

Chapter Nineteen ♦ Waste and Materials

INTRODUCTION

- 19.1 This chapter presents the assessment completed for the Preliminary Environmental Information Report (PEIR). The chapter presents the preliminary assessment of likely significant environmental effects of the Proposed Development with respect to solid waste and materials management. Further assessment work will be undertaken prior to submission of the DCO application, to update the assessment which will be presented in the Environmental Statement. This chapter describes the methods used to assess the effects, the baseline conditions, the mitigation measures required to prevent, reduce or offset any likely significant adverse effects, and the likely residual effects after mitigation measures have been adopted.
- 19.2 The Proposed Development has the potential to generate a significant quantity of waste during its construction and operation and has the potential to place significant demands on the existing waste infrastructure. Equally, there is growing pressure nationally to reduce material consumption and maximise opportunities to reuse and recycle waste. This PEIR chapter provides the following:
- Review of relevant policies and guidance that has informed the assessment
 - Review of existing baseline conditions
 - Preliminary assessment of likely solid waste and materials effects associated with the Proposed Development.
- 19.3 This chapter focuses on operational as well as excavation, demolition and construction waste from the Proposed Development. The materials management assessment focuses on the construction stage. A draft Operational Waste Management Plan (OWMP) and Site Waste Management Plan (SWMP) will be produced as part of the EIA and included within the ES.

METHODOLOGY AND DATA SOURCES

EIA scoping

- 19.4 An EIA scoping report was submitted to the Planning Inspectorate on the 15th June 2020. This set out the proposed approach to assessing solid waste and materials management effects in relation to the Proposed Development.
- 19.5 The EIA Scoping Opinion is due to be received at the end of July 2020, all comments

received from the Secretary of State and other consultees will be given due consideration and addressed in the assessment contained within the ES chapter submitted with the DCO application.

19.6 The 2014 Scoping Opinion on waste is summarised with responses in Table 19.1.

Table 19.1: Summary of comments from the 2014 Scoping Opinion report relevant to waste for the Kent Project Site.

Scoping opinion section	2014 Scoping opinion comment	2020 Response
3.83	"...production of a range of different types of waste throughout the construction, operational and decommissioning phases of the development. The applicant's Site Waste Management Plan (SWMP) should be appended to the ES."	Noted and will be addressed in both the ES and SWMP document.
3.84	The Secretary of State encourages the applicant to discuss their proposed approach with the EA and the relevant waste disposal authority, as well as the MMO if intending to dispose of dredged material in the marine environment, to establish an appropriate methodology and evaluation criteria and ensure that all types of wastes and their effects are considered. The applicant should note that KCC highlight the planned adoption of the emerging Kent Minerals and Waste Local Plan 2013-30 in 2015 in their response in Appendix 2.	Noted and will be implemented in the ES chapter.
3.85	It is essential that the assessment accounts for materials to be removed from the site and to identify where potential traffic movements would be routed. Such details should also be reflected in relevant supporting documents (e.g. the SWMP).	Noted and will be addressed in both the ES and SWMP document.
3.86	Where the re-use of construction waste on site is proposed to minimise the need for the export and import of material the ES should describe the method used to calculate the likely cut and fill balance of material.	Noted and will be addressed in both the ES and SWMP document.

3.87	Some of the effects linked to waste (e.g. on air or water quality) would be covered in other chapters of the ES. The interrelationship between the chapter on waste and these other chapters should be clearly explained in the ES and cross referenced, where appropriate.	Noted and will be implemented in the ES chapter.
3.88	The ES should describe any mitigation measures necessary to deal with adverse impacts and identify any residual effects. The ES should also make it clear how mitigation measures would be secured and delivered in the DCO.	Noted and will be implemented in the ES chapter

Consultation

- 19.7 As part of the consultation process for waste and materials, the local authorities of
- 19.8 Kent, Dartford, Gravesham, Thurrock, Essex and Ebbsfleet Development Corporation will be consulted in relation to the emerging strategy, mitigation and residual impacts for waste and materials management from the Proposed Development and will be undertaken as part of the ES.
- 19.9 For the development of the OWMP four private waste companies active in the region have been approached as part of the consultation process. As of early July 2020, first consultation meetings have been conducted with Cory Riverside Energy and Veolia. The companies have confirmed an interest to accept certain operational waste streams from the Proposed Development, subject to the agreement of commercial terms for such a service. They also provided valuable input in regard to emerging mitigation measures for waste management. Further consultation will be carried out prior to the submission of the DCO application.

Study area

- 19.10 The study area of this assessment includes three different areas of Kent, Essex and Thurrock. The location of the Proposed Development has two sites, with the main area at the Swanscombe Peninsula, in the county of Kent, known as the Kent Project Site. The second site, which includes mainly car parking and transport links on the other side of the River Thames at the Port of Tilbury, within the unitary authority of Thurrock, known as the Essex Project Site. Thurrock is a unitary authority within Essex, however for the baseline Thurrock and Essex have been included, in addition to Kent as waste generation and material demand are expected to affect the local and wider area.
- 19.11 This assessment considers waste generated within the Project Site and the effects that it may have on waste management infrastructure at local and regional levels. The waste that is generated off-site but is linked to the Proposed Development (for example waste from the manufacturing process of materials used on-site), is outside the scope of this assessment. The geo-environmental impact from excavated material has been assessed in Chapter 18, waste water has been assessed in Chapter 17 and transport in Chapter Nine

of the PEIR.

Baseline study methodology

- 19.12 A desktop study will be undertaken in order to determine the baseline conditions. The spare capacity of the current waste management infrastructure in Kent and Essex (including Thurrock where information is available) were determined by using data relating to maximum capacities and current usage as publicly available.
- 19.13 The definition of a baseline with regards to waste management is set in relation to the latest estimated waste generation amounts in the Kent and Essex (including Thurrock) areas. Data concerning waste management practices, infrastructure capacity and generation was largely drawn from the following sources:
- Local Plans and frameworks;
 - Annual monitoring reports; and
 - DEFRA data for England.
- 19.14 A desktop study will be undertaken to review the existing buildings within the Project Site that will be demolished as part of the ES. This will include reviewing aerial footage along with available building data.

Assessment approach

- 19.15 The assessment of waste and materials effects associated with the Proposed Development are based on:
- The layouts and plans of the Proposed Development;
 - The Proposed Development size and outline composition mix (outline floor areas and land-use type). These have been used to estimate C&D waste generation figures. The number of daily visitors and the land use types have been used to determine the quantity of waste during the operation phase;
 - The development of an OWMP for the Proposed Development that will be submitted as part of the ES;
 - The development of a SWMP for the Proposed Development, this will provide details on the potential construction and demolition waste that will be submitted as part of the ES;
 - Anticipated volumes of key material requirements during the construction phase will be based on architectural land use plans; and

- Relevant local and regional waste and material management regulations and planning policies.

19.16 Construction waste estimations from the SWMP have been used in this chapter. Actual quantities and compositions may eventually differ from estimated quantities and compositions because of changes in the unpredictable variables that influence actual waste quantities and composition. These variables include:

- Eventual recycling systems and waste infrastructure available;
- individual contractor, resident or worker behaviour;
- changes to local policies and requirements.

19.17 Details on excavation will be provided in the soils, hydrogeology and ground conditions chapter. The potential to reuse excavation material on-site will be provided as part of the environmental assessment.

Assessment of effects

19.18 To assess sensitivity of receptors, magnitude of impact and significance of effects, the IEMA guide to materials and waste in EIAs (2020) has been used. It is acknowledged in the IEMA guidance that the document provides initial guidance. Where information is not available, in particular for materials and for demolition and excavation waste, professional judgement has been used to undertake the assessment.

19.19 The operational waste generation estimates have been compared with local available capacity of waste infrastructure and expected waste diversion to confirm the preliminary effect significance. In addition, the preliminary mitigation measures for the Project Site have been assessed in order to develop and evaluate the effects on local waste infrastructure.

19.20 The assessment of potential impacts and associated effects from material demand and utilisation includes a review of the type of materials required for the Proposed Development. Materials required for construction may include common construction materials such as concrete, steel, aggregate, asphalt bricks, timber etc. This assessment has targeted the main materials used only, for the PEIR this includes concrete and steel. Further materials will be considered as part of the ES. Detail of potential region(s) from where specific materials may be sourced will be included in the ES, as well as if any materials comprise of any recycled or secondary content.

Receptor sensitivity

19.21 The assessment of the receptor's sensitivity aims to determine and evaluate whether waste arising from the Proposed Development can be managed by the receptor. In order

to undertake this, the estimated spare capacity of the receptor is calculated outlined in Table 19.2 and is informed through quantitative data and professional judgement.

Table 19.2: Criteria for determining waste receptor sensitivity (IEMA, 2020).

Waste Receptor Sensitivity	Criteria
Very High	Reduce very considerably (by >10%), end during construction or operation, is known to be unavailable, or would require new capacity/infrastructure to be put in place to meet demand
High	Reduce considerably, by 6-10% as a result of wastes forecast
Medium	Reduce by 1-5%, as a result of wastes forecast
Low	Reduce minimally, by <1% as a result of wastes forecast
Negligible	Remain unchanged, or expected to increase through a committed change in capacity

19.22 The sensitivity of materials relates to the availability and type of resources to be consumed by a development. In this assessment, criteria from IEMA, have been used to determine the sensitivity of materials. The sensitivity can be determined using a sensitivity rating of Negligible to Very High, based of supply/stock of materials, as well as the sustainable properties of each material. The criteria are summarised in Table 19.3.

Table 19.3: Criteria for determining material receptor sensitivity (IEMA, 2020).

Material Receptor Sensitivity	Criteria
Very High	Insufficient in terms of production, supply and/or stock / not available with any sustainable features
High	Suffer from known issues with supply / stock /available comprising little to no sustainable features
Medium	Suffer from some potential issues with supply and stock / available comprising some sustainable features
Low	Generally free from known issues regarding supply and stock / available comprising high portion of sustainable features
Negligible	Free from known issues regarding supply and stock / available comprising of sustainable features

Magnitude of change / impact

19.23 The quantitative evaluation of the magnitude of waste change / impact is determined by comparing the waste arisings of the Proposed Development to the current waste levels in the area of influence.

19.24 The IEMA guidance provides criteria for assessing magnitude and provides two approaches to determine the magnitude of impact for waste. Method 1 determines void capacity of landfill, which is the most robust approach, suitable for larger developments

and statutory EIAs. It involves a detailed methodology using available industry data. The alternative approach, where data may not be available, is prioritising landfill diversion. The assessment has assessed, based on landfill void capacity if data is available, where this is not available the diversion approach has been considered. The impact magnitude ratings are outlined in Table 19.4.

Table 19.4: Criteria for determining magnitude of impact for waste (IEMA, 2020).

Magnitude	Criteria
Method 1	
Major	Reduce landfill void capacity by >10%
Moderate	Reduce landfill void capacity by 6-10%
Minor	Reduce landfill void capacity by 1-5%
Negligible	Reduce landfill void capacity by <1%
No change	Zero waste generation
Method 2	
Major	<30% landfill diversion
Moderate	30-59% landfill diversion
Minor	60-89% landfill diversion
Negligible	90-99% landfill diversion
No change	100% landfill diversion

19.25 The criteria for determining the magnitude of impact is outlined in Table 19.5. This comprises a percentage-based approach, measuring the volume of materials by percentage against regional or national baseline availability.

Table 19.5: Criteria for determining magnitude of impact for materials (IEMA, 2020).

Magnitude	Criteria
Major	No material type is equal or greater than 10% by volume of the regional or national baseline availability
Moderate	No material type is equal or greater than by 6-10% by volume of the regional or national baseline availability
Minor	No material type is equal or greater than between 1-5% by volume of the regional or national baseline availability
Negligible	No material type is equal or greater than 1% by volume of the regional or national baseline availability
No change	No materials are required

Assessment significance criteria

19.26 Both the qualitative and quantitative assessments are used to finally determine the significance of waste and materials effects. These are described as:

- Beneficial or adverse;

- permanent or reversible;
- short, medium or long term;
- significant (moderate or very large) or insignificant (neutral or minor).

19.27 To define the significance of effect of the Proposed Development, an assessment of impacts is to be carried out. This involves assessing the magnitude of change against receptor sensitivity. The matrix to determine the significance of effects is outlined in Table 19.6. Moderate, large and very large effects are considered to be significant.

Table 19.6: Matrix for determining effect significance.

Receptor Sensitivity	Magnitude of impact					
		No change	Negligible	Minor	Moderate	Major
	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

19.28 Cumulative effects with other committed developments that may have a cumulative effect on waste and material receptors have been considered, where quantitative information is not available a qualitative assessment has been undertaken. Interactive effects with other EIA chapters such as transport, air quality and water quality have been assessed.

Uncertainties

19.29 There are uncertainties around demolition of the existing buildings on site of the Proposed Development, particularly regarding unknown contents of the internal portion of the buildings.

19.30 In the assessment of the baseline conditions, information on construction waste generated within the local areas is limited or not available. In addition, regional and national baseline information on materials is limited, and for the design material quantities and sources.

RELEVANT LAW, POLICY AND GUIDANCE

19.31 The following legislation, policy and best practice guidance are relevant to the Proposed

Development in relation to solid waste and material management:

National Policy Statements

19.32 National Policy Statements set out the need for and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Due to the scale of transport and highway infrastructure in the Proposed Development, there will be significant demand for construction materials. This gives potential for a rise in construction waste. The relevant policies in the NPS for National Networks which may be relevant include:

- Environmental and social impacts (NPS paragraphs 3.2 - 3.5);
- Criteria for “good design” for national network infrastructure (NPS paragraphs 4.28 – 4.35);
- Pollution control and other environmental protection regimes (NPS paragraphs 4.48 – 4.56);
- Waste management (NPS paragraphs 5.39 – 5.45); and
- Dust, odour, artificial light, smoke, steam (NPS paragraphs 5.81 – 5.89).

Other national guidance

19.33 The following national guidance documents have been considered in the assessment:

National Planning Policy Framework 2019, Ministry of Housing, Communities and Local Government, 2019

19.34 The National Planning Policy Framework (NPPF) notes that the purpose of the planning system is to contribute to the achievement of sustainable development. The document identifies three dimensions to sustainable development, with an environmental dimension being one of them. As part of the environmental role, the document notes that efforts must be made to minimise waste generation and increase re-use and recycling. In the framework it is stated that during the planning stages of development, recycled or secondary materials should be prioritised over use of primary material.

National Planning Policy for Waste, Department for Environment, Food and Rural Affairs, 2014

19.35 This document sets out detailed waste planning policies and guidance to waste planning authorities in preparing their Local Plans. Of key importance is the requirement for waste planning authorities to identify sufficient opportunities to meet identified needs of their area for the management of waste streams. Particularly, waste planning authorities should work collaboratively in groups with other waste planning authorities and in two-tier areas with district authorities, through the statutory duty to cooperate, to provide a suitable network of facilities to deliver sustainable waste management.

Our waste, our resources: A strategy for England Department for Environment, Food and Rural Affairs, 2018

19.36 This document sets out guidance in line with the UK Government's 25 Year Environmental Plan on how material resources will be preserved by minimising waste, promoting resource efficiency and moving towards a circular economy in England. The strategy includes aims to improve recycling rates, have separate food waste collections, and subsequently reduce landfill waste. These require the appropriate planning in new developments to allow for effective separation of materials. A number of milestones that are relevant to municipal disposal, following on from the 2013 Waste Management Plan for England (DEFRA, 2013) include:

- Overall packaging waste recycling to reach 70% by 2030; and
- Municipal waste to landfill to be 10% or less by 2035.

Government Review of Waste Policy, Department for Environment, Food and Rural Affairs, 2011

19.37 This document contains actions and commitments towards a zero-waste economy. It contains a review of waste policies in England and outlines the findings. The main relevant sections to this assessment include; sustainable use of materials, waste prevention, infrastructure and planning and the general principles of the waste hierarchy and other environmental principles.

Waste Management Plan for England, Department for Environment, Food and Rural Affairs, 2013

19.38 This document sets out a planning framework to help local authorities develop strategies that identify sites and areas suitable for new or enhanced waste management infrastructure/facilities. In addition, the document provides advice for local authorities to better apply the waste hierarchy in their own jurisdiction.

19.39 The waste hierarchy ranks waste management options according to what is best for the environment. This goes in the order of 'prevention, reuse, recycling, recovery and disposal', with disposal being the least preferred option.

- 19.40 At its core, the Plan describes how the government intends to work towards a more efficient and sustainable approach to waste and resource use/management. It provides an analysis of the waste management situation in England and how it will aim to achieve the objectives and provisions of the EU Waste Framework Directive (EC, 2008). An important point to note is the uncertainty around Brexit and current EU legislation. It has not been confirmed yet whether EU waste targets will be transferred into British law.
- 19.41 A number of key targets from the 2011 Waste Regulations (UK Government, 2011) are reiterated in the plan, including at least 70% by weight of construction and demolition waste is subject to material recovery by 2020.

WRAP Designing out Waste: a design team guide for civil engineering

- 19.42 This document provides design guidance for waste and resource efficiency, focused towards construction waste. The guide outlines drivers for reducing construction waste to landfill and the environmental impacts. The main relevant sections for reference in this assessment include; principles of designing out waste, application of these principles and the process of designing out waste.

Institute of Environmental Management and Assessment (IEMA) guide to Materials and Waste in Environmental Impact Assessments, 2020

- 19.43 This document provides initial guidance on key terms, concepts and considerations for assessing environmental impacts and effects of materials and waste in the EIA process. There are four main areas of focus for the document, including; principles that govern the assessment process, impacts and effects associated with materials and waste, what an assessment of materials and waste should entail and key messages for industry to advance best practice. This assessment uses this guidance for the methodology, including measuring environmental effects through sensitivity, magnitude and cumulative effects.

Local policy and guidance

- 19.44 This section includes local policies relevant to the Proposed Development in relation to solid waste and material management. Guidance from Kent and Essex councils have been included for the assessment. The main waste generation source from the Proposed Development will be from the Kent Project Site, however some waste will also be produced from the Essex Project Site. In addition, waste may be transported through or treated in either Kent, Thurrock or Essex as the strategy aims to transport waste and materials on the River Thames.

Kent Minerals and Waste Local Plan 2013 – 2030

- 19.45 This document sets out a framework and planning policies for new development regarding mineral extraction, importation and waste recycling. It includes targets and objectives for waste and mineral management. Points of relevance to this assessment include the objective of achieving local net self-sufficiency of waste management and providing

opportunities for additional waste management capacity. In terms of minerals and materials, relevant objectives include:

- Ensure delivery of adequate and steady supplies of sand, gravel, chalk, brick, earth, clay, silica sand, crushed rock etc. through identifying sufficient sites and safeguarding mineral bearing land;
- Promote the use of recycled and secondary aggregates in place of land-won minerals;
- Safeguard existing, planned and potential sites for mineral infrastructure; and
- Encourage the sustainable use of the inert non-recyclable fraction of CD&E waste for quarry restoration.

Kent Waste Disposal Strategy 2017 – 2035, Kent County Council

19.46 The strategy sets out Kent’s current position, future pressures and how to maintain a sustainable waste management service in Kent. A number of priorities are included, in line with national strategies and the waste hierarchy for environmental protection. Relevant priorities considered in this assessment include:

- Deliver services which mitigate impacts on or from environment and climate change; and
- Provide accessible service whilst encouraging customers to reuse and recycle, and let people know what happens to their waste.

Essex and Southend on Sea Waste Local Plan (ECC/ SOSBC, 2017)

19.47 This plan covers all types of waste produced in the Essex and Southend area, and how they are to be managed to reduce negative impact on the environment. The plan forms part of the statutory development plan and provides policies for waste planning. It sets out a plan for future waste needs of the area up until 2032. Main relevant sections include existing waste management capacity, future needs and considerations for waste management proposals.

Essex Minerals and Waste Authority Monitoring Report (ECC, 2018)

19.48 This document assesses current waste arisings and mineral demand, as well as future development trends affecting the area of Essex. Current levels are compared to local and national policy targets. The report also contains lists of operational waste and mineral sites in the area.

Local Development Framework: Core Strategy and Policies for Management of Development, Thurrock Council, 2015

19.49 This strategy document is a foundation for new development sites to follow for detailed policies on many aspects. In relation to the Proposed Development and this assessment, relevant topics include strategic environment policies and mineral and waste policies. The strategy includes important figures for this assessment on waste arisings, current and future waste management options and capacities.

Thurrock Local Plan: Sustainability Appraisal Scoping Report, Thurrock Council, 2016

19.50 This document sets out a scope of the sustainability appraisal of Thurrock's Local Plan. It includes relevant sections on strategic environmental assessment, local and national policy context and specific sections on materials and waste. It details the current baseline including landfill sites, waste generation and projected baseline up until 2027.

BASELINE CONDITIONS

Materials baseline

19.51 Due to limited available data on current local and regional material availability, this baseline assessment focuses on national production and imports of materials. The material selected to be assessed are steel and concrete, as these are likely to make up a large portion of the total materials used in the Proposed Development. The other main materials used in the Proposed Development will be assessed as part of the ES when more detail becomes available on the types of materials to be used during the construction phase.

Steel

19.52 As of 2018, the United Kingdom produced 7.3 million metric tons of crude steel (Statista, 2018). Imports of steel in 2018 were slightly higher than steel produced in the UK. Around 7.8 Mt of steel products were imported in 2018 (ISSB, 2020). The demand for steel in the UK in 2018 was 10.72 million tonnes (ISSB, 2020).

19.53 Over the last 10 years, crude steel production has fluctuated. From 2015 onwards, British crude steel production has been constantly declining. In the last years, import activity has steadily increased while exports decline rapidly. However, future trends hold large uncertainties and are characterised by constant changes as demand and production are widely dependent on global markets (Statista, 2018).

Concrete

19.54 National demand of concrete in the UK totalled approximately 81.9 million tonnes in 2016 (MPA, 2018). In 2018, the total amount of concrete blocks produced in Great Britain was

26,025 thousand square metres, of which approximately 80% was produced in England (Statista, 2018).

- 19.55 The import of cement into Great Britain in 2018 was at 2.6 Mt, which were imported by manufacturers and other entities. The amount of cement imported by manufacturers and other entities have shown considerable increases in the last years (Statista, 2018).
- 19.56 Future trends for the imports and production of cement and products of concrete hold considerable uncertainties as the construction sector is largely depending on international developments and political landscapes. Especially, the heightened uncertainty around Brexit is causing some domestic and overseas investors to pause the construction of projects and will continue to contribute to broader constraints on supply (UK Government, National Statistics, 2019).

Waste baseline

- 19.57 This section describes the baseline scenario for waste management in areas relevant to the Proposed Development. The main location (the Kent Project Site) of the Proposed Development is in Kent, within the boroughs of both Dartford and Gravesham, with the second location (including car park and transport links) in Thurrock (the Essex Project Site). It is however likely that waste generated will be managed and treated in the wider area including Essex. For the purpose of the assessment, to cover all scenarios, Kent and Essex have been included in the baseline conditions.

Kent

- 19.58 The *Kent Minerals and Waste Local Plan 2013-30* seeks self-sufficiency in managing non-hazardous waste arising in Kent, and to provide limited capacity for non-hazardous waste from London. As of 2016, the local plan states that Kent is achieving self-sufficiency in managing its all waste streams (KCC, 2016).
- 19.59 There are 12 district and borough councils in Kent, all of which provide collection services to households across Kent. However, council Commercial and Industrial (C&I) collections are limited to the areas of Gravesham, Maidstone and Sevenoaks. For the remainder of C&I waste, this is collected by private contractors. The Proposed Development is located within both Gravesham and Dartford districts.
- 19.60 Waste generation estimations for Kent for the year 2018 have been used to inform this assessment and were primarily obtained from data published by the UK Government Environment Agency.
- 19.61 In 2018, according to data from the UK Environment Agency, the 45 facilities in Kent recorded for treating Municipal Solid Waste (MSW) and CD&E waste had a total annual input of 1,498,431 tonnes. This is including waste imported from surrounding areas. The total annual capacity of these facilities was recorded at 6,694,786 tonnes, leaving a capacity gap of 5,196,355 tonnes in 2018.

19.62 The 2013-30 Kent Minerals and Waste Local Plan provides estimates of C&I waste, which amounted to 1,701,800 tonnes (assumed to be for 2016). This data may not be accurate as is not specifically dated on the plan document but is assumed to be relevant to 2016 when the document was adopted.

19.63 No information was found in regard to the available C&I capacity for Kent. As part of the public consultation process and the further assessment as part of the ES, this information will be included if it becomes available.

The Kent Waste Needs Assessment 2017 (BPP, 2017) provides estimates of C, D & E waste arisings, which totalled 2,249,123 in 2015. A breakdown of how this waste was managed is summarised in Table 19.7.

Table 19.7: Management of Kent CD&E waste in 2015 through permitted sites excluding hazardous waste (BPP, 2017).

	Landfill	Recovery to land	Transfer	Treatment	Metal recycling	Total
Arisings managed within Kent (tonnes)	720,640	317,948	237,415	480,973	95,626	1,852,602
Arisings managed out with Kent (tonnes)	110,133	33,433	64,411	81,352	107,191	396,521
Total	830,773	351,381	301,826	562,326	202,817	2,249,123

19.64 Information with regard to the available C, D & E capacity for Kent is not available. As part of the public consultation process and the further assessment, as part of the ES, further information will be included should it become available.

19.65 Kent has several active waste management contracts for handling and treatment of MSW. MSW includes wastes from private households, and in some districts, C&I waste is included. The relevant and up to date contracts include (KCC, 2012):

- A 25-year contract for final disposal through Waste to Energy and Materials Recovery Facilities with Kent Enviropower Ltd up until March 2038;
- Green and food waste composting until July 2022 with New Earth Solutions Ltd;
- Wood waste recycling at Countrystyle Composting Ltd until November 2021;
- Waste transfer up until October 2022 at Dover and Hawkinge Transfer stations with Viridor Waste Kent Ltd;

- Waste transfer up until January 2033 at Pepperhill Transfer Station with Waste Recycling Group Ltd; and
- An East Kent Joint Waste Contract for collection, transfer and processing up until January 2021 with Veolia.

19.66 The maximum tonnage capacities for these sites are summarised in Table 19.8:

Table 19.8: Kent operational waste facility capacities (KCC, 2012).

Site	Tonnage capacity per annum	Contract Expiry
Final Disposal WtE & MRF – Allington (Kent Enviropower)	374,000	2038
Blaise Farm (New Earth Solutions Ltd)	30,000	2022
Countrystyle Composting Ltd	35,000	2021
Dover/Hawkinge Transfer (Viridor)	100,000	2022
Pepperhill Transfer Station (Waste Recycling Group)	n/a	2033

19.67 As of 2018, according to UK Government data from England, there are 46 solid waste management facilities across the 12 district councils in Kent. These facilities treat both MSW and CD&E related waste. The total input recorded in 2018 to these facilities was 1,514,220 tonnes, with a total available capacity of 6,694,786 tonnes. This results in a spare capacity of 5,196,355 tonnes.

19.68 This data shows there is considerable spare capacity for waste treatment in the area of Kent. It should be noted however that a significant amount of waste generated in Kent is treated outside of the authority area, and Kent accepts a portion of waste from London areas.

Thurrock

19.69 Thurrock Council provides residential collections as well as a trade waste service for C&I waste. Private contractors collect the remainder of commercial waste in the unitary authority area.

19.70 Waste generation estimations for Thurrock for the year 2018 and 2014/15 have been used to inform this assessment and were primarily obtained from data published by the Environment Agency and the Thurrock Local Plan (Sustainability Appraisal Scoping Report) 2016 and Core Strategy. Older 2014/15 data has been used to supplement more recent 2018 data due to breakdowns of certain types of waste only being available for 2014/15.

- 19.71 Thurrock Council collected a total of 3,131 tonnes of non-household MSW in 2014/15. This figure only represents a small portion of total C&I waste collected in the area. In 2014/15, of the total collected MSW 39.8% was recycled or composted, 37.5% was incinerated and 17.9% was landfilled.
- 19.72 In 2018, according to data from the Environment Agency, the 14 facilities in Thurrock recorded for treating MSW and CD&E waste had a total annual input of 1,108,189 tonnes. This includes waste imported from surrounding areas. The total annual capacity of these facilities is 2,224,992 tonnes leaving a space capacity of 1,116,803 tonnes for 2018.
- 19.73 Based on available data it is difficult to establish recent arising breakdowns of C&I and CD&E waste alone due to a lack of robust data sources for specific waste streams.

Essex

- 19.74 In 2018, according to data from the Environment Agency, the 49 facilities in Essex recorded for treating MSW and CD&E waste had a total annual input of 1,227,964 tonnes. This is including waste imported from surrounding areas. The total annual capacity of these facilities was recorded at 4,645,469 tonnes, leaving a capacity gap of 3,417,505 tonnes for 2018.
- 19.75 A breakdown of capacity facility types, as of 2015, are outlined in the *Essex and Southend on Sea Waste Local Plan (ECC & SOSBC, 2017)*. The breakdown and total capacity for these areas is summarised in Table 19.9.

Table 19.9: Essex and Southend on Sea existing waste management capacity in 2015 (ECC & SOSBC, 2017).

Facility types	Capacity (tonnes)
Transfer	1,776,928
Non-inert materials recovery	2,262,963
Biological treatment	280,938
Inert materials recovery	2,072,073
Energy recovery	21,792
Disposal landfill	17,964
Total	22,602,560

- 19.76 Non-local authority waste makes up approximately 80% of all waste managed in the Essex and Southend on Sea area (ECC & SOSBC, 2017). C&I waste arising from the Essex and Southend on Sea is specified in the *Essex and Southend on Sea Waste Needs Assessment Update: Updated Baseline for Commercial & Industrial Waste (2018)*. The annual C&I

arising from 2016 in the area totalled 1.26 million tonnes. A breakdown of how this waste was treated is summarised in Table 19.10.

Table 19.10: Management of C&I waste in Essex and Southend on Sea Area (2016).

	Landfill	Metal recycling	Transfer	Treatment	Recovery to land	Total
Arisings managed within Essex and Southend on Sea	169,964	20,216	52,399	164,133	0	406,712
Arisings managed out with Essex and Southend on Sea	76,683	99,103	292,665	385,471	2,351	856,273
Total (tonnes)	246,647	119,319	345,064	549,604	2,351	1,262,985

19.77 The Minerals and Waste Authority Monitoring Report (ECC, 2018) provides the quantities of waste arising within the area of Essex for C&I waste. The total arisings and consented capacity available for C&I waste is summarised in Table 19.11.

Table 19.11: C&I waste produced in 2017 in Essex vs consented capacity (ECC, 2018).

	Waste (tonnes)
Total C&I waste	1,060,000
Total consented management capacity in area (Local authority collected waste + C&I waste)	2,950,000*
Spare capacity (tonnes)	1,890,000

*based on an assumed density of 500kg/m³ (original value 5.9Mm³)

19.78 The WDI⁵ report, referenced in the *Essex County Council Authority Monitoring Report 2017/18 (2019)*, states that in 2017, total non-hazardous CD&E waste from Essex and Southend on Sea managed through permitted sites totalled 3.1 million tonnes. A breakdown of routes is summarised in Table 19.12.

Table 19.12: Management of CD&E waste from Essex and Southend on Sea through permitted sites (tonnes) WDI, 2017.

	Permanent deposit to land			Transfer	Treatment	Metal recycling	Total
	Non inert landfill	Inert landfill	Recovery to land				
Waste managed in plan area (tonnes)	614,314	383,457	251,544	396,596	608,786	83,037	2,337,734
Waste transported out of plan area for management (tonnes)	71,378	116,042	78,038	126,162	327,404	51,603	770,626
Total (tonnes)	685,691	499,499	329,582	522,758	936,190	134,640	3,108,360

19.79 The Minerals and Waste Authority Monitoring Report (ECC, 2018) provides the quantities of waste arising within the area of Essex for CD&E waste. The total arisings and consented capacity available for CD&E waste is summarised in Table 19.13.

Table 19.13: CD&E waste produced in 2017 in Essex vs consented capacity (ECC, 2018).

	Waste (tonnes)
Total CD&E waste	1,775,000
Total consented management capacity in area for CD&E waste	2,400,000
Spare capacity (tonnes)	625,000

**based on assumed density of 500kg/m³ (original value 4.8Mm³)*

19.80 It is noted that the available data does not allow a consistent perspective on the same years of C&I and CD&E waste alone due to the lack consistent information for each waste stream.

Summary of current baseline for areas of Kent and Essex

19.81 To determine capacity gaps in waste infrastructure in the wider areas of Kent and Essex, recent waste arisings and available capacities have been sought where available for C&I and CD&E waste. A summary of the arisings and capacity gaps are shown in Table 19.14.

Table 19.14: Arisings, capacities and capacity gaps for Kent and Essex.

	Kent (2015/16) (tonnes)	Essex (2017) (tonnes)
Current arisings C&I (tonnes)	1,701,800	1,060,000
Current capacity C&I (tonnes)	n/a	2,950,000
Capacity gap C&I (tonnes)	n/a	1,890,000
Current arisings CD&E (tonnes)	2,249,123	1,775,000
Current capacity CD&E (tonnes)	n/a	2,400,000
Capacity gap CD&E (tonnes)	n/a	625,000

19.82 Spare landfill capacities, as of the end of 2018, are summarised in Table 19.15 for Kent and Essex. These capacities include landfill capacities for both construction and operational waste types.

Table 19.15: Spare landfill capacities of Kent and Essex (DEFRA, 2018).

	Kent	Essex
Number of landfill facilities	23	21
Remaining landfill capacity at end of 2018 (m ³)	8,666,236	15,043,103
Total remaining landfill capacity (2018) of combined areas of Kent and Essex (m ³)	23,709,339	

Future Baseline

19.83 The future baseline when the Proposed Development is assumed to be completed will be between the range of 2024 and 2029 (Gate 2). Projections of waste arisings and capacity are currently available up until 2027 for Thurrock, 2031 for Kent and 2035 for Essex.

Kent (2030/1)

19.84 Data on projected waste generation in Kent is provided in the *Kent Minerals and Waste Local Plan (KMWLP, 2016) 2013-30* and additional data on forecasting is included in the

Kent Minerals and Waste Development Framework (2012) (KMWDF).

19.85 The data available for specific C&I waste growth is available from 2010 up until 2030 from the *KMWLP*. This is summarised in Table 19.16. The table shows a worst-case scenario/higher growth range. The lower growth range is 0% up to 2030, based on successful reduction of waste. Tonnages have also been included, with the low growth range remaining at 1,139,000 tonnes of C&I generation up until 2030.

Table 19.16: Kent C&I future waste generation (higher growth range).

	2010	2015	2020	2025	2030
C&I waste high growth forecast %	2.5%	2%	1.5%	1%	1%
C&I waste growth forecast high growth (tonnes)	1,261,000	1,392,000	1,500,000	1,576,000	1,657,000
C&I waste growth forecast low growth 0% (tonnes)	1,139,000	1,139,000	1,139,000	1,139,000	1,139,000

19.86 Forecasts, in the form of targets from the South East Plan are also available on future management of C&I waste, split into treatment methods. These different routes are summarised in Table 19.17.

Table 19.17: South East Plan C&I waste management routes.

Waste Facility	2010	2015	2020	2025	2030
Recycling/composting	50%	50%	60%	65%	65%
Other recovery (excl. recycling/composting)	15%	20%	21%	19%	19%
Landfill	35%	30%	19%	16%	16%

19.87 To meet the targets of the South East Plan for C&I waste, the forecasts conclude that between 32,000 tonnes (low forecast) and 311,000 tonnes (high forecast) of additional recycling capacity is needed in Kent by 2026.

19.88 According to the KMWDF, additional capacity is expected to be required for MSW and C&I for the composting stream only from 2024. For other MSW streams, additional capacity is not considered to be necessary.

19.89 The Kent Waste Needs Assessment 2017 specifies CD&E needs for Kent. These are summarised in Table 19.18.

Table 19.18: Kent management requirements for CD&E waste 2026-2031 (BPP, 2017).

Waste Facility	Annual tonnage 2026-2031
Recycling/composting	1,560,000
Other recovery (excl. recycling/composting)	780,000
Landfill	260,000

Thurrock (2027)

19.90 Projected waste generation in Thurrock is provided in the *2010 Waste Management Needs Assessment* to the year 2027 for MSW, C&I and CD&E waste. MSW is not considered relevant to this assessment as the majority of this is household waste. A summary of C&I waste arisings for relevant years to the proposed development are summarised in Table 19.19.

Table 19.19: Thurrock future waste generation.

Year	C&I waste (tonnes)
2024/25	186,357
2025/26	189,551
2026/27	192,745

19.91 Forecasts for C&D waste for an upper and lower growth scenario are also included in the *Waste Needs Assessment 2010* for year up until 2027. These are summarised in Table 19.20.

Table 19.20: Thurrock future waste generation C&D upper and lower scenarios.

Year	C&D waste (tonnes) Upper growth scenario	C&D waste (tonnes) Lower growth scenario
2024/25	451,650	374,467
2025/26	458,612	376,764
2026/27	465,560	379,100

19.92 According to the *Thurrock Local Plan (2016)*, Thurrock has considerable landfill capacity to meet its needs. Without imports from London, it is predicted that there would be capacity in Thurrock to take all the waste required until beyond 2027. However, the *2010 Waste Management Needs Assessment* explains that, including imports from London, there is only a small capacity available for non-specialist waste.

19.93 For upper and lower bounds of arising recycling and composting capacity, there is insufficient capacity forecast to manage MSW and C&I waste arisings for the study period of up to 2027.

Essex (2035)

19.94 Data on C&I waste forecasts for Essex and Southend on Sea is available from the 2015 Waste Capacity Gap Update from BPP Consulting. The forecast up until 2035 is summarised in Table 19.21.

Table 19.21: Forecast C&I arisings to 2035 (000s) tonnes for Essex and Southend on Sea.

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
C&I Waste	1,255	1,257	1,260	1,262	1,264	1,268	1,271	1,274	1,277	1,279	1,282	1,285

19.95 Forecasts for CD&E waste arisings, summarised in Table 19.22, are available from 2024 up until the year 2035 with a 0.3% growth increase scenario. With 0% growth since 2014 records, CD&E waste capacity requirements would remain at 3,310,823 tonnes.

Table 19.22: Forecast CD&E waste arisings with 0.3% growth scenario to 2035 (000s) tonnes for Essex and Southend on Sea (BPP, 2015).

Year	CD&E waste + 0.3% growth	Year	CD&E waste + 0.3% growth
2024	3,411,500	2030	3,473,369
2025	3,421,734	2031	3,483,789
2026	3,431,999	2032	3,494,240
2027	3,442,295	2033	3,504,723
2028	3,452,622	2034	3,515,237
2029	3,462,980	2035	3,525,783

19.96 CD&E forecasts show a shortfall between the plan area projected arisings and current available capacity in the *Waste Capacity Gap Update* report. The shortfall, in a worst-case scenario, ranges from 1.03 million tonnes in 2025 to 1.6 million in 2035.

Identified receptors and their sensitivities

19.97 Table 19.23 and Table 19.24 provides a summary of the identified receptors and current assumed sensitivity for waste and materials respectively, based on the information outlined in the baseline section. The waste and materials sensitivity may change within the ES as further baseline information is available.

Table 19.23: Identified waste receptors and their assumed sensitivity.

Receptor	Sensitivity	Justification
Construction		
Inert / non-hazardous landfill void (regionally)	Medium	There is a shortfall in CD&E waste capacity within Essex.
Operation		
Inert / non-hazardous landfill void (regionally)	Low	Additional capacity is required for composting and recycling streams only, but not for other waste streams as outlined in local authority plans.

Table 19.24: Identified material receptors and their assumed sensitivity.

Receptor	Sensitivity	Justification
Construction		
Steel	Medium	British crude steel production has been declining and imports increasing. However, future trends hold large uncertainties and are characterised by constant changes as demand and production are widely dependent on global markets.
Concrete	Low	The UK was a net importer of cement in 2018, which were imported by manufacturers and other entities and have increased over recent years.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSAL

Demolition and construction effects

Waste

19.98 C&D comprises of waste arising from the construction and demolition industries and is made up of mainly inert materials such as soils, stone, concrete, brick and tile. There are also non-inert elements in this waste stream, such as wood, metals, plastics, cardboard, and residual household-like waste. Due to their weight, the inert material typically makes up the majority of total C&D tonnage.

19.99 The development will generate significant volumes of C&D waste during the construction period. Potential volumes of C&D waste generated will be estimated as part of the ES. The estimation will be based on industry standards, based on the development of new proposed gross floor areas. Demolition waste will be estimated, based on footprint and type of buildings that are proposed to be demolished. Excavation waste will be estimated following the cut and fill design of the Proposed Development and will be provided in the ES.

The likely significance of effects from construction and demolition waste would potentially be moderate adverse prior to mitigation based on the expected waste generation. This will be a temporary effect based on the duration of the construction period. The likely effects of excavation material are expected to be more significant than construction and demolition waste. As historic information states that some of the area includes pollution from industrial materials. As part of the ES excavation, demolition and construction waste quantities and composition estimates will be made and used to assess the effects during the construction phase. The latest estimated construction and demolition generation is summarised in Table 19.25, subject to change.

Table 19.25: Estimated CD&E waste quantities.

Waste type	Total estimated waste (tonnes)
Construction	110,500
Demolition	14,100
Excavation	TBC
Total	124,600

Materials

19.100 During construction there will be a demand for raw materials, though recycled materials should be sourced where practical. As steel and concrete are both produced nationally and imported, the likely significance of effects on materials is predicted to be slight adverse.

Operational Effects

Waste

19.101 The challenges associated with managing waste in multi-use environments are well documented. There is a clear need to ensure that waste is removed from the Proposed Development (predominantly from back of house areas) without creating congestion or hygiene concerns. Upstream waste management, focusing on the reduction of waste generated on site, must also be considered at an early stage of the project. A draft OWMP will be provided as part of the ES. This will set out estimated operational waste generation, composition and how operational waste will be managed.

19.102 In order to determine the likely servicing requirements for waste management within the Proposed Development, it is necessary to understand the forecast volume of waste which may be generated. Kent County Council (KCC) and Thurrock Council currently do not produce guidelines to estimate waste generation from developments.

19.103 Table 19.26 shows the estimated total operational waste generation of the Proposed

Development. As part of the development of the OWMP the estimated waste generation will be further refined and broken down into different waste streams for collection and management and outlined in the ES.

Table 19.26: Estimated operational waste quantities.

Land Use	Total estimated waste (tonnes per annum)
Zone A (Theme Park)	15,300
Zone B (Hotels, Market, Commercial)	5,400
Zone C (Support facilities, staff residential)	1,100
Total	21,800

19.104 Prior to mitigation measures the significance of effect will likely be slight to moderate adverse, as the Proposed Development is estimated to produce 21,800 tonnes per year.

PROPOSED MITIGATION

Construction

19.105 A SWMP will be prepared as part of the ES. Some of the features that the SWMP will specify that will help further mitigate the adverse effects caused by C&D waste arisings include:

- The SWMP will ensure that C&D waste produced from the Proposed Development is handled in an environmentally sustainable manner and in line with industry best practice and relevant policies;
- The SWMP will outline measures to design out waste that may be adopted at later design stages in order to reduce C&D waste generation or maximise reused or recycled waste considering the WRAP designing out waste principles; and
- The SWMP will contain recommendations and best practice for the management of C&D waste on-site during the construction phase which would help increase recovery and recycling rates (thus minimising landfilling)

General construction waste management

19.106 During construction, the Principal Contractor will be responsible for waste management. All contractors will take reasonable steps to ensure that all waste from the site is dealt with in accordance with the Environmental Protection (Duty of Care) Regulations. In line with this, all site materials will be handled efficiently to minimise wastage and all waste arisings from the site will be managed appropriately.

19.107 Upon operation of the Proposed Development, the site operator will ensure registered

waste carriers are used to convey any waste material off-site to a suitably permitted facility and described on waste transfer notes or hazardous waste consignment note to track the movement of waste.

19.108 Sustainable waste management techniques will be considered throughout the site preparation, demolition and construction phases. A nominated waste champion will oversee the implementation plan and will ensure the project adopts the following sustainable waste management principles.

Materials management on-site

- A system will be established so that the correct quantities of materials are ordered. This will reduce the volume of unused materials going to landfill;
- Dedicated areas will be created that allow for the correct storage of new building materials. This will reduce the risk of contamination/spoiling;
- Timely ordering of materials will reduce the time that materials are stored on site. This will also reduce the risk of spoiling;
- Provision of clearly marked segregated bins/skips for construction materials to avoid cross-contamination and to facilitate recycling;
- Recycled materials should be sourced where possible to reduce the demand for virgin materials;
- All waste generated will be stored in designated areas that are isolated from surface drainage. Waste containers will be covered to prevent dust and litter being blown out and rainwater accumulating. Containers will be inspected regularly and replaced when full.

Waste segregation on-site

19.109 Waste will be segregated on-site wherever possible. The following recommendations should be considered to minimise the amount of waste produced and increase the proportion of waste that is segregated:

- A specific area should be allocated and labelled to facilitate the segregation of waste materials for potential re-use, recycling and recovery;
- Hazardous waste will be stored separately from non-hazardous waste to avoid contamination in line with the Hazardous Waste Regulations;
- Efforts should be made to recover and recycle packaging waste in accordance with packaging legislation;

- Different waste streams should be segregated. At a minimum, containers/skips for hazardous/non-hazardous waste and plasterboard waste should be provided on-site;
- Recycling and waste skips will be kept clean and clearly marked to reduce contamination of materials. The labelling shall use 'Waste Stream Colour Codes';
- Training will be provided for all site personnel, informing them of the correct disposal routes for materials. A site waste champion will be appointed to oversee correct segregation/disposal and keep a record of all resources generated on-site.

Operational

19.110 Ensuring that adequate provision is made for clean, hygienic and efficient waste management is essential to the successful operation and aesthetics of the Proposed Development. An OWMP will be produced to support the design and will be provided as part of the ES. The OWMP will adopt the waste hierarchy principles to divert waste from landfill and maximise recycling. Further the draft OWMP will also include principles of a circular economy to mitigate effects from operational waste management.

19.111 Waste receptacles will be provided within the public realm, office and other areas to segregated waste into several waste streams. All waste is proposed to be collected in five waste streams at source. The streams are: paper and cardboard, mixed packaging, glass, organic waste and residual waste.

19.112 The owners and operators in the Proposed Development will have a duty of care to ensure that waste is handled safely and appropriately in line with the regulations, in addition the operator will also have to adhere to the producer responsibility and WEEE regulations.

SUMMARY OF RESIDUAL EFFECTS

19.113 This chapter sets out the initial assessment of the residual effects that remain once mitigation measures have been applied.

Table 19.27: Summary of likely residual effects during demolition and construction.

Receptor	Effect	Significance before mitigation	Supplementary mitigation	Residual effect significance
Inert / non-hazardous landfill void (regionally)	Pressure on regional waste management infrastructure to collect and manage CD&E waste arisings from the	Moderate	A SWMP will be developed as part of the ES to be implemented during construction to	Slight – neutral

Receptor	Effect	Significance before mitigation	Supplementary mitigation	Residual effect significance
	construction of the Proposed Development throughout the construction phase		increase recycling and reduce waste. In addition, as part of the design, measures to design out waste will be considered.	
Consumption of materials	Depleting of natural resources that will result in either temporary or permanent loss within the natural environment	Slight – moderate	During construction materials management should be in place and recycled materials sourced where possible.	Slight

Table 19.28: Summary of residual effects during operation.

Receptor	Effect	Significance before mitigation	Supplementary mitigation	Residual effect significance
Inert / non-hazardous landfill void (regionally)	Pressure on regional area to collect, transfer and manage residual waste arisings from the proposed development.	Moderate	An OWMS will be produced and included in the ES, this will outline measures to provide sufficient storage to manage and segregate recyclables.	Slight

CUMULATIVE AND IN-COMBINATION EFFECTS

19.114 Cumulative effects will be assessed in the ES, with waste and materials data accounting for committed developments. Other proposed developments/activities that might have a cumulative or in-combination effect upon waste or materials will be considered following

consultation with relevant stakeholders.

19.115 Cumulative effects are multiple effects on the same receptor, arising from a proposed development in combination with all developments that have been built and are operational. In-combination effects are those that might arise from the development proposed in combination with other plans and projects that are proposed or consented but not yet built and operational (i.e. those developments that are separate from the baseline).

CLIMATE CHANGE

19.116 Waste management can have an impact on climate change and be impacted by climate change. It is not anticipated that there will be any direct impacts to the assessment completed. However, increasingly erratic weather patterns will require that waste infrastructure for the Proposed Development is designed to take this into account and provide resilience to ensure efficient operations. Such design could mean including new overall structural measures that will provide higher resistance against environmental damage (e.g. flooding etc.).

SUMMARY AND CONCLUSIONS

19.117 . The Proposed Development will generate significant quantities of both construction and operational waste and will require materials during the construction phase that will deplete natural resources.

19.118 The significance of effects during construction before mitigation is expected to be slight to moderate adverse for materials and moderate adverse for waste. A SWMP will be included as part of the ES that will outline designing out waste measures as part of the design, and measures that should be adopted during the construction phase to maximise waste segregation and recycling. Reuse and recycled materials procurement should be adopted where possible to minimise demand on virgin materials. Following mitigation, it is expected the residual effects to be slight adverse for materials and waste.

19.119 The significance of effects during the operational phase is expected to be moderately adverse before mitigation, as the operation of the Proposed Development will produce waste from the different land uses and the visitors. A high proportion of operational waste will be recyclable and an OWMP will be included as part of the ES outlining the measures to store, segregate and collect waste to maximise recycling. With the implementation of mitigation measures it is expected that the residual effects will be slight adverse.

19.120 As the design develops, consultation is undertaken as part of the ES and further information available this will be considered as part of the ES to assess the effects of the Proposed Development on materials and waste management.