measures to control the storage, transport and disposal of hazardous waste. It provides a means to ensure that hazardous waste and any associated risks are appropriately managed.
- The Environmental Protection Act 1990 outlines the requirement of the manager of a development to ensure that any excess materials or waste as a result of construction activities are recovered or disposed of without any subsequent adverse effects upon the surrounding environment.
- The Clean Neighbourhoods and Environment Act 2005 states that it is the responsibility of construction workers on site to guarantee that waste is disposed in the appropriate manner. In accordance with this, employees must undertake waste disposal activities as outlined in national law.
- The Control of Pollution Act 1974 makes provisions with respect to the generation and revision of 'waste disposal plans' and prohibits the unlicensed disposal of waste.

### 26.2.3

## PLANNING POLICY

### National Policy

#### National Policy Statement (EN-1)

- National Policy Statement for Energy (Department of Energy & Climate Change, 2011) (EN-1) sets out the Government's policy for delivery of major energy infrastructure. The Policy Statement makes reference to the waste hierarchy in order to implement sustainable waste management and minimise waste generation. Furthermore, the Policy Statement requires the applicant to set out waste management arrangements and prepare a Site Waste Management Plan including details on the proposed waste recovery and disposal system for all waste generated by the development, and an assessment of the impact of the waste on the capacity of waste management infrastructure.

#### National Planning Policy Framework

- The Waste Management Plan for England (Defra, 2013) provides a detailed analysis of the present state of waste management at a national level, and assesses how the objectives of the Waste Framework Directive will be effectively supported. It states that excavation, construction and demolition waste is the largest contributor to total waste generation in the UK.

- The National Planning Policy for Waste (Ministry of Housing, Communities & Local Government, 2014) outlines the ambition to promote a sustainable and efficient approach to resource use and management. It sets out waste planning policies including the delivery of sustainable development and resource efficiency. The policy also states that when determining planning applications for non-waste development, local planning authorities should ensure that the impact on existing waste management facilities is acceptable and that waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal.

### **Local Policy**

- The Hampshire Minerals and Waste Plan (Hampshire County Council, New Forest National Park, Portsmouth City Council, Southampton City Council and South Downs National Park, 2013) has been adopted by the local councils relevant to the Proposed Development (PCC, HBC, WCC and EHDC). This document sets out how mineral resources should be extracted and supplied and the necessary waste management infrastructure required so that Hampshire’s environment will be protected, its communities maintained and the local economy supported. Key policies include:
  - Policy 15: Safeguarding minerals resources. The policy seeks to ensure that strategic sites and/or capacity is protected.
  - Policy 17 Aggregate supply – capacity and source. The policy set out the maintenance of strategic capacity to ensure aggregate production and supply is sufficient.
  - Policy 18: Recycled and secondary aggregates development. The policy seeks to increase and maintain high quality recycled and secondary aggregate capacity.
  - Policy 25: Sustainable waste management. The policy sets out to ensure recycling of non-hazardous wastes reaches 60% by 2020 through the application of the waste hierarchy, encouraging self-sufficiency and sharing of infrastructure.
  - Policy 26: Safeguarding waste infrastructure. The policy seeks to ensure strategic sites and/or capacity are protected.
  - Policy 30: Construction, demolition and excavation waste development. The policy proposes to increase high quality recycled and secondary aggregate capacity.

#### **26.2.4**

### **GUIDANCE**

- IAN 153/11 Guidance on the Environmental Assessment of Material Resources (Highways England, 2011) provides guidance for the assessment of the impacts

and effects associated with the use of materials and generation of waste in new construction, improvement and maintenance projects. The document provides a definition of materials resources:

i “the materials and construction products required for the construction, improvement and maintenance of the trunk road network. Materials resources include primary raw materials such as aggregates and minerals, and manufactured construction products. Many material resources will originate off site, purchased as construction products, and some will arise on site such as excavated soils or recycled road planings”.

- IAN 153/11 does not include a definition of waste, however this is defined in the EU Waste Framework Directive.

## 26.3 SCOPING OPINION AND CONSULTATION

### 26.3.1 SCOPING OPINION

26.3.1.1 As detailed within Chapter 1 Introduction, a Scoping Opinion was received by the Applicant from PINS (on behalf of the SoS) on 07 December 2018, including formal responses from statutory consultees. The responses from PINS in relations to Waste and Materials, and how these requirements should be addressed by the Application are set out in Table 26.1.

26.3.1.2 Appendix 5.3 provides a complete set of responses in the PEIR to the contents of the Scoping Opinion.

**Table 26.1 – PINS Scoping Opinion Response**

Scoping Opinion Ref	Summary of Comment Received	How this has been addressed by the Applicant
<b>Assessment methodology – assessment of significance (Table 29.6)</b>	The Inspectorate notes the intention to define significance using that presented in Table 29.6. The levels of significance are different to that presented in Chapter 4 to the Scoping Report. In that chapter major and major/moderate impacts will be deemed significant. The Waste and Material Resources aspect chapter of the ES should define what level of impact is deemed to be significant, where this differs from the overarching assessment methodology.	Table 26.5 in this PEIR includes a statement on which effect categories are deemed significant or not significant. The methodology for the assessment of Waste and Materials and provided in the preceding text under Section 26.4.
<b>Mitigation – management</b>	The Inspectorate notes reference to the implementation of a CEMP, Materials	An Outline CEMP will be produced as part of the

<b>Scoping Opinion Ref</b>	<b>Summary of Comment Received</b>	<b>How this has been addressed by the Applicant</b>
<b>plans (Paragraph 29.4.20)</b>	Management Plan ('MMP') and Site Waste Management Plan ('SWMP'). Where the ES relies upon mitigation measures which would be secured through management plans, it should be demonstrated (with clear cross-referencing) where each measure is set out in the management plan. The Applicant should provide draft copies of management plan documents appended to the ES and/or demonstrate how they will be secured.	ES which will be adopted by the contractor and refined for use.
<b>Waste types – inert, hazardous, and non-hazardous</b>	It is noted that the types and volumes of waste is not yet known. The ES should specify this information in the assessment. Appropriate cross-referencing to the Ground Conditions aspect chapter should be included, noting the potential for contaminated land within the vicinity of the Proposed Development.	Comment noted and high-level material and waste estimates have been included in this PEIR. Cross reference to known/potential contaminated land will be provided in the ES.

## 26.3.2 CONSULTATION

26.3.2.1 No consultation further to the PINS Scoping Opinion request, has been required or undertaken for the waste and material resources assessment in this chapter.

## 26.4 METHODS OF ASSESSMENT

26.4.1.1 The assessment methodology used in this chapter is based on guidance set out in IAN 153/11 Environmental Assessment of Material Resources (Highways England, 2011) which represents current best practice. With a primary focus on reducing the impacts and effects of materials used for, and waste generated by, construction activities in the highways sector, it is the professional judgement of the author of this chapter that IAN 153/11 is appropriate for use on the cable routing elements of the Proposed Development. The general ethic and principles of the guidance are also applicable to the proposed Converter Station to assess the availability of bulk materials for construction and generation and disposal of waste arisings.

26.4.1.2 In accordance with IAN 153/11, a detailed assessment is considered suitable for complex capital maintenance projects, improvement and larger new construction projects. Given the scale and nature of the Proposed Development, a detailed assessment has therefore been considered appropriate.

26.4.1.3 The methodology has been used to assess the effects of the consumption of materials (including the production and use of arisings), and the generation and disposal of waste associated with the Proposed Development.

26.4.1.4 The assessment takes into account the impacts and effects of the Proposed Development during construction, and for the first full year of operation (2023).

## 26.4.2 MATERIALS

26.4.2.1 The assessment of the effects from materials has been undertaken by considering the origins and sources of materials, including their general availability (production, stock, sales) and the proportion of re-used or recycled materials they contain.

26.4.2.2 The assessment accounts for the relative volume of materials that needs to be consumed. In general, it is expected that the consumption of natural and non-renewable resources would result in adverse impacts.

26.4.2.3 As IAN 153/11 provides no stipulated thresholds for sensitivity or magnitude of impact from materials, the following will be used as the basis for assessment:

- **Sensitivity:** will be determined by evaluating the performance of materials that need to be consumed for the Proposed Development, against the criteria set out in Table 26.2; and
- **Magnitude:** the underlying principle for assessing materials is that, typically, the larger and more complex a development footprint and associated groundworks, the greater the requirement to consume a greater volume and variety of products and goods. The magnitude of change will be determined against the criteria set out in Table 26.3.

26.4.2.4 The assessment accounts for the nature of impacts (adverse/beneficial, permanent/temporary, direct/indirect) from materials, and uses professional judgement to determine the significance of effect.

## 26.4.3 ARISINGS

26.4.3.1 Arisings (from Construction, Demolition and Excavation ('CDE') activities) have been evaluated to determine the volume of excavations that can be retained for re-use or recycling i.e. diverted from landfill. Understanding how the extent to which re-use and recycling will be adopted, will help reduce impacts from both materials consumption, and waste disposal.

26.4.3.2 The assessment takes account of the nature of impacts (adverse/beneficial, permanent/temporary, direct/indirect) from arisings, and uses professional judgement to determine the significance of effect.

## 26.4.4 LANDFILL CAPACITY

- 26.4.4.1 An assessment of the remaining landfill capacity in South East England (including the London area) has been used to determine the impacts and effects of waste generated during construction and the first full year of operation, for the Proposed Development.
- 26.4.4.2 The assessment has considered the volume and type of waste generated and the potential impacts and effects of each on remaining landfill capacity. The assessment has been completed for inert, non-hazardous and hazardous waste types. In general, it is expected that the generation of waste and its disposal to landfill, would result in adverse impacts.
- 26.4.4.3 As IAN 153/11 provides no stipulated thresholds for sensitivity or magnitude of impact from waste, the following will be used as the basis for assessment:
- **Sensitivity:** will be determined by evaluating forecast changes in landfill capacity against the criteria set out in Column 3 of Table 26.2.
  - **Magnitude:** the underlying principle for waste is that, typically, the larger and more complex a development footprint and associated groundworks, the greater the likelihood that waste will be generated and disposed of to landfill. The magnitude of change will be determined against the criteria set out in Table 26.3.
- 26.4.4.4 The assessment takes account of the nature of impacts (adverse/beneficial, permanent/temporary, direct/indirect) from waste generated and disposed of, and uses professional judgement to determine the significance of effect.

## 26.4.5 SENSITIVITY AND MAGNITUDE CRITERIA FOR MATERIALS AND WASTE

- 26.4.5.1 The sensitivity of affected receptors will be assessed on a scale of very high, high, medium, low and negligible, as set out in Table 26.2.

**Table 26.2 - Sensitivity criteria**

<b>Sensitivity</b>	<b>Materials</b> <b>The construction materials required for the Proposed Development...</b>	<b>Waste</b> <b>Regional landfill capacity to 2023 is forecast to...</b>
<b>Negligible</b>	<p>Are readily available through regional supply</p> <p>Are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock</p> <p>Comprise a significant or industry-recognised best practice proportion of reused or recycled content</p>	<p>Remain relatively unchanged (less than 0.1% reduction in capacity), or an increase in capacity has been identified</p>

<b>Sensitivity</b>	<b>Materials</b> <b>The construction materials required for the Proposed Development...</b>	<b>Waste</b> <b>Regional landfill capacity to 2023 is forecast to...</b>
	Offer highly sustainable features and benefits compared to traditional materials	
<b>Low</b>	<p>Are readily available through regional supply</p> <p>Are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock</p> <p>Comprise a high or industry-recognised good practice proportion of reused or recycled content</p> <p>Offer sustainable features and benefits compared to traditional materials</p>	Reduce slightly, less than 1% reduction in capacity.
<b>Medium</b>	<p>Are generally available through regional supply, though some national (or wider) sourcing may be required</p> <p>Are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock</p> <p>Incorporate some proportion of reused or recycled content</p> <p>Offer some sustainable features and benefits compared to traditional materials</p>	Reduce considerably, between 1% and 50% reduction in capacity.
<b>High</b>	<p>Are generally not available through regional supply, and national (or wider) sourcing is substantially required</p> <p>Are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock</p> <p>Comprise of little or no reused or recycled content</p> <p>Offer little or no sustainable features and benefits compared to traditional materials</p>	Reduce significantly, between 50% and 90% reduction in capacity, and project waste requires disposal outside of the region.
<b>Very high</b>	Are available only through national (and wider) supply	Reduce very significantly (between

<b>Sensitivity</b>	<b>Materials</b> <b>The construction materials required for the Proposed Development...</b>	<b>Waste</b> <b>Regional landfill capacity to 2023 is forecast to...</b>
	<p>Are known to be insufficient regarding supply and stock</p> <p>Comprise no reused or recycled content</p> <p>Offer no sustainable features and benefits compared to traditional materials</p>	<p>90% and 100% reduction in capacity), require over 50% of project waste to be disposed outside of the region, or require new (permanent) waste infrastructure to be constructed to accommodate waste.</p>

26.4.6

The magnitude of change will be assessed on a scale of major, moderate, minor, negligible and no change, as set out in Table 26.3.

**Table 26.3 – Magnitude of change criteria**

<b>Magnitude</b>	<b>Materials*</b>	<b>Waste</b>
<b>High</b>	>50% of primary materials to be sourced <i>internationally</i> and/or	>1% reduction or alteration in <i>national</i> capacity of waste infrastructure, as a result of accommodating waste from a project
<b>Moderate</b>	Sterilises ≥1 mineral safeguarding site and/or peat resource	>1% reduction or alteration in the <i>regional</i> capacity of waste infrastructure as a result of accommodating waste from a project
<b>Low</b>	>50% of primary materials to be sourced <i>nationally</i> (with other primary materials sourced at a lower geographic scale)	>1% reduction or alteration in the <i>regional</i> capacity of waste infrastructure as a result of accommodating waste from a project
<b>Negligible</b>	Requires ≤50% of primary materials to be sourced nationally (with other primary materials sourced at a lower geographic scale)	≤1% reduction or alteration in the regional capacity of waste infrastructure

Magnitude	Materials*	Waste
<b>No change</b>	No reduction or alteration in the availability of material assets at a regional scale in relation to the resources the project will use	No reduction or alteration in the capacity of waste infrastructure at a regional scale
<b>Notes</b>	* for materials: magnitude of impact may be reduced wherever non-renewable/virgin/primary material consumption is reduced e.g. through use of recycled/secondary content, or materials with sustainable features	

## 26.4.7 SIGNIFICANCE CRITERIA

### 26.4.7.1

The significance level attributed to each effect has been determined by comparing the magnitude of change due to the Proposed Development, with the sensitivity of the affected receptor. In order to assign a significance of effect category to assessed materials, arisings and waste, the information in Table 2.4 in DMRB Volume 11 Section 2 Part 5 HA 205/08 (Highways Agency, 2008) (as replicated in Table 26.4) has been applied.

**Table 26.4 – Matrix to assign significance of effect category**

		Magnitude of change				
		No change	Negligible	Low	Moderate	High
Sensitivity	Very High	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

### 26.4.7.2

The descriptions provided in Table 26.5 have been used to define the significance of effect from each element (materials, arisings, waste) assessed.

**Table 26.5 – Definitions for significance of effect**

<b>Effect category</b>	<b>Description of Effect</b>	<b>Significant</b>
<b>Very Large</b>	Potential for extremely detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.	Yes
<b>Large</b>	Potential for considerable detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.	
<b>Moderate</b>	Potential for noticeable detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.	
<b>Slight</b>	Potential for limited or barely perceptible detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.	No
<b>Neutral</b>	No detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.	

## 26.4.8 ASSUMPTIONS AND LIMITATIONS

- 26.4.8.1 This chapter provides preliminary information only. It relates to the Proposed Development as currently understood and to data currently available and gathered prior to the publication of this document.
- 26.4.8.2 The information contained herein is intended to inform consultation responses. A more detailed assessment of potential impacts and significant effects, as a result of the Proposed Development on identified sensitive receptors, will be undertaken at subsequent stages to inform the ES.
- 26.4.8.3 Any gaps in information identified in this PEIR will be considered and addressed, along with specific mitigation measures, as part of the ES.
- 26.4.8.4 Baseline data and information for the assessment are (unless otherwise stated) only available to 2017.
- 26.4.8.5 UK landfill operators can claim commercial confidentiality for their data at time of submission; data for sites with a commercial confidentiality in place are therefore unavailable for the analyses presented in this chapter.
- 26.4.8.6 The Department of the Environment, Food and Rural Affairs ('Defra') has been previously consulted to determine whether generation and recovery rates for CDE arisings were available by region.

- 26.4.8.7 Defra confirmed that it does not publish CDE figures at a regional level, and only national (England) data are accessible through the publicly available Waste Data Interrogator Database; the database is held and operated by the Environment Agency. DEFRA in their response stated:
- “The methodology used to generate these figures is complex, in order to take into account the inherent double-counting and data gaps that are present within waste system data, and it would not be feasible to reproduce these on a regional basis.”*
- 26.4.8.8 Until such a time that CDE generation and recovery rates by region are available, transfer (non-civic), recovery and metal recycling data (available through the Waste Data Interrogator Database (Environment Agency, 2017)) will be used as the closest possible proxy.
- 26.4.8.9 Data to assess the predicted impact of the Proposed Development such as a detailed bill of quantities and estimates of waste generation and disposal route is currently unavailable beyond high level estimates. Further refined data will be available as the design progresses to allow the predicted impacts to be assessed further in the ES chapter.
- 26.4.8.10 An assessment of decommissioning is outside the scope of this chapter, however, it is presumed that good and best practice techniques will be applied at end-of-life in line with the increasing driver towards a circular economy and adverse environmental effects will be duly minimise at this lifecycle stage.

## 26.5 BASELINE ENVIRONMENT

- 26.5.1.1 This section describes the baseline for material consumption and waste generation and disposal for the current land uses (agricultural land, highways and car parks, and seafloor). It also provides regional and national information and data in the context of which the environmental impact assessment will be undertaken. Consequently, the baseline assessment includes Section 1 - Lovedean (Converter Station Area); Section 2 – 9 Onshore Cable Corridor; Section 10 – Eastney (Landfall); and Marine Cable Corridor.
- 26.5.1.2 The most up to date sources of available information have been used to collate data for material resource availability, landfill capacity and waste recovery. Indication of the most recent year from which data has been acquired has been provided throughout.

### 26.5.2 MATERIALS

#### Existing material requirements

- 26.5.2.1 The operation and maintenance of the existing highway and car park land uses are anticipated to be limited to works typically required for the maintenance and operation of the existing highway network and car parks. Materials are likely to include specialist components (e.g. light bulbs, signage steelwork, replacement barriers) as

well as some bulk material (asphalt for minor re-surfacing) for routine works and repairs of the highway and ancillary infrastructure. No significant consumption of construction material resources is considered likely for agricultural land use or the seafloor.

26.5.2.2 The current consumption of construction material resources on the land which the Proposed Development is proposed to be located is therefore deemed negligible as resources required for day to day maintenance and operation would be very limited in scale.

### **Availability of construction materials in South East England and UK**

26.5.2.3 Table 26.6 provides a summary of the availability of the main construction materials in South East England (Berkshire, Buckinghamshire, East Sussex, Hampshire, Isle of Wight, Kent, London, Oxfordshire, Surrey and West Sussex) and the UK, as required to deliver a typical cabling project. The overview provides the context in which the assessment of impacts and significant effects from material consumption from the Proposed Development has been undertaken.

**Table 26.6 – Construction materials availability in South East England and the UK**

<b>Material Type</b>	<b>South East</b>	<b>UK</b>
<b>Asphalt *</b>	4.3 Mt	27.3 Mt
<b>Concrete blocks #</b>	1.6 Mm <sup>2</sup> (Southern)	6.8 Mm <sup>2</sup>
<b>Copper ^</b>	(no data)	22,800 t (2014)
<b>Permitted crushed rock *</b>	0.1 Mt	144.5 Mt
<b>Plastic materials +</b>	(no data)	1.7 Mt (2015)
<b>Primary aggregate *</b>	30.2 Mt (2016) (London data 2014)	203 Mt
<b>Ready-mix concrete *</b>	6.1 Mm <sup>3</sup>	25.9 M m <sup>3</sup>
<b>Recycled and secondary aggregate*</b>	4.0 Mt (2016, no data coverage for London)	74 Mt
<b>Sand and gravel *</b>	17.7 Mt	61.7 Mt
<b>Steel +</b>	(no data)	8Mt (2016)
<i># stocks + production * sales ^ consumption</i> <i>Data availability: 2017 unless otherwise stated</i>		

Material Type	South East	UK
<i>Data from a range of sources: (Department for Business Energy &amp; Industrial Strategy, 2018); (South East Aggregates Working Party, 2016); (Minerals Products Association, 2016); (House of Commons Library, 2018); (London Aggregates Working Party, 2017); (Hampshire County Council, New Forest National Park, Portsmouth City Council, Southampton City Council and South Downs National Park, 2013)</i>		

26.5.2.4 The availability of construction materials typically required for cabling projects in South East England and across the UK, indicates that stocks/production/sales remain buoyant.

26.5.2.5 South East England has – in general – a higher availability of construction materials by comparison with other regions in England. The sensitivity of materials required for the Proposed Development is, accordingly, assessed to be low.

### 26.5.3 SITE ARISING

#### Site arisings currently generated

26.5.3.1 Current agricultural activities on the land where the indicative footprint of the Converter Station Area and ancillary development is proposed to be located are considered to have the potential to generate site arisings (such as earthworks, woodchip or rubble from demolished buildings). The highway, car park and seafloor land uses are considered to generate negligible arisings associated with minor repair works.

26.5.3.2 The regional context for an environmental assessment of arisings is provided below.

#### Transfer, treatment and metal recycling in South East England and England

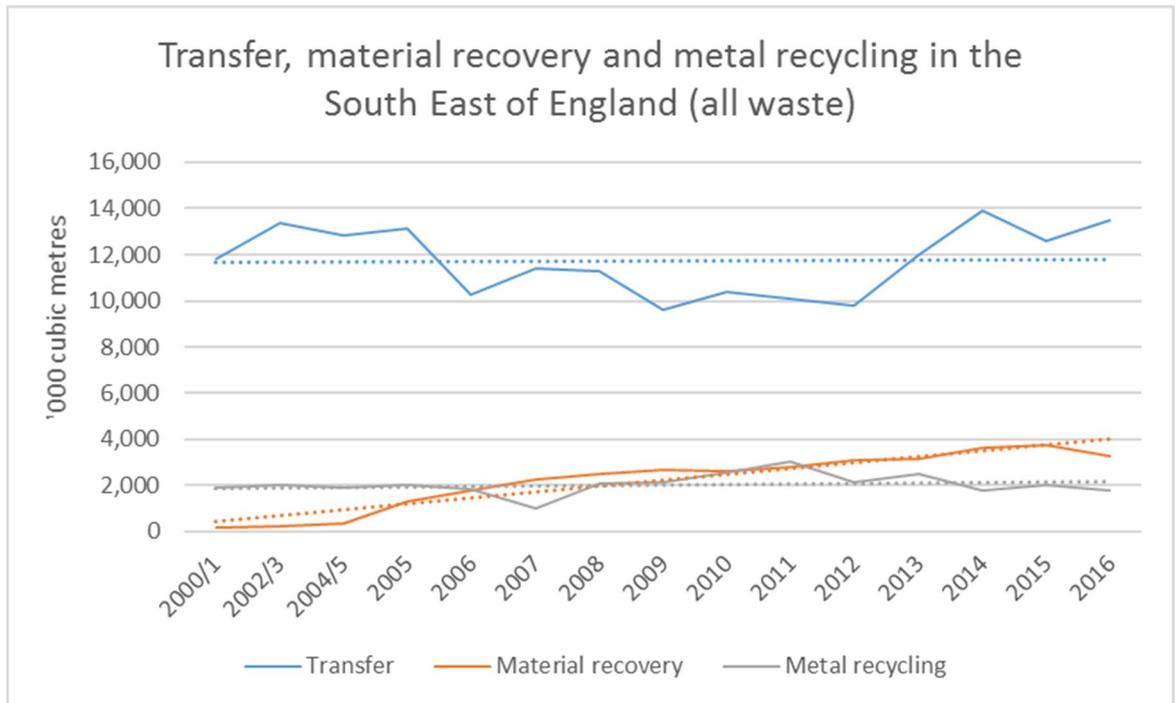
26.5.3.3 Defra data (ENV23 - UK Statistics on Waste) (Defra, 2018) (Table 26.7) shows that within England, the recovery rate for non-hazardous construction and demolition wastes has remained above 90% since 2010. This exceeds the EU target of 70%, which the UK must meet by 2020.

**Table 26.7 - Non-hazardous construction and demolition arisings recovery in England**

Year	Generation (Mt)	Recovery (Mt)	Recovery Rate (%)
2010	43.9	39.7	90.5%
2011	44.1	39.9	90.6%
2012	45.3	41.3	91.1%
2013	46.3	42.1	91.1%
2014	49.1	44.9	91.4%

26.5.3.4

No regional data for construction, demolition and excavation production or recovery rates are currently available for South East England. As such, data (Waste Management for England 2016) (Environment Agency, 2018) in Plate 26.2 are provided for all waste types in South East England and hence will include, but are not specific to, construction, demolition and excavation wastes. Data show that rates of material recovery in the region have - generally - risen steadily over the past 16 years. Transfer and metal recycling rates have, despite annual fluctuations, maintained a slightly increasing trendline, with a clear increasing trend observed in material recovery.



**Plate 26.2 - Transfer, materials recovery and metal recycling in South East England (2000/1 – 2016) (Waste Management for England 2016) (Environment Agency, 2018)**

26.5.3.5

Whilst trends for transfer, recovery and metal recycling in South East England display different characteristics, data indicate that there is likely to be regional infrastructure and capacity for the transfer and recovery of construction, demolition and excavation wastes from the Proposed Development. Construction and demolition recovery trends across England (Plate 26.2) and data in Table 26.8 confirms this assertion (Waste Management for England 2016) (Environment Agency, 2018).

**Table 26.8 - Permitted waste recovery management sites in South East England (2016)**

<b>Waste recovery facility type</b>	<b>Number of sites</b>	<b>Throughput (thousand tonnes)</b>
<b>Incineration</b>	38	4,409
<b>Transfer</b>	66	15,491
<b>Treatment</b>	531	16,680
<b>Metal recovery</b>	303	2,309
<b>Use of waste</b>	21	126
<b>Total</b>	1,509	39,015

26.5.3.6 The availability of materials recovery infrastructure in South East England, and across England, suggests that there is strong potential to divert from landfill sites, arisings generated by the Proposed Development.

## 26.5.4 WASTE

### Waste currently generated and disposed of

26.5.4.1 It is anticipated that wastes currently generated and disposed of within the land on which it is proposed the Proposed Development is located are negligible. The highway and car park elements are likely to generate small volumes of waste from routine maintenance and minor repairs. Wastes may include littering, light and signage replacement, replacement of reflective road studs (cats' eyes), vegetation from verge clearance and minor barrier refurbishments. No significant quantities of wastes are anticipated to be generated in relation to agricultural land or the seafloor.

26.5.4.2 The current generation of waste is therefore deemed to have a negligible impact in the context of available regional landfill capacity.

### Remaining landfill capacity in South East England

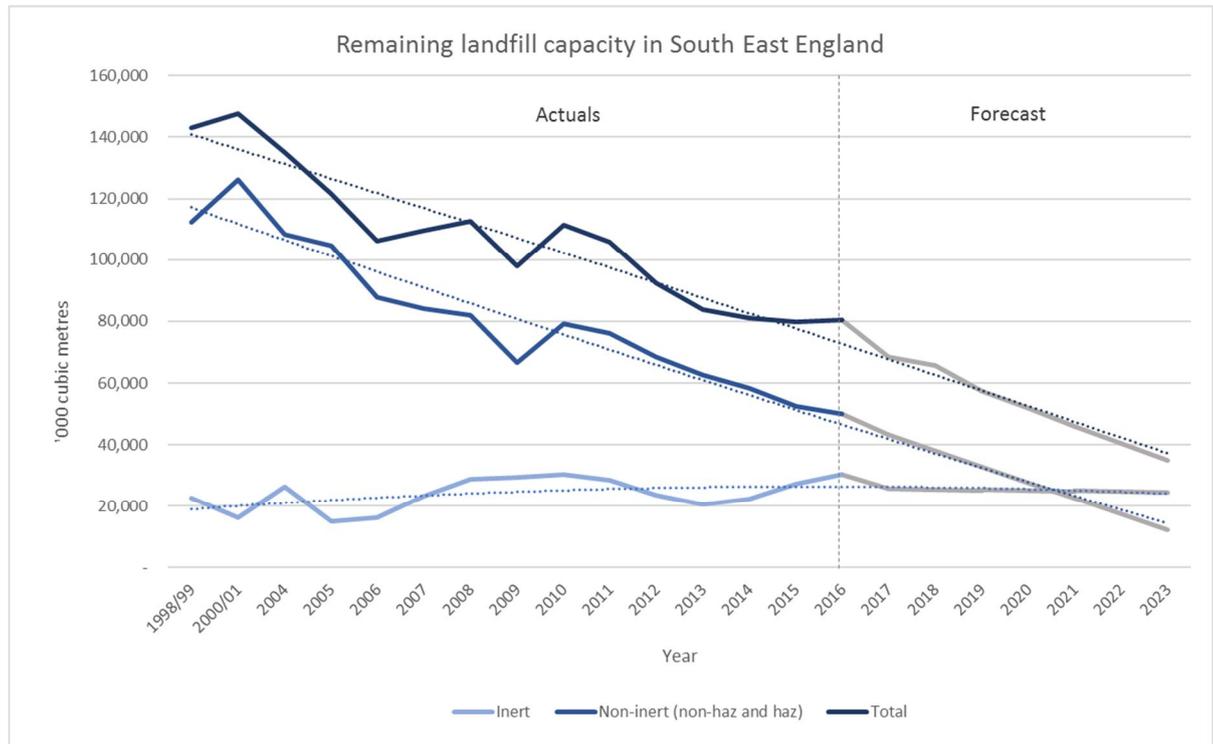
26.5.4.3 Environment Agency data (Remaining landfill capacity) (Environment Agency, 2018) confirmed at the end of 2017, 69 landfill sites in South East England were recorded as having 80.4 Mm<sup>3</sup> of remaining capacity. Data in Table 26.9 summarises this information by landfill type, and shows the change in capacity from 2016 to 2017.

**Table 26.9 - Remaining landfill capacity in South East England**

<b>Landfill type</b>	<b>Remaining capacity in 2016 (m<sup>3</sup>)</b>	<b>Remaining capacity in 2017 (m<sup>3</sup>)</b>	<b>2016 – 2017 capacity comparison (m<sup>3</sup>)</b>
<b>Hazardous (merchant and restricted)</b>	560,175	218,526	- 0.3 Mm <sup>3</sup>
<b>Inert</b>	30,312,783	29,465,308	- 0.8 Mm <sup>3</sup>
<b>Non-hazardous (including stable hazardous waste cells)</b>	49,555,086	50,695,399	+ 1.1 Mm <sup>3</sup>
<b>Total</b>	80,428,044	80,379,233	- 0.05 Mm <sup>3</sup>

26.5.4.4 The 2013 Hampshire Minerals and Waste Plan (Hampshire County Council, New Forest National Park, Portsmouth City Council, Southampton City Council and South Downs National Park, 2013) estimates that an additional 1.8 Mm<sup>3</sup> of non-hazardous landfill capacity would be required until the end of the plan period in 2030, although no specific proposal for the development of additional and fill capacity is stated within the Plan.

26.5.4.5 Baseline regional capacity is detailed in Plate 26.3. Simple statistical forecasting (using the Microsoft Excel forecasting function) has been used to demonstrate long term void capacity to the first year of operation (2023) in the absence of future provision.



**Plate 26.3 - Landfill capacity in South East England**

26.5.4.6

Baseline data indicate that total land fill capacity and non-inert landfill capacity is likely to become an increasingly sensitive receptor over the life of the proposed development to the first full year of operation. Inert landfill capacity has been relatively constant, however a slight decrease in capacity is shown in the forecast data. Plate 26.3 shows that waste capacity in South East England is forecast to reduce by as much as 18% (inert landfill capacity), 76% (non-inert landfill capacity), and 56% (total landfill capacity) from 2016 to 2023, in the absence of future provision.

26.5.4.7

Individually, the sensitivity of different landfill capacity types over the lifetime of the Proposed Development is assessed to be **medium** (for inert waste landfill capacity), **high** (for non-inert waste landfill capacity) and **high** (for total (all waste types) landfill capacity). Overall, the sensitivity of landfill capacity is assessed to be **high**.

## 26.5.5

### FUTURE BASELINE

#### Material Resources

In the future baseline it is anticipated that there will be no change to the scale and nature of the repair and maintenance works currently required in the 'do nothing' scenario. The quantity of materials consumed in the future baseline is expected to remain negligible. Given that South East England generally has a higher availability of construction materials in relation to other regions in England and the Local Policies in place in the Hampshire Minerals and Waste Plan development, it is anticipated that stocks/production/sales will remain buoyant in the future baseline.

## Waste Generation and disposal

26.5.5.1 In the future baseline it is anticipated that there will be no change to the scale and nature of the repair and maintenance works currently required in the ‘do nothing’ scenario. In the future baseline landfill capacity will continue to decline in the absence of future provision. However, the volume of waste generated in the future baseline is expected to remain negligible in the context of available regional capacity.

## **26.6 PREDICTED IMPACTS**

26.6.1.1 The Proposed Development has the potential to consume material resources (including those recovered from site arisings), and produce and dispose of waste during the demolition, site preparation, and construction stages of the Converter Station, Onshore Cable Route, Landfall and Marine Cable Route elements.

26.6.1.2 The associated potential environmental impacts (both direct and indirect) will occur principally during construction, and potentially in the first year of operation. Impacts arising further into the operational lifecycle are expected to be negligible, and have therefore been scoped out of this chapter and further assessment.

26.6.1.3 The impacts during construction and the first year of operation will be associated with the production, processing, consumption and disposal of material resources.

26.6.1.4 The impacts of the Proposed Development on material resources (including recovered site arisings) and waste generation and disposal, are likely to occur on-site, off-site within the UK and, potentially, internationally.

26.6.1.5 Table 26.10 summarises the impacts associated with materials consumption, and waste generation and disposal.

**Table 26.10 – Significant environmental impacts associated with materials and waste**

<b>Element</b>	<b>Direct Impacts</b>	<b>Indirect impacts</b>
<b>Materials</b>	Consumption of natural and non-renewable resources	Release of greenhouse gas emissions Water consumption and scarcity Nuisance to communities (visual, noise, health)
<b>Waste</b>	Generation and disposal of waste	Release of greenhouse gas emissions Nuisance to communities (visual, noise, health)

## 26.6.2 CONSTRUCTION

- 26.6.2.1 The potential impacts associated with material resource consumption and waste generation and disposal during the construction of the Proposed Development are reported in Table 26.11 in accordance with IAN 153/11 Table C of Annex 2 – Detailed Assessment Reporting Matrix.
- 26.6.2.2 At the current design stage, a bill of quantities and anticipated quantities of waste generation has not been prepared to provide detailed information of anticipated material resource consumption. As such, high level estimates have been prepared by the WSP Design Team which will be refined further as the design progresses.

**Table 26.11 – Detailed Assessment Reporting Matrix: Construction**

<b>Project activity</b>	<b>Potential impacts associated with material resources/waste</b>	<b>Description of the impacts</b>
<b>Demolition</b>	<p><b>Material consumption</b></p> <p>No materials are anticipated to be consumed during demolition activities. Therefore, no adverse impacts are anticipated associated with material during the demolition phase.</p>	<p>No adverse impacts anticipated.</p> <p>The magnitude of change is anticipated to be <b>no change</b>.</p>
	<p><b>CDE arisings and waste generation</b></p> <p>It is currently anticipated that no demolition of existing structures is required on the agricultural land, existing highways and car parks associated with the proposed Converter Station, Onshore Cable Route and Landfall location.</p>	<p>On the basis that no demolition is required, no potential adverse impacts are therefore identified.</p> <p>The magnitude of change is anticipated to be <b>no change</b>.</p>
<b>Site remediation /preparation</b>	<p><b>Material consumption</b></p> <p>Material resources for the Converter Station are anticipated to be comprise:</p> <ul style="list-style-type: none"> <li>· Timber or steel perimeter fencing (unconfirmed quantity)</li> <li>· Granular material (aggregate) for temporary laydown areas and the initial access road development. Initial estimates suggest that 20,000 m<sup>3</sup> will be required.</li> </ul> <p>No material resources are anticipated for the preparation of the Onshore Cable Route aspects.</p> <p>Marine material resources associated with site preparation are anticipated to comprise:</p>	<p>Any impacts associated with material resource consumption would be limited for this activity, but would be adverse, permanent and direct.</p> <p>Based on the preliminary design information and using professional judgement, the magnitude of change is anticipated to be <b>Low</b>, but will be re-assessed during the ES.</p>

Project activity	Potential impacts associated with material resources/waste	Description of the impacts
	<ul style="list-style-type: none"> <li>Imported rock for mattresses and berms. Quantities required for mattresses are currently unconfirmed but likely to occur over 10km of the route. Imported rock for the crossing preparation berms are anticipated to require approximately 300 m<sup>3</sup> of imported rock.</li> </ul> <p><b>CDE arisings and waste generation</b></p> <p>In relation to the indicative Converter Station location, it is currently anticipated that all efforts will be made to equalise the cut and fill balance with earthwork arisings being re-used on site for landscaping and bunding. Initial estimates indicate that approximately 50,000 m<sup>3</sup> of material will be cut, of which 45,000 m<sup>3</sup> will be used for landscape mitigation. The remaining 5,000 m<sup>3</sup> will be spread over the entire site to minimise any off-site disposal.</p> <p>The granular materials used for temporary laydown areas will require removal to reinstate the land to agricultural use. Approximately 175,000 m<sup>3</sup> will require removal, however the disposal route (recovery or landfill) is currently undetermined, but anticipated to be recovered and therefore diverted from landfill.</p> <p>No waste arisings are anticipated in relation to site preparation for the Onshore Cable trenching activities.</p> <p>Marine CDE arisings and waste generation are likely to be associated with the clearance of obstacles, boulders and other sea bed features, sandwaves and large ripples and other debris.</p>	<p>Where any site arisings cannot be diverted from landfill, the impacts associated with disposal of waste would be adverse, permanent and direct. CDE arisings which can be re-used either on or off site will reduce the impact of waste disposal to landfill.</p> <p>Based on the preliminary design information and using professional judgement, the magnitude of change is anticipated to be <b>Low</b>, but will be re-assessed during the ES.</p>

Project activity	Potential impacts associated with material resources/waste	Description of the impacts
	<p>Worst case scenario estimates for the marine preparation aspects suggest that arisings and wastes will comprise:</p> <ul style="list-style-type: none"> <li>· 1.7M m<sup>3</sup> of sea bed sediment will be removed, but deposited within the Marine Cable Corridor negating any disposal of materials to landfill.</li> <li>· Removal of boulders (quantity unknown) to be recovered for reuse outside of the Proposed Development and therefore diverted from landfill.</li> <li>· Arisings from horizontal directional drilling (estimated at 2,700 m<sup>3</sup> of rock) are anticipated to be recovered for reuse outside of the Proposed Development and therefore diverted from landfill.</li> <li>· Redundant existing service cables (approximately 10 are understood to be present) will be removed for onshore disposal. The disposal route is currently unconfirmed.</li> </ul>	
<b>Construction</b>	<p><b>Material consumption</b></p> <p>The Onshore Construction Stage comprises the construction of the Converter Station and associated infrastructure, excavation of trenches for cabling and reinstatement of the trench. This Stage is likely to see the greatest use of primary and secondary materials (natural and non-renewable).</p> <p>Estimates of material quantities for the Converter Station are currently unavailable at this stage of the design, however, anticipated bulk construction material types include concrete</p>	<p>Any impacts associated with material resource consumption would be adverse, permanent and direct. The re-use of CDE arisings (from on or off-site sources) would reduce the adverse impact of materials resource consumption</p> <p>Based on the preliminary design information and using professional</p>

Project activity	Potential impacts associated with material resources/waste	Description of the impacts
	<p>(foundations, slabs, firewalls), steel (structural aspects, reinforcement and possibly cladding), aluminium (structural support and possibly cladding), cement bound sand, granular stone fill material and stone chippings. Other ancillary materials such as plastic drainage, steel fencing, windows, plasterboard and insulation will also be required.</p> <p>The Onshore Cable Route is estimated to require:</p> <ul style="list-style-type: none"> <li>• 640 m<sup>3</sup> of cement bound sand per km of the route. Over the 20 km route this is expected to comprise 12,800 m<sup>3</sup>.</li> <li>• 460 m<sup>3</sup> road course (asphalt) per km of the route. Over the 20 km route this is expected to comprise 9,200 m<sup>3</sup>.</li> </ul> <p>The Marine Construction Stage will require construction material resources associated laying approximately 108 km cables. Worst case scenario estimates in the region of:</p> <ul style="list-style-type: none"> <li>• 4050 m<sup>3</sup> of imported rock for post-lay berms and HDD exit/entry point protection, plus additional imported rock (unconfirmed quantity) for rock placement;</li> <li>• 68,400 m<sup>3</sup> concrete/plastic frond mattresses; and</li> <li>• 4 no. 24 m steel or plastic ducts installed at landfall.</li> </ul> <p><b>CDE arisings and waste generation</b></p> <p>In relation to the Onshore aspects, it is currently anticipated that all efforts will be made to equalise the cut and fill balance with</p>	<p>judgement, the magnitude of change is anticipated to be <b>Low</b>, but will be re-assessed during the ES.</p> <p>Where any site arisings cannot be diverted from landfill, the impacts associated with disposal of waste would be adverse, permanent and</p>

Project activity	Potential impacts associated with material resources/waste	Description of the impacts
	<p>earthwork arising being re-used on site for landscaping and bunding.</p> <p>During the Construction Stage, measures to minimise waste arisings will include off-site fabrication of steel structures and cladding, preparation of steel reinforcement to suit the bar banding schedule of the site and design measures to avoid over specification of concrete and quality control to avoid re-working of concrete. Estimates of potential waste generation cannot be quantified at present, however given the initial design and measures proposed, minimal waste generation is anticipated and recovery measure will be implemented to further minimise any waste disposal to landfill.</p> <p>For the Onshore Cable Route, it is anticipated that, due to the absence of suitable storage locations, arisings removed to form the trench will need to be disposed of as waste. The arisings will comprise bituminous material, aggregate and earthworks. This is estimated to be in the region of 2,100 m<sup>3</sup> per km of route, which over the 20 km route equates to 42,000 m<sup>3</sup>. It is anticipated that in line with best practice, the arisings will be diverted from landfill where possible.</p> <p>Worst case scenario estimates of arisings and waste generated from the marine aspects of the Proposed Development, are likely to comprise:</p> <ul style="list-style-type: none"> <li>114,250 m<sup>3</sup> of marine sediment from trenching activities for cable burial. This material would be deposited on the seabed and therefore diverted from landfill.</li> </ul>	<p>direct. CDE arisings which can be re-used either on or off site will reduce the impact of waste disposal to landfill.</p> <p>Based on the preliminary design information and using professional judgement, the magnitude of change is anticipated to be <b>Low</b>, but will be re-assessed during the ES.</p>

26.6.2.3 As the Proposed Development is in the early stages of design, quantified estimates of the materials required, arisings suitable for re-use or recycling, and waste disposal to landfill during the Onshore and Marine construction phases are currently high-level estimates. These quantities will be refined as the Proposed Development design progresses.

**26.6.3 OPERATION**

26.6.3.1 The potential impacts associated with material resource consumption and waste generation and disposal during the operation (considered only for the first full year of operation) of the Proposed Development are reported in Table 26.12 in accordance with IAN 153/11 Table C of Annex 2 – Detailed Assessment Reporting Matrix.

**Table 26.12 – Detailed Assessment Reporting Matrix: Operation**

<b>Project activity</b>	<b>Potential impacts associated with material resources/waste</b>	<b>Description of the impacts</b>
<b>Operation and maintenance (during first full year of operation only)</b>	<p>Material consumption</p> <p>Minimal quantities of materials are anticipated to be required during the first year of operation as minimal maintenance requirements are anticipated for both the marine and onshore aspects of the Proposed Development.</p>	<p>Any impacts associated with material resource consumption would be adverse, permanent and direct.</p> <p>Using professional judgement, the magnitude of change is anticipated to be negligible based on the likelihood that minimal quantities of materials will be required for operation and maintenance.</p>
	<p>CDE arisings and waste generation</p> <p>It is currently considered likely that minimal waste will be generated during operation as the Converter Station will be an unmanned facility; no significant waste generation from the road or car park locations is expected; and the Onshore and Marine Cables have been designed to not require any maintenance.</p>	<p>Where any site arisings cannot be diverted from landfill, the impacts associated with disposal of waste would be adverse, permanent and direct. CDE arisings which can be re-used either on or off site will reduce the impact of waste disposal to landfill.</p> <p>Using professional judgement, the magnitude of change is anticipated to be negligible.</p>

## 26.6.4 DECOMMISSIONING

26.6.4.1 Materials consumption, and arisings and waste production beyond the first full year of operation have been scoped out, as their impacts and associated effects have been deemed to be not significant. Furthermore, the materials required for, and disposal routes of waste generated are not known as they are deemed to be too far into the future. Accordingly, this chapter and its assessment have been produced on the presumption that - through the advancement of technologies and processes for reclaiming and recovering materials in the future this Project will take into account the increasing drive towards a circular economy - good and best practice techniques will be applied at end-of-life and adverse environmental effects will be duly minimise at this lifecycle stage.

## 26.6.5 CUMULATIVE IMPACT ASSESSMENT

26.6.5.1 The potential for cumulative impacts has been considered for the construction and operation stages of the Proposed Development.

26.6.5.2 A possible cumulative adverse effect for material consumption and waste disposal could exist where the construction period of the Proposed Development and any other development overlaps. The cumulative impact for material consumption would be greatest where similar construction materials are required, for example in relation to electrical substations, road infrastructure. The cumulative impact for waste disposal (reduction in landfill capacity), would depend on the quantity and type of waste destined for disposal to landfill, and the management techniques deployed.

26.6.5.3 Whilst the occupation of large housing developments (circa 2,550 dwellings (Grainger Development Site 10/02862/OUT) as detailed in Appendices 28.1 and 28.2) is likely to increase the sensitivity of landfill capacity through the generation of municipal waste, operational waste generation from the Proposed Development is considered to be negligible, and therefore no cumulative impact is considered. Similarly, negligible material consumption is expected during the operation of the Proposed Development.

## 26.7 PROPOSED MITIGATION

26.7.1.1 Specific measures that have been identified that would mitigate any adverse impacts from materials consumption and the generation and disposal of waste, and that will maximise benefits derived from re-use/recycling of arising's, include:

- Completion of ground and local environment inspections and surveys to determine the nature of the ground, to identify its potential to be diverted from landfill;
- Where appropriate, the use of HDD or other trenchless techniques to minimise the need to generate open trenches;
- Spoil and rubbish segregation and containment on temporary laydown areas;

- A drive to balance cut and fill at the indicative Converter Station location. For example, materials excavated on higher parts of the site will be used to fill lower levels to minimise export. The option to increase the excavated material cut from the site to decrease the overall visual impact of the building will also be investigated;
- The design and construction aspects will follow British Standard 8895 (Designing for material efficiency in building projects) and other published guidance such as BRE materials resource efficiency in construction;
- Off-site fabrication will be utilised where practicable;
- Sufficient storage space will be allocated by the construction contractor to allow waste to be properly segregated;
- The construction contractor will, where possible, order material with less or returnable packaging;
- Both Onshore and Marine Cables designed so as to not require regular maintenance;
- The proposed Converter Station will (at end of life) be decommissioned in accordance with the current waste disposal regulations in force at that time;
- At the end of the Marine Cable's 40-year design, the options for decommissioning will be evaluated. In some instances, the least environmentally impacting option may be to leave the cable in-situ. The final decommissioning plan is still to be determined, and will depend on requirements and the marine environment at the time;
- When decommissioning Onshore Cables, every effort will be made to re-use and recycle as much material as possible; and
- Monitoring measures to be adopted across the Proposed Development would include, as a minimum, the implementation of a CEMP, incorporating a Materials Management Plan ('MMP') and Site Waste Management Plan ('SWMP') by the contractor. Associated data, information and reports will be used to evidence monitoring undertaken.

#### 26.7.1.2

Examples of other potential design, mitigation and enhancement measures to mitigate adverse impacts from materials consumption and the generation and disposal of waste, and to encourage beneficial outcomes from the recovery and reuse of site arisings are set out in Table 26.13.

**Table 26.13 – Potential design, mitigation and enhancement measures**

<b>Element</b>	<b>Enhancement and mitigation measures</b>	<b>Application lifecycle stage</b>
<b>Materials resources</b>	Identification and specification of materials that can be acquired responsibly, in accordance with BES 6001 Responsible Sourcing of Construction Products (British Research Establishment (BRE), 2014).	Detailed design, construction
	Design for resource optimisation: simplifying layout and form, using standard sizes, balancing cut and fill, maximising the use of renewable materials, and materials with recycled or secondary content, and setting net importation as a Proposed Development goal.	Detailed design
	Design for off-site construction: maximising the use of pre-fabricated structures and components, encouraging a process of assembly rather than construction	Detailed design
	Design for the future: considering how materials can be designed to be more easily adapted over an asset lifetime, and how deconstructability and demountability of elements can be maximised for decommissioning/at end-of-first-life.	Detailed design
<b>Site arisings</b>	Design for recovery and re-use: identifying, securing and using materials at their highest value, whether they already exist on site, or are sourced from other schemes.	Detailed design
	Identify opportunities to minimise the export and import of materials.	Detailed design, construction
	Working to a proximity principle, ensuring arisings generated are handled, stored, managed and re-used or recycled as close as possible to the point of origin.	Detailed design, construction
	Identify areas for stockpiling and storing arisings that will minimise quality degradation and leachate, and will minimise damage and loss.	Detailed design, construction
	Ensure potential arisings and waste are properly characterised before or during design, to maximise the potential for highest value reuse.	Detailed design

Element	Enhancement and mitigation measures	Application lifecycle stage
Waste to Landfill	Engage early with contractors to identify possible enhancement and mitigation measures, and to identify opportunities to reduce waste through collaboration and regional synergies.	Detailed design, Procurement

## 26.8 SUMMARY AND CONCLUSIONS

26.8.1.1 This chapter provides preliminary information regarding the impact of the Proposed Development on waste and material resources. The chapter considers the potential for impacts associated with the consumption of materials and products to arise, including the generation and use of arisings recovered from the whole Proposed Development, and production and disposal of waste to landfill.

### 26.8.2 BASELINE

26.8.2.1 South East England has, in general, a higher availability of construction materials by comparison with other regions in England. The sensitivity of materials required for the Proposed Development is, accordingly, assessed to be **low**).

26.8.2.2 Baseline data indicates that total and non-inert landfill capacity is likely to become an increasingly sensitive receptor over the life of the proposed development to the first full year of operation. Individually, the sensitivity of different landfill capacity types over the lifetime of the Proposed Development is assessed to be **medium** (for inert waste landfill capacity), **high** (for non-inert waste landfill capacity) and **high** (for total (all waste types) landfill capacity). On average, the sensitivity of landfill capacity is assessed to be high.

### 26.8.3 ASSESSMENT AND MITIGATION

26.8.3.1 Potential effects of the Proposed Development will be fully assessed in the ES, however it is currently expected that the most significant material consumption will occur during construction (as opposed to during site preparation, or operation). The most significant waste generation is likely to occur during site preparation and construction due to the inherent nature of those activities. Any impacts associated with material resource consumption and waste arising which cannot be diverted from landfill would be adverse, permanent and direct.

26.8.3.2 Specific design, mitigation and enhancement measures confirmed at the time of publication, include measures to divert waste from landfill during construction, use construction techniques to minimise material consumption, balance cut and fill at the Converter Station, use cables which are designed to reduce maintenance and consideration of end of life (decommissioning) techniques to minimise waste to landfill.

#### **26.8.4 CONCLUSION**

26.8.4.1 Any residual effects will be presented in the ES chapter once the effects of the Proposed Development have been assessed.

#### **26.9 ASSESSMENTS AND SURVEYS STILL TO BE UNDERTAKEN**

26.9.1.1 The waste and materials resources assessment requires further details on following aspects, in order to carry out an assessment:

- The types and quantities of materials to be consumed (e.g. through a Bill of Materials or Schedule of Rates) during construction including details of likely sources of materials and recycled content;
- The types and volumes of CDE arisings to be generated during construction of the Proposed Development, including information on how a cut and fill balance can be achieved; and
- The type and volumes of waste to be sent or diverted from landfill during the construction and first year of operation of the Proposed Development, including the likely destination of the landfill/waste management facility.

## REFERENCES

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