OXFORDSHIRE
STRATEGIC RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information (Work in Progress) Report (PEIR)

Draft Environmental Statement

Chapter 13: Waste

On behalf of
Oxfordshire Railfreight Limited

Prepared by BWB Consulting Ltd
May 2022

CONTENTS

13.1 INTRODUCTION

13.1.1 This draft Chapter presents the preliminary findings of the assessment of the likely significant environmental effects associated with the management of solid waste arising during the demolition, construction and operation of the Proposed Development. In accordance with guidance from the Institute of Environmental Management and Assessment (IEMA) on the assessment of materials and waste in Environmental Impact Assessment (EIA)[1], the current baseline conditions have been assessed and subsequently considered against the likely significant effects.

13.1.2 Additionally, this draft chapter demonstrates how waste has been considered in terms of the design of the Proposed Development and sets out measures for managing waste during construction and operation to meet legislative and policy requirements.

13.1.3 Being 'preliminary' in nature, it includes an assessment of the potential cumulative effect of the Proposed Development, on the waste environment, alone or in combination with other surrounding significant proposed developments using the information available at the time of writing.

13.1.4 It should therefore be noted that this draft Chapter includes data gaps to be completed at a later date as it is based on information available at the time of writing; the level of detail available varies somewhat, for example, some of the baseline has been informed to date by desk studies and some by in situ assessment, but this approach still allows a preliminary indication of the likely significant effects to inform the consultation. Additional surveys are being undertaken as part of the ongoing preparation of the ES and these will help inform the technical assessments presented in the ES in due course with the Chapter to be updated prior to submission of the SRFI application. Information contained within this draft chapter includes proposed mitigation measures such as a Site Waste Management Plan (SWMP), the primary tool for recording waste movements from the site during the construction process.

13.1.5 The draft Chapter sets out:

- The regulatory framework for managing waste in the UK and also considers national and local policy requirements to provide the context for how the wastes would be managed;
- The key principles for sustainable waste management, i.e. the waste hierarchy principle and the self sufficiency principle;
- A summary of scoping responses related to waste and the existing waste management facilities and the predicted capacity in the future;

[1] IEMA (2020) 'IEMA guide to: Materials and Waste in Environmental Impact Assessment'. Available from: https://www.iema.net/resources/reading-room/2020/03/30/materials-and-waste-in-environmental-impact-assessment

- A description of the baseline waste management measures is provided together with a summary of the proposed measures following completion of the Proposed Development; and
- A preliminary consideration of the waste arisings during the construction phase and the approach for managing wastes in accordance with the waste hierarchy principle. This also includes waste from the demolition/relocation of buildings and structures..

Competency

13.1.6 The information presented here has been drafted by Matt Wilby (Associate Director: Environmental Planning at BWB Consulting Ltd: PIEMA, BSc (Hons)) and reviewed by Ben Withers (Associate Director: Waste Management at Capita Real Estate and Infrastructure: MCIWM, MSc), qualified technical specialists, working to a model structure, described in the methodological section of this chapter.

13.2 ASSESSMENT SCOPE AND METHODOLOGY

13.2.1 This section describes the methodology of the assessment of waste in relation to the Proposed Development. It also alludes to the sources of data which have been utilised, as well as setting out the significance criteria to evaluate potential effects related to waste.

13.2.2 The significant effects identified within this draft chapter are identified on a preliminary basis and are subject to change as the individual assessments progress.

Consultation

Scoping Opinion

13.2.3 An application for an EIA Scoping Opinion was submitted to the Secretary of State in June 2021. A Scoping Opinion from the Planning Inspectorate, on behalf of the Secretary of State, was returned in July 2021.

13.2.4 **Table 13.1** summarises the Planning Inspectorate's comments received in relation to waste, and how these comments have been considered in this draft chapter.

Table 13.1: Scoping Opinion for Waste and Actions Taken

ID	Point	PINS Comments	Actions Taken
4.11.1	Use of materials during construction	The Scoping Report proposes that the likely significant environmental effects from the use of materials (e.g. aggregate, concrete, brick and steel) for the construction of the Development will not be addressed in	The assessor has taken note of this requirement; where possible, assessments of material types and quantities have been taken using best

ID	Point	PINS Comments	Actions Taken
		the ES as there is no fixed design to assess against or end-user to define requirements. Despite the indicative nature of the proposal, the Inspectorate considers that an approximate estimate of materials used in the construction of the development, based on worst case parameters, should be included in the ES and the impacts of this matter should be assessed where significant effects are likely to occur.	practice indicators in relation to the "worst case" based on the parameters plan at the time of writing. Where it has not been feasible to quantify waste arisings, a qualitative assessment has been offered.
4.11.2	Use of excavated materials during construction	The Scoping Report seeks to scope out "*excavated material that can be used, in its natural state, for site engineering and restoration purposes*" from the assessment of likely significant environmental effects of construction. At this stage, the volumes of material to be excavated and then used on-site is not yet known. No information has been provided regarding the storage locations for excavated materials and additional details such as dimensions of any stockpiles and the length of time they would be in situ for. Therefore, the Inspectorate is not in a position to agree to scope these matters from the assessment. Accordingly, the ES should include an assessment of these matters or the information referred to demonstrating agreement with the relevant consultation bodies and the absence of a LSE (likely significant effect).	This chapter, along with Chapter 11 – Ground Conditions, will seek to quantify the amounts of waste generated as a result of the Proposed Developments earthworks.
4.11.3	Types, quantities and removal of on-site waste	It is noted that the types, quantities, and destinations of waste produced as a result of the Proposed Development have not yet been determined. This information should be provided within the ES and the data regarding trip numbers should be included within the Transport Assessment and other relevant chapters such as Air Quality and Noise and Vibration. 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.	Noted: An assessment of the current baseline for waste facilities has been undertaken to determine whether there would be sufficient capacity to receive residual waste during the construction and operational phases.
4.11.4	Mitigation	The ES should contain details of any mitigation measures which may be required for the removal of waste off-site, or the use of materials on site,	Noted: Anticipated mitigation measures at this preliminary stage have been provided to reduce the

ID	Point	PINS Comments	Actions Taken
		i.e. for noise bunds, landscaping etc. Any areas which will be used to stockpile materials on site should be shown on a plan and details be provided as to the dimensions of stockpiles and how long they would be in situ for.	amount of residual waste produced during the construction phase. This includes the re-use of excavated materials for various activities. The proposed mitigation will be reviewed and updated for the final ES.
14.11.5	Severn Trent Green Power 'In Vessel Composting' (IVC) facility	The Proposed Development includes the relocation of Severn Trent Green Power IVC facility. The ES should consider indirect effects on the waste hierarchy should the proposed works significantly impact the operation of this facility.	The chapter as presented reflects ongoing conversations with STGP to date. The final ES chapter will consider effects of this relocation, including a demonstration of stakeholder engagement and licencing / permitting requirements.

Additional Stakeholder Engagement

13.2.5 Statistics related to waste facilities were obtained from the Environment Agency (EA) to provide a basis for consultation with the regulatory stakeholders.

13.2.6 Preliminary conversations with two waste facilities, Severn Trent Green Power IVC facility and Ardley Energy Recovery facility ("Viridor ERF") have been undertaken to inquire about the exact types of waste materials they accept and their capacity to receive waste arising from the Proposed Development, both during the construction and operational phases.

Study Area

13.2.7 The spatial scope of waste assessments is often not easily defined as issues associated with waste management can be far-reaching and extend beyond the application boundary. The Study Area for the assessment of waste will principally comprise the Application Site.

13.2.8 For the construction phase of the Proposed Development, this chapter will provide an assessment of demolition waste of existing on-site structures, as well as construction waste associated with earthworks, the construction of on-site structures and the construction of the Highway Works. Therefore, the assessment expands beyond the boundary of the Application Site.

13.2.9 For the operational phase, an assessment of waste generated by units which would be located within the Main Site only has been undertaken.

13.2.10 In addition, the relevant local waste infrastructure (i.e. waste management facilities up to 30km from the site) and regional mineral resource planning areas, where necessary, will be referred to within the assessment as the 'Study Area'. This area is defined by the availability of landfill sites relative to the proximity of the Application Site. The radius used has to be realistic around the practicalities of construction and operation. If this process identifies a supply problem in relation to landfill capacity, the Proposed Development will look at a wider catchment of landfill capacity. An increase of the Study Area will only be undertaken if the local capacity cannot be met. The use of historical waste data for local waste infrastructure provides an accurate record of the regional requirements when determining the baseline assessment. This assessment takes account of the current available capacity and the quantities received to assess future available capacity. A smaller regional assessment is considered to be a more conservative approach.

Establishing the Baseline

13.2.11 This chapter considers the waste generated during construction and operation of the Proposed Development but excludes wastewater which is covered in Chapter 9: Water Environment (including Flood-Risk, Drainage and Water Quality). The estimates of waste types and quantities are based on information available at the time of writing which includes preliminary construction information and high-level assumptions for occupancy. The waste management measures set out in the chapter are in accordance with legislative obligations, planning policy and best practice guidance.

13.2.12 The potential for excavated land to be contaminated has been assessed in Chapter 11: Ground Conditions and the results of that assessment has been referenced within this Chapter.

13.2.13 The assessment of waste from demolition and construction activities includes all structures on the Application Site. The assessment of effects on roads and junctions has considered Highways England's Design Manual for Roads and Bridges (DMRB) LA 110 Material Assets and Waste guidance[2].

13.2.14 Baseline data that is proportionate to the scale and nature of the Proposed Development was collected. Regional baseline information was targeted as a priority.

13.2.15 Where applicable, production of excavated arisings, and generation and disposal of waste has been described and quantified for the existing activities and operations within the Study Area. A high-level assessment of the mineral resources and aggregates has been made at this stage using the information available at the time for writing. A more comprehensive assessment is proposed in due course, once the

[2] Highways England (2019) 'LA 110 Material Assets and Waste' Available from: https://www.standardsforhighways.co.uk/dmrb/search/6a19a7d4-2596-490d-b17b-4c9e570339e9

cut and fill strategy has become finalised. An assessment of material resources required during the operational phase has been scoped out as it is anticipated that only a minimal quantity would be required.

13.2.16 The assessment of the baseline will be proportionate to the receptors[3] within the Study Area. This is measured by information about these sites within the OCC Minerals and Waste Core Strategy 2017, as well as waste received by each receptor based on EA data.

Identifying the Receptors

13.2.17 Receptors are defined as the physical or biological resource or user group that would be affected by a project. Baseline studies have informed the identification of potential environmental receptors. Some receptors will be more sensitive to certain environmental effects than others. The sensitivity or value of a receptor may depend, for example, on its frequency, extent of occurrence or conservation status at an international, national, regional or local level.

13.2.18 According to IEMA Guidance[1], "For waste, the sensitive receptor is landfill capacity. Landfill is a finite resource, and hence – through the ongoing disposal of waste – there is a continued need to expand existing and develop new facilities. This requires the depletion of natural and other resources which, in turn, adversely impacts the environment".

13.2.19 Receptors have been identified by means of a desk study of Ordnance Survey (OS) map data, publicly available data, the EIA Scoping Report (June 2021), the Proposed Development's designs (including estimates of the cut and fill balance) and the use of waste management experience and judgement.

Sources of Waste

13.2.20 The Proposed Development would generate the following types of waste during construction, which will be considered in the assessment:

- Demolition wastes;
- Excavation wastes; and
- Construction wastes.

13.2.21 During the operational phase, waste related to logistics and distribution, including waste associated with the rail terminal, is expected to be generated. The assessment of this potential waste output has been undertaken using typical weekly waste arisings from British Standard BS 5906:2005[4].

[4] British Standards Institute (2005) 'BS5906:2005 Waste management in buildings – Code of Practice'. Available from: https://www.rbkc.gov.uk/pdf/BS5906-2005.pdf

13.2.22 Following the requirements of DMRB LA 110, a material assets and waste assessment would be necessary for the Proposed Development. DMRB LA 110 requires that the following information on material assets and waste will be identified:

- Types and quantity of material use associated with operation of the existing road/site;
- Types and quantities of waste associated with operation of the existing road/site;
- Information on availability of key construction materials required for the Proposed Development;
- Types and quantities of materials required to construct the Proposed Development;
- Information on materials that contain secondary aggregate or recycled content;
- Information on any known sustainability credentials of materials to be consumed;
- The type and volume of materials that will be recovered from off-site sources for use on the Proposed Development;
- The cut and fill balance; and
- Details of onsite storage and stockpiling arrangements, and any supporting logistical details.

13.2.23 As the Proposed Development progresses, any assumptions and limitations on data gaps will be reported in the final version of the ES.

13.2.24 To minimise the effects from material assets usage and waste production, the assessment will identify the location and capacity of sensitive local receptors (including designated sites identified in other environmental topics). The Study Area would need to be increased if these receptors would not have the capacity to accept all waste produced by the Proposed Development.

Assessing the Sensitivity of a Receptor

13.2.25 The significance of waste arisings is largely based on the nature of the waste, the location and capacity of local and regional waste management facilities and the sustainability of the disposal or processing method.

13.2.26 Overall, the purpose of a waste management assessment is to characterise development waste types and arisings and to identify existing and potential methods employed for their management, as well as the significance of change associated with a Proposed Development in comparison to the current and likely future situation without the Proposed Development. For the purposes of this assessment, a methodology has been utilised that allocates a ‘score’ based on various considerations of waste type and quantity, as well as disposal.

13.2.27 This approach broadly conforms with the standard EIA approach of assessing significance as a function of the magnitude of impact and sensitivity of receptors. In this case, magnitude of impact and proximity and sustainability of receptors. IEMA Guidance[1] divides the assessment of the sensitivity into the sensitivity of materials as a receptor and the sensitivity of landfill void capacity.

13.2.28 The sensitivity of materials can be determined by identifying where one or more of the criteria displayed in **Table 13.2** are met.

Table 13.2: Assessment Criteria for the Sensitivity of Material Receptors

MATERIALS	
Negligible	Are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock; and/or Are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials.
Low	Are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; and/or Are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	Are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock; and/or Are available comprising some sustainable features and benefits compared to industry-standard materials
High	Are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock; and/or Comprise little or no sustainable features and benefits compared to industry-standard materials.
Very High	Are known to be insufficient in terms of production, supply and/or stock; and/or Comprise no sustainable features and benefits compared to industry-standard materials.

13.2.29 The sensitivity of landfill void capacity can be determined using the criteria within **Table 13.3** and **Table 13.4**.

Table 13.3: Inert and Non-hazardous Landfill Void Capacity Sensitivity

WASTE	
Across construction and/or operation phases, the baseline/future baseline (i.e. without development of regional (or where justified, national) inert and non-hazardous landfill void capacity is expected to…	
Negligible	...remain unchanged or is expected to increase through a committed change in capacity.
Low	...reduce minimally: by <1% as a result of wastes forecast.
Medium	...reduce noticeably: by 1-5% as a result of wastes forecast.
High	...reduce considerably: by 6-10% as a result of wastes forecast.
Very High	... reduce very considerably (by >10%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand

Table 13.4: Hazardous Landfill Void Capacity Sensitivity

HAZARDOUS WASTE	
Across construction and/or operation phases, the baseline/future baseline (i.e. without development of regional (or where justified, national) hazardous landfill void capacity is expected to…	
Negligible	...remain unchanged, or is expected to increase through a committed change in capacity.
Low	...reduce minimally: by <0.1% as a result of wastes forecast.
Medium	...reduce noticeably: by 0.1-0.5% as a result of wastes forecast.
High	...reduce considerably: by 0.5-1% as a result of wastes forecast.
Very High	... reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.

13.2.30 The quantity of waste will be assessed by interrogating the designs for the Proposed Development, and by using professional judgement. An interpretation is then made as to whether it is likely to be hazardous.

Assessing the Magnitude of Impacts

13.2.31 Impacts are identified as the physical changes to the environment attributable to the Proposed Development. The magnitude of the impact has been described using the criteria defined within each topic chapter and then the likely environmental effects have been identified.

13.2.32 Impacts have been described as beneficial or adverse, and the potential magnitude of this effect rated from major to negligible / no change. The criteria is based on that set out in IEMA guidance.

13.2.33 Impacts have been divided into those occurring during the construction phase and those occurring during operation. As set out above, interim assessment years have been considered, where construction and operational activities may overlap. Where appropriate, chapters have referred to temporary and permanent impacts (where temporary impacts are those that last for a limited period of time).

13.2.34 The impacts related to land take have been assessed as part of the construction process within the year that the impact would occur. These impacts could be considered either temporary or permanent depending on whether the land would be restored following completion of the construction phase.

13.2.35 IEMA Guidance[1] divides the assessment of the magnitude of impacts into the sensitivity of materials as a receptor and the sensitivity of landfill void capacity.

13.2.36 The magnitude of impact from materials can be determined using the criteria in **Table 13.5**.

Table 13.5: Assessment Criteria for the Magnitude of Impacts from Materials

MATERIALS	
The assessment is made by determining whether, through a development, the consumption of:	
No change	…no material is required.
Negligible	...no individual material type is equal to or greater than 1% by volume of the regional baseline availability.
Minor	...one or more materials is between 1-5% by volume of the regional baseline availability; and/or the development has the potential to adversely and substantially impact access to one or more allocated mineral site (in their entirety), placing their future use at risk.
Moderate	...one or more materials is between 6-10% by volume of the regional baseline availability; and/or one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.
Major	...one or more materials is >10% by volume of the regional baseline availability; and/or more than one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.

13.2.37 The magnitude of impact from inert and non-hazardous waste can be determined using criteria within **Table 13.6**.

Table 13.6: Assessment Criteria for the Magnitude of Impacts from Inert and Non-hazardous Waste

WASTE	
No change	Zero waste generation and disposal from the development.
Negligible	Waste generated by the development will reduce regional landfill void capacity baseline by <1%.
Minor	Waste generated by the development will reduce regional landfill void capacity baseline by 1-5%.
Moderate	Waste generated by the development will reduce regional landfill void capacity baseline by 6-10%.
Major	Waste generated by the development will reduce regional landfill void capacity baseline by >10%.

13.2.38 The magnitude of impact from hazardous waste can be determined using criteria within **Table 13.7**.

Table 13.7: Assessment Criteria for the Magnitude of Impacts from Inert and Hazardous Waste

HAZARDOUS WASTE	
No change	Zero waste generation and disposal from the development.
Negligible	Waste generated by the development will reduce national landfill void capacity baseline by <0.1%.
Minor	Waste generated by the development will reduce national landfill void capacity baseline by 0.1-0.5%.
Moderate	Waste generated by the development will reduce national landfill void capacity baseline by 0.5-1%.
Major	Waste generated by the development will reduce national landfill void capacity baseline by >1%.

Assessing the Significance of Impacts

13.2.39 Effect is the term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by considering both the magnitude of the impact and the sensitivity of the receptor affected.

13.2.40 The magnitude of an impact does not generally directly translate into significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value, or a large impact on a resource of local value. In broad terms, therefore, the significance of the effect can depend on both the impact magnitude and the sensitivity or importance of the receptor.

13.2.41 The significance of impact can be determined using the sensitivity of receptor and the magnitude of impact to identify thresholds as shown in **Table 13.8**.

Table 13.8: Thresholds of Impacts

	MAGNITUDE OF IMPACT					
SENSITIVITY OF RECEPTOR		**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

13.2.42 Impacts which reach a threshold of moderate or above are considered significant. Where the threshold is "slight or moderate", professional judgement should be used in combination with documented justification, to determine a final outcome.

13.2.43 Where a range of significance levels are presented, the final assessment for each effect is based upon expert judgement.

13.2.44 In all cases, the evaluation of receptor sensitivity or value, impact magnitude and significance of effect has been informed by professional judgement and is underpinned by narrative to explain the conclusions reached.

13.2.45 A description of the significance levels, assigned taking account of proposed mitigation, is as follows:

- *Major:* These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process;

- *Moderate:* These beneficial or adverse effects may be important but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision- making if they lead to an increase in the overall adverse effect on a particular resource or receptor;
- *Minor:* These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process but are important in enhancing the subsequent design of the Proposed Development;
- *Negligible:* No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Assessing Cumulative Effects

13.2.46 The Study Area for the consideration of cumulative effects has been developed considering the predicted extent of impacts associated with waste regarding the Proposed Development, and with the point at which the associated effects become insufficient to contribute in any meaningful way to those of another development.

13.2.47 A precautionary approach has been adopted in the definition of the Study Area to help to ensure that all potentially significant effects (including cumulative effects) have been effectively identified. Information on the likely extent of impacts associated with other developments in the area has also been considered. Where sufficient information exists, the Study Area includes all known proposed developments in the surrounding area that could potentially result in cumulative effects. Assessing the cumulative effects against operational waste can be undertaken by a review of projects in the pipeline for the region, by a review of local development plans (stating future housing and other development requirements), and waste policy. Oxfordshire County Council produced a Minerals and Waste Core Strategy in 2017 and this is referred to and used for assessing the operational cumulative effects in this chapter.

Identifying Potential Mitigation Measures

13.2.48 Where mitigation measures are anticipated at this preliminary stage, they have been identified using engineering judgement based on IEMA Guidance and experience from previous projects. Mitigation is set-out in section 13.6 of this chapter.

Limitations and Assumptions

13.2.49 The impacts associated with the bi-products and associated wastes from the extraction of raw materials and the manufacture of products outside of the Study Area are excluded from the scope. These stages of a product's or a material's life cycle will have been subjected to environmental assessment and are therefore outside the scope of this assessment.

13.2.50 At the time of writing, data in relation to the quantities of demolition waste generated by the Proposed Development has not yet been finalised. At this preliminary stage demolition waste is not anticipated to represent a significant source of waste and the

absence of the demolition waste quantities in this draft chapter is unlikely to impact the assessment of likely significant effects. The quantities of demolition waste will be available to inform the assessment presented in the submission of the final ES.

13.2.51 The effects associated with the transportation of materials (Greenhouse gas (GHG) emissions, air quality, noise, etc) are not covered within this methodology and will be addressed in the relevant environmental topics of the ES.

13.2.52 The assessment of waste during the operational phase relates to the production of waste from structures within the Main Site only. It excludes waste associated with Highway Works as minimal waste is expected to be generated once the Highway is operational.

13.2.53 Mitigation measures to reduce the impacts of material assets and waste impacts from the Proposed Development will follow the principles of sustainable resource and waste management in accordance with the waste hierarchy as described in DMRB LA 110 (see Image 11-4: Waste hierarchy).

13.2.54 The information not available at this stage to inform the material assets and waste assessment is summarised in **Table 13.9**. It is expected that this information will be available to inform the ES, or that reasonable assumptions will be agreed (where dependent on construction methodologies to be confirmed during the construction stage for example), as described in the table below.

Table 13.9: The Information not currently available in the material assets and waste assessment

Current Gaps	Information available and reason at the time of writing	Information that will be available for the submission of the ES
Material use - Categories and quantities of materials consumed by the Proposed Development, including the volume of materials that will be required from offsite sources	Construction phase planning is at a very early stage, with only high level phasing and earthworks information available	Type of materials that will be required from offsite sources for use on the Proposed Development will identified in the ES
Material sources – details of the sources of materials and potential suppliers	Specific materials required not yet confirmed due to early stage of construction planning(end users and requirements not identified).	Type of materials to be used in the illustrative specifications for the build will be appraised in the ES.
Mineral Safeguarding Sites and Peat Resources – confirmation of locations	Information presented in this draft chapter is preliminary, based on the current draft DCO boundary	The sterilisation of Mineral Safeguarding Sites and Peat.
Sustainability credentials	Quantification and specification of materials required for the Proposed Development not yet available. Sustainability credentials of materials, including secondary aggregate and recycled content of materials considered at a high level	Materials required by the Proposed Development and approximate quantities will be available for ES, allowing a more detailed review of sustainability credentials.
Demolition	Quantities of demolition waste generated by the Proposed Development are to be estimated. The general types of demolition waste and the approach to manage these materials are considered in the draft chapter, in the context of construction waste volumes and are not expected to be significant.	The quantities of demolition waste will be available in the ES.
Earthworks estimates	Only high level earthworks information is available	Detailed earthworks estimates will be available in the final ES.
Contaminated materials	Chemical analysis from Ground Investigation not yet complete, therefore consideration of existing contamination is based on historic uses of the land, and any recorded instances of historical contamination events.	Detailed contamination assessment will be finalised for the ES and used to inform the waste assessment. An Environmental Management Plan (EMP) will be developed

Assumptions

13.2.55 The consideration of material resources is based on maximising the beneficial reuse of materials arising from the demolition of existing structures and construction of the Proposed Development (e.g. excavated material). Only if excavated material is surplus to requirement or if it is unsuitable for use in the construction of the Proposed Development or specified receiver / donor sites 5will it be transported off-site as waste.

13.2.56 The principal objective of sustainable waste and material resource management is to use material resources more efficiently, thereby preventing and reducing the amount of waste generated, as well as minimising the quantity of waste that requires final disposal to landfill. It is proposed that waste and materials will be dealt with in line with the UK Government's 'waste hierarchy', which is a statutory requirement for sustainable waste and material resource management under regulation 15(1) of the Waste (England and Wales) Regulations 2011[6].

13.2.57 The waste hierarchy generally describes a priority order of what constitutes the best overall environmental option for the management of waste. It advocates the use of disposal of waste only as a last resort, due to the range of potential adverse environmental effects associated with its use, such as: the loss of valuable land resources; emissions of greenhouse gases (GHG); and nuisance effects (e.g. dust and odour emissions).

13.3 POLICY CONTEXT

13.3.1 As a producer of waste, the Proposed Development must consider a range of waste legislation. This section details relevant legislation, policy and guidance at the national, regional and local levels.

National Legislation and Policy

Environment Act 2021

13.3.2 Part 3 Section 57 of the Environment Act[7] (2021), sets out a number of provisions related to industrial/commercial waste including the following:

- "*Recyclable relevant waste must be collected separately from other relevant waste"*; and

[5] 'Receiver' and/or 'donation' sites are managed and regulated waste management facilities by Contaminated Land: Applications in Real Environments (CL:AIRE)
[6] HM Government (2011) 'The Waste (England and Wales) Regulations'. Available from: https://www.legislation.gov.uk/uksi/2011/988/contents/made
[7] HM Government (2021) 'Environment Act 2021' Available from: https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted

- *Recyclable relevant waste in each recyclable waste stream must be collected separately*" unless "*it is not technically or economically practicable to collect recyclable relevant waste in those recyclable waste streams separately, or collecting recyclable relevant waste in those recyclable waste streams separately has no significant environmental benefit*".

13.3.3 Recyclable relevant waste is defined in the Act as any of the following materials: glass; metal; plastic; paper/card; and food waste.

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

13.3.4 The Infrastructure Planning (Environmental Impact Assessment) Regulations[8] sets out the basis for when developments are required to be subject to an EIA and the topics that should be included within the ES.

13.3.5 Schedule 4 paragraph 1 (d) stipulates that the description of the development to be assessed in the ES should include: *"an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases"*.

The Waste (England and Wales) Regulations 2011 (and amendments)

13.3.6 The Waste Regulations implement revisions to the Waste Framework Directive in England and Wales. They apply the waste hierarchy which details methods to reduce waste generation and the amount of waste sent to landfill. The stages of the waste hierarchy and examples of each stage, which were provided by the Department of Environment, Food and Rural Affairs[9], are given in **Table 13.10**.

Table 13.10: Stages of the Waste Hierarchy

Stages	Examples
Prevention	Using less material in design and manufacture. Keeping products for longer; re use. Using less hazardous materials.
Preparing for re-use	Checking, cleaning, repairing, refurbishing, whole items or spare parts.
Recycling	Turning waste into a new substance or product. Includes composting if it meets quality protocols.

[8] HM Government (2017) 'The Infrastructure Planning (Environmental Impact Assessment) Regulations'. Available from: https://www.legislation.gov.uk/uksi/2017/572/contents/made
[9] Department for Environment, Food and Rural Affairs (2011) 'Guidance on applying the Waste Hierarchy' Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69403/pb13530-waste-hierarchy-guidance.pdf

Other recovery	Includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling.
Disposal	Landfill and incineration without energy Recovery.

The Environmental Permitting (England and Wales) Regulations 2016 (as amended)

13.3.7 The Environmental Permitting Regulations[10] aim to ensure that waste activities are authorised and that their discharges do not harm human health or the environment. For the Proposed Development, environmental permits must be granted by the EA. The Regulations combine the requirements for an integrated waste management approach and for hazardous waste management. This provides a framework for regulation that enables the EA to assess permitting and compliance.

The Hazardous Waste (England and Wales) Regulations 2005

13.3.8 The Hazardous Waste Regulations[11] set out the regime for the control and tracking of hazardous waste in England and Wales. These regulations introduced a process of registration of hazardous waste producers and a new system for recording the movement of waste.

Other National Legislation of Relevance

13.3.9 Additional legislation pertinent to this Chapter includes:

- Environmental Protection Act 1990 (as amended);
- Control of Pollution (Amendment) Act 2012;
- Controlled Waste (England and Wales) Regulations 2012; and
- The Environmental Damage (Prevention and Remediation) Regulations 2015.

Waste Management Plan for England 2021

13.3.10 The Waste Management Plan for England[12] provided an analysis of the waste management situation in England, and evaluated how it would support implementation of the objectives and provisions of the European Union's revised Waste Framework Directive.

[10] HM Government (2016) 'The Environmental Permitting (England and Wales) Regulations'. Available from: https://www.legislation.gov.uk/uksi/2016/1154/contents/made
[11] HM Government (2005) 'The Hazardous Waste (England and Wales)Regulations 2005' Available from: https://www.legislation.gov.uk/uksi/2005/894/made
[12] Department for Environment, Food and Rural Affairs (2021) 'Waste Management Plan for England' Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/955897/waste-management-plan-for-england-2021.pdf

13.3.11 In relation to the management of waste during construction and demolition, this plan stated that: *"we are continuing to comfortably exceed the target to recover 70% of non-hazardous construction and demolition waste by 2020. The annual recovery rate for construction and demolition in England has remained at around 92% since 2010. In 2016, the recovery rate was 92.1%"* (p.17).

Waste Management Hierarchy

13.3.12 The waste management principles of the waste hierarchy are now fully incorporated in the Waste Management Plan for England as objectives to be delivered through waste local plans. These principles are outlined in **Table 13.11.**

Table 13.11: Waste Management Principles

Principle	Description
Waste Hierarchy	A theoretical framework used as a guide to the waste management options that should be considered when assessing the BPEO
Waste as a Resource	Certain wastes can be directly used or separated / processed for use as a replacement for raw materials, saving resources and potentially reducing energy use or other impacts associated with virgin resource extraction and transport.
Proximity Principle	Certain wastes can be directly used or separated / processed for use as a replacement for raw materials, saving resources and potentially reducing energy use or other impacts associated with virgin resource extraction and transport.
Regional Self-sufficiency	Where practical, waste should be treated or disposed of within the region in which it is produced.
Best Practicable Environmental Option (BPEO)	Defined by the Royal Commission on Environmental Pollution (1988) as the outcome of a systematic and consultative decision making procedure which emphasises the protection and conservation of the environment across land, air and water". The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefits, as a whole, at acceptable cost, in both the short term and the long term. SA is designed to ensure compliance with SEA and as such includes for requirements on environmental decision making such as an opportunity for the public to express their opinion on draft plans (community involvement), take into account significant environmental effects including those on human health, material assets and climatic factors and a full assessment of alternative options and reasons why alternatives have been assessed and why others have not.

National Planning Policy for Waste 2014

13.3.13 The National Planning Policy for Waste[13] provides *"a framework in which communities and businesses are engaged with and take more responsibility for their own waste, including by enabling waste to be disposed of…in line with the proximity principle"* (pg. 3).

13.3.14 It also aims to ensure that: *"the design and layout of new residential and commercial development and other infrastructure (such as safe and reliable transport links) complements sustainable waste management, including the provision of appropriate storage and segregation facilities to facilitate high quality collections of waste"* (pg. 3).

National Policy Statement for National Networks 2014

13.3.15 The National Policy Statement (NPS) for National Networks[14], produced by the Department for Transport, sets out the need for, and the Government's policies to, the management of waste when delivering a Nationally Significant Infrastructure Project (NSIP) on the national road and rail networks in England.

13.3.16 In relation to waste-related obligations of a proposed development, this NPS states that: *"the applicant should set out the arrangements that are proposed for managing any waste produced. The arrangements described should include information on the proposed waste recovery and disposal system for all waste generated by the development. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that the alternative is the best overall environmental outcome"* (paragraph 5.42).

Our Waste, Our Resources: A Strategy for England 2018

13.3.17 The Our Waste, Our Resources: A Strategy for England[15] builds on the previous national waste strategies of 2000 and 2007 and contains actions and commitments which set a clear direction towards a zero-waste economy.

[13] Department for Communities and Local Government (2014) 'National Planning Policy for Waste'. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/364759/141015_National_Planning_Policy_for_Waste.pdf
[14] Department of Transport (2014) 'National Policy Statement for National Networks'. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387222/npsnn-print.pdf
[15] HM Government (2018) 'Our Waste, Our Resources: a Strategy for England' Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

National Planning Policy Framework 2021

13.3.18 The National Planning Policy Framework[16] (NPPF) sets out the Government's planning policies for England. The NPPF must be taken into account in preparing development plans and is a material consideration in planning decisions. The policy sets out objectives for sustainable development which includes protecting and enhancing our natural, built and historic environment through minimising waste and pollution.

13.3.19 In relation to the sustainable use of materials, paragraph 209 states that: *"it is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs. Since minerals are a finite natural resource, and can only be worked where they are found, best use needs to be made of them to secure their long-term conservation".*

Regional and Local Policies

Oxfordshire County Council Minerals and Waste Core Strategy 2017

13.3.20 Paragraph 3.4 of the Oxfordshire County Council (OCC) Minerals and Waste Core Strategy[17] states the aim to: *"Facilitate the efficient use of Oxfordshire's mineral resources by encouraging the maximum practical recovery of aggregate from secondary and recycled materials for use in place of primary aggregates"*.

13.3.21 OCC are aiming to achieve a rate of 70% for recycled and secondary aggregate waste by 2031, which includes waste from construction, demolition and excavation works.

13.3.22 In relation to waste planning, this document states that: *"the underlying philosophy is to seek to reduce waste generation and to see waste as a resource, through maximizing reuse, recycling and composting and recovery of value from residual waste"* (p. 34).

13.3.23 OCC plan to provide waste management facilities in strategic locations so: *"facilities will be located and managed to minimise the use of unsuitable roads, particularly through settlements, and other harmful impacts of waste management development on Oxfordshire's communities and natural and historic environment*" (p. 34). OCC wish *"to provide for waste to be managed as close as possible to where it arises…"* so as to:

- "*Minimise the distance waste needs to be transported by road;*

[16] Ministry of Housing, Communities & Local Government (2021) 'National Planning Policy Framework'. Available from: https://www.gov.uk/government/publications/national-planning-policy-framework--2
[17] Oxfordshire County Council (2017) 'Minerals and Waste Core Strategy'. Available from: https://www2.oxfordshire.gov.uk/cms/sites/default/files/folders/documents/environmentandplanning/planning/mineralsandwaste/September2017/AdoptedMineralsWasteCoreStrategySept2017.pdf

- *Reduce adverse impacts of waste transportation on local communities and the environment; and*
- *Enable communities to take responsibility for their own waste*" (p. 35).

13.3.24 **Policy W2: 'Oxfordshire waste management targets'** sets out OCC's waste management targets for commercial / industrial, as well as construction, demolition and excavation (CDE) waste to be met by the years 2021, 2026 and 2031. According to this policy, "*Oxfordshire's non-hazardous waste that is sent to landfill to reduce to no more than 5% of arisings by 2026*" (p. 84). Waste management for the Proposed Development would aim to match or exceed these targets for both the construction and operational phases.

13.3.25 It is estimated that approximately 1.033 million tonnes of non-hazardous CDE waste are created within Oxfordshire each year and it is expected that "*existing waste management facilities will provide much of the waste management capacity required*" (pg. 74). The available capacity expected across Oxfordshire for specific years up to 2031 are shown in **Table 13.12.** These figures are taken from Table 6 of the OCC Minerals and Waste Core Strategy 2017 (p. 74).

Table 13.12: Capacity Available to Manage Waste at Existing Facilities 2016 – 2031 (tonnes per annum)

Type of waste management	2016	2021	2026	2031
Non-hazardous waste recycling	598,900	429,900	429,900	317,800
Composting / food waste treatment	219,600	219,600	214,600	214,600
Non-hazardous residual waste treatment	300,000	300,000	300,000	300,000

13.3.26 At the time the Minerals and Waste Core Strategy 2017 was made, projections of capacity for the management of non-hazardous waste recycling predicted that Oxfordshire would not have enough capacity by 2021. However, the strategy planned to provide additional waste facilities to meet their needs, as set out in **Policy W3: 'Provision for waste management capacity and facilities required'**.

13.3.27 In relation to inert waste, *"in 2013 there were ten licensed inert waste 'disposal'65 facilities operating in Oxfordshire with a collective void space of some 4.2 million cubic metres"* (p. 86). Shellingford Quarry, which has permission to operate until 2028, and Shipton-on-Cherwell Quarry, which has permission to operate until 2025, provide most of the capacity to manage inert waste in Oxfordshire. These facilities are expected to provide sufficient capacity to manage inert until at least 2025 and OCC plan to provide additional facilities to meet future demand.

Cherwell District Council Local Plan 2011 - 2031

13.3.28 According to **Policy BSC 9: Public Services and Utilities** of the Cherwell District Council Local Plan 2011 – 2031[18], "Waste management and disposal is the responsibility of Oxfordshire County Council and the District Council will continue to consider the emerging Minerals and Waste Development Framework in the preparation of the Local Plan" (p. 72).

13.3.29 **Policy ESD 3: Sustainable Construction** sets out the following policies which are of relevance to the management of waste during the construction of the Proposed Development:

- "*All new non-residential development will be expected to meet at least BREEAM 'Very Good' with immediate effect, subject to review over the plan period to ensure the target remains relevant. The demonstration of the achievement of this standard should be set out in the Energy Statement; and*

- *All development proposals will be encouraged to reflect high quality design and high environmental standards, demonstrating sustainable construction methods including but not limited to*:

    - *Minimising both energy demands and energy loss;*
    - *Maximising passive solar lighting and natural ventilation;*
    - *Maximising resource efficiency;*
    - *Incorporating the use of recycled and energy efficient materials;*
    - *Incorporating the use of locally sourced building materials;*
    - *Reducing waste and pollution and making adequate provision for the recycling of waste;*
    - *Making use of sustainable drainage methods;*
    - *Reducing the impact on the external environment and maximising opportunities for cooling and shading (by the provision of open space and water, planting, and green roofs, for example); and*
    - *Making use of the embodied energy within buildings wherever possible and re-using materials where proposals involve demolition or redevelopment*".

[18] Cherwell District Council (2015) 'The Cherwell Local Plan 2011 – 2031' Available from: https://www.cherwell.gov.uk/downloads/download/45/adopted-cherwell-local-plan-2011-2031-part-1-incorporating-policy-bicester-13-re-adopted-on-19-december-2016

Guidance

13.3.30 Highways England's (now National Highways) LA 110 Material assets and waste guidance[19] will be considered when undertaking the assessment of effects of waste in relation to the Highway Works.

13.3.31 In accordance with this guidance, the assessment of material assets and waste shall include:

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

13.3.32 This assessment has been carried out in accordance with guidance laid out in IEMA's Guide to Materials and Waste in EIA[1].

Summary of Regulation, Policy and Guidance

13.3.33 The key requirements that arise from the regulation, policy and guidance are as follows:

- Waste must be stored in such a way as to prevent it from causing damage to the environment or posing a risk to human health;
- The waste hierarchy must be applied in both the construction and operation of new developments, and waste reduction and re-use should be prioritised;
- Duty of Care obligations for businesses to dispose of all their recyclable materials and commercial waste must be implemented;
- The impact of new development on waste management facilities should not prejudice the implementation of the waste hierarchy and/or efficient operation of such facilities;
- At least 70% (by weight) of waste from construction and demolition should be either reused or recycled; and
- To achieve a BREEAM "Very Good" rating, the Proposed Development should aim for the BREEAM target of diverting 70% (by volume) and 80% (by weight) of non-hazardous construction waste from landfill, and 80% (by volume) and 90% (by weight) of demolition waste.

[19] Highways England's (now National Highways) LA 110 Material assets and waste guidance – available at: file:///C:/Users/Rob/Downloads/LA%20110%20Material%20assets%20and%20waste-web%20(1).pdf

13.4 BASELINE CONDITIONS

Existing Baseline

13.4.1 At present the Main Site mainly comprises agricultural fields with associated farmland small holding. An unnamed road, which runs in an east-west direction through the middle of the Main Site. and a composting waste facility, which will be re-located from its current location at the south-east of the Main Site to the south-west of the Main Site.

13.4.2 Severn Trent Green Power IVC facility, which is an operational commercial food and garden waste composting facility, is located within the Main Site. This facility comprises a weighbridge, reception building, composting tunnels, office and welfare facility, bio filter and maturation pad. It receives up to 35,000 tonnes of organic waste per year which is turned into bagged compost product.

13.4.3 The Main Site is currently a source of agricultural and green waste and small quantities of commercial waste from JW Pickford & Son farm. The exact quantities of waste currently generated from the Main Site are unknown but any waste from the agricultural activities is considered to be negligible.

13.4.4 The east of the Main Site is bounded by the B430 to the east with Ardley Fields Household Waste & Recycling Centre, Ardley Landfill Site and Viridor ERF beyond. To the south of these waste facilities is an active Dewars Farm minerals quarry (limestone and clay) operated by Smiths Bletchington. Agricultural fields lie to the south and south-west. Chillgrove Drive bounds the west of the Main Site with the town of Heyford Park beyond.

Ground Conditions

13.4.5 A geological baseline and assessment is presented in Chapter 11: Ground Conditions. This includes information and appraisal of areas of historical landfill present to the east of the Main Site (described as infilled ground - Ardley Landfill) and immediately to the north-west, north the Main Site.

Receptor – Mineral Resources

13.4.6 No area of the Main Site is located within a Coal Authority reporting area. Ground conditions comprise topsoil over weathered deposits of the White Limestone formation with solid bedrock from approximately 1m. Superficial deposits of alluvium were identified in the vicinity of streams and comprised a mixture of clays, sands, and gravels.

13.4.7 A number of quarries have been identified in the surrounding area which provide mineral sources. These are summarised in **Table 13.13**. There is no publicly available data on the capacity of the quarries that serve this area.

Table 13.13: Regional quarries identified within a 30 km radius of the Main Site

Quarry Name	Operator	Address	Distance from Site
Smith Ardley	Smiths Blechington	B430, Bicester OX25 4AE	200 m east
Wroxton Quarry	Peter Bennie LTD	Stratford Road, A422, Wroxton Heath, Banbury OX15 6EZ	19 km north-west
Rollright Quarry	Smiths Blechington	Unnamed Road, Chipping Norton OX7 5QD	25 km west
Passenham Quarry	GRS Group	Buckingham Rd, Deanshanger, Milton Keynes MK19 6JT	25 km north-west
Burford Quarry	Smiths Blechington	Burford Rd, Carterton OX18 3WN	29 m south-west

13.4.8 According to OCC's most recent Local Aggregate Assessment[20], total permitted reserves of sharp sand and gravel in Oxfordshire at the end of 2018 were 12.925 megatonnes (mt), which equated to a supply for 12.3 years based on OCC's predicted demand of 1.015 mt per year. Total permitted reserves for soft sand in Oxfordshire at the end of 2018 were 3.091mt, which equated to a supply for 12.7 years based on OCC's predicted demand of 0.243 mt per year. Total permitted reserves for crushed rock in Oxfordshire at the end of 2018 were 7.718mt, which equated to a supply for 9.9 years based on OCC's predicted demand of 0.778 mt per year.

13.4.9 Information within the Local Aggregate Assessment confirms that Oxfordshire has a large existing supply of sharp sand and gravel, soft sand and crushed rock. However, the assessment states the need to identify sites to ensure sufficient supply of the following amounts up to the end of the local plan period (2031):

- Sand and Gravel - 3.637 mt;
- Soft Sand - 0.641 mt; and
- Crushed rock - 1.978 mt.

[20] Oxfordshire County Council (2019) 'Local Aggregate Assessment' Available from: https://mycouncil.oxfordshire.gov.uk/(S(33rhih553gpijjinuki3kvf55))/documents/s48917/CA_NOV1919R06%20LAA2019%20Final%20Report%20Oct%202019.pdf?txtonly=1

Receptor - Existing Facilities for the Deposition of Waste

13.4.10 The capacity and annual waste data received from active landfill sites within 30 kilometers (km) of the Main Site has been summarised in **Table 13.14**. The site name, address and types of materials accepted are also given. This data has been collated from the Environment Agency's '2020 Remaining Landfill Capacity'[21] and '2020 Waste Data Interrogator'[22]. The majority of the waste facilities within this table are located in Oxfordshire. However, the nearest waste facilities to the Main Site in Aylesbury Vale, Buckinghamshire, have also been added:

13.4.11 At this preliminary stage, to ensure that a worst-case scenario has been considered, waste of all types received by facilities in **Table 13.14** are included rather than just waste types which would be produced by the Proposed Development during both the construction and operational phases. This table will be reviewed and updated if required in the final ES.

Table 13.14: Key Details of Waste Facilities in Proximity to the Main Site

Facility Name	Address	Location from the Site	Local Authority	Site Type	Total tonnes Received 2020	Remaining Capacity (m^3) as of end 2020
Oxfordshire						
Finmere Quarry Landfill EPR/TP3436YQ	Banbury Road, Finmere MK18 4AJ	11 km north-east	Cherwell	Non Hazardous LF	91,570	419,061
Shipton Quarry	Shipton On Cherwell, Oxfordshire, OX5 3EL,	11.5 km south-east	Cherwell	Inert Landfill and Physical Treatment	151,480	548,100
Restoration Landform	Blenheim Palace, Woodstock, Oxon, OX20 1PP	14 km south-west	West Oxfordshire	Inert Landfill	No information available	300,000
Woodeaton Quarry	Noke, Woodeaton, Oxfordshire, OX3 9TJ	15 km south	Cherwell	Inert Landfill	72,634	238,040
Upwood Quarry	Besselsleigh, Abingdon, Oxfordshire, OX13 5DW	29 km south-west	Vale of White Horse	Inert Landfill	No information available	327,449
Sutton Courtenay Landfill	Appleford Sidings, Sutton	33 km south	Vale of White Horse	Non Hazardous Landfill	325,890	2,257,097

[21] Environment Agency (2021) 'Remaining Landfill Capacity' Available from: https://data.gov.uk/dataset/237825cb-dc10-4c53-8446-1bcd35614c12/remaining-landfill-capacity
[22] Environment Agency (2021) '2020 Waste Data Interrogator' Available from: https://find-data-beta.cloudapps.digital/dataset/bb40d091-a346-4b75-aa54-df7d347bed93/2020-waste-data-interrogator

Facility Name	Address	Location from the Site	Local Authority	Site Type	Total tonnes Received 2020	Remaining Capacity (m^3) as of end 2020
EPR/BV7001IK	Courtenay, Abingdon OX14 4PW					
Sutton Courtenay Landfill - Phase 3 - EPR/TP3330AT	Sutton Courtnay Office,Applefford Sidings,,Sutton Courtenay,Abingdon,Abingdon,Oxon OX14 4PW	33 km south	Vale of White Horse	Non Hazardous Landfill	52,959	697,262
Buckinghamshire						
Calvert Landfill Site - Pit 6 - EPR/BP3637AF	Brackley Lane, Calvert, Buckingham, MK18 2HF	15 km east	Aylesbury Vale	Non Hazardous Landfill	577,445	5,405,407
Calvert Landfill (Pits 4&5) - EPR/BS8605IQ	Brackley Lane, Calvert, Buckingham MK18 2HF	15 km east	Aylesbury Vale	Non Haz (SNRHW) Landfill	241,160	1,953,890

13.4.12 By assessing the cumulative landfill void capacity of the receptors set-out in **Table 13.14** above, the calculation in **Figure 13.15** below determines that the regional landfill void capacity forecasted for 2025 is 11.5 Million tonnes based on a projection of the quantity of material received in 2020 over a 5 year period against the 2020 capacity. At this same rate of receiving material (1.8 Million tonnes per year), based on the assessment criteria presented **Table 13.2** in the methodology section, the sensitivity is assessed as very high.

Table 13.15: Regional non hazardous / inert landfill capacity and received waste

Total Capacity of 17 sites 2020	= 13.02 million (M) m^3
• At 1.2 tonnes per m^3	= 15.6 M tonnes
• Total material received 2020	= 1.8 M tonnes
• 2020 sensitivity	= 1.8/15.6 x 100% = 11.5 % (very high)
Projection of 5 years based on 1.8 M tonnes per year	
• 5 year tonnage	= 9 M tonnes
• 2025 Total Capacity	= 6.6 M tonnes
• 2025 Sensitivity	= 1.8/6.6 x 100% = 27% (very high)

13.4.13 Based on the EA Waste Data Interrogator 2020, there are a limited number of hazardous waste landfill sites nationally. The management and disposal of hazardous waste is a specialist process and usually involves some interim treatment processes prior to disposal at landfill.

13.4.14 Two hazardous waste landfill sites were identified to include in a regional study. The key information for each is shown in **Table 13.16**.

Table 13.16: Hazardous Landfill Sites Considered for a Regional Assessment

Facility Name	Address	Location from the Site	Local Authority	Total tonnes Received 2020	Remaining Capacity (m^3) as of end 2020
Southam Landfill	Southam Road, Long Itchngton, Southam CV47 9RA	38 km north-west	Stratford upon Avon, Warwickshire	No information available	340,000
East Northants Resource Management Facility	Stamford Road, Kingscliffe, Peterborough PE8 6XX	86 km north-east	East Northampton shire, Northampton shire	209,432	962,110

13.4.15 The nearest hazardous landfill site is Southam Landfill, which is approximately 38 km north-west of the Main Site in Stratford upon Avon, Warwickshire. As of the end of 2020, this facility had a capacity of 340,000 m^3, however, there is no information on the amount of waste received. The only other hazardous waste landfill site considered to be regional is East Northants Resource Management Facility, which is located 86 km north-east of the Main Site. It received 209,432 tonnes of waste in 2020 and had a capacity of 962,110 m^3 as of the end of 2020. Table 13.17 below calculates the void capacity for Hazardous waste sites for 2020 and forecasted for 2025 both at a Regional and National level. In the Regional context, the sensitivity of waste receptors is considered very high. In the National context, the sensitivity of waste receptors is considered medium.

Table 13.17: Regional and National Hazardous Waste Landfill capacity and received waste

	Regional	Nationally
Capacity in 2020 (volume)	1.3 M m^3	16.4 M m3
Capacity in 2020 (tonnage) at 1.2[1] tonnes per m3	1.6 M tonnes[2]	19.7 M tonnes
Material received 2020	0.2 M tonnes	0.7 M tonnes
2020 sensitivity	13.2 M / 1.6 M x 100% = 12.5% (very high)	13.7 M / 19.7 M x 100% = 3.5% (medium)
Projection of material received in 5 year period	1 M tonnes	3.5 M tonnes
2025 Capacity based on 5 year projection	5.6 M tonnes	16.2 M tonnes
2025 sensitivity	0.2 M / 0.6 M X 100% = 33% (very high)	0.7 M / 16.2 M x 100% = 4.32% (medium)

13.4.16 Asbestos is considered a hazardous waste. Asbestos waste is however accepted at non hazardous landfill sites with SNRHW (Stable Non-Reactive Hazardous Waste) Cells.

Waste Material and Management Facilities

13.4.17 A review of waste management facilities located in Cherwell, West Oxfordshire and South Northamptonshire was conducted using the EA Waste Data Interrogator 2020. The sites presented in **Table 13.18** accepted Construction & Demolition waste at quantities of over 1,000 tonnes in that year.

Table 13.18: Facilities within 30km which accepted over 1,000 tonnes of Construction and Demolition waste in 2020

Site Name	Facility Type	Facility District	Tonnes Received
Ferris Hill Farm (OX15 5JY)	Non Hazardous Waste Transfer / Treatment	Cherwell	6,400
Cresswell Field, Worton Farm (OX29 4EB)	Physical Treatment	Cherwell	28,018
Shipton Quarry (OX5 3EL)	Physical Treatment	Cherwell	51,480
Hickman Landscapes (OX18 4BZ)	Non Hazardous Waste Transfer / Treatment	West Oxfordshire	2,428
B & E Waste Transfer Station (OX29 0XQ)	Non-Hazardous Waste Transfer	West Oxfordshire	10,867
Aggregates Recycling Facility (OX29 4EG)	Physical Treatment	West Oxfordshire	5,019
Gill Mill Quarry Recycling Facility (OX29 7PP)	Physical Treatment	West Oxfordshire	29,412
Sandfields Farm Waste Transfer Station (OX7 5PY)	Non Hazardous Waste Transfer / Treatment	West Oxfordshire	3,090
The Recycling Centre (NN7 3NA)	Non-Hazardous Waste Transfer	South Northamtonshire	8,196

13.4.18 As can be seen in **Table 13.18** above, there were ten waste transfer or treatment sites which accepted more than 1,000 tonnes of construction and demolition waste in 2020. These are sorting and recycling waste facilities which help to reduce the quantity of construction and demolition waste going to landfill. The sensitivity of this receptor is considered to be Low.

Future Baseline

13.4.19 The latest available information on material assets and waste infrastructure capacity has been used to inform the future baseline. Where information on likely trends is available, this is utilised to define the potential future baseline.

13.4.20 An increased demand on material assets in the UK is anticipated as a result of a number of compounding factors: Covid-19 has affected materials supplies; supply chains have been impacted due to global demand shocks, container shortages and port delays; and construction demand has increased due to new infrastructure projects (The possible impacts of materials shortages in the UK) (Royal Institution of Chartered Surveyors, 2021)[23].

13.4.21 In the UK, the Construction Products Association reported construction activity is anticipated to increase 13.7 % in 2021, year on year, and by 6.3 per cent in 2022, in part due to efforts to stimulate an economic recovery from Covid-19 (Construction Industry Forecasts - Summer 2021) (Construction Products Association, 2021)[24].

13.4.22 The Proposed Development will consume large quantities of key materials such as aggregates, concrete, asphalt and mortar, increasing the demand on the existing UK supply chain. The data on key material products used by the Proposed Development will be identified in this chapter when finalised.

13.4.23 It is anticipated that different types of waste infrastructure capacity will continue to be available during the construction and operation of the project. Landfill will experience some use of available capacity as void space is taken. Government policy measures are also likely to divert waste from landfill.

13.4.24 Permitted capacity data published by the Environment Agency has been used to estimate the projected landfill capacity for the Extended Study Area for the future baseline. This relates to the total capacity of inert, non-hazardous and hazardous waste landfill that will be available within all of the regional areas in the Extended Study Area through which route the Proposed Development will pass.

13.4.25 The remaining landfill capacity is displayed in Table 13.17. This will be reviewed and updated as required in the final ES.

[23] Royal Institution of Chartered Surveyors (2021), The possible impacts of materials shortages in the UK, available at: https://www.rics.org/uk/products/data-products/insights/the-possible-impacts-of- materials-shortages-in-the-uk/
[24] Construction Products Association (2021), Construction Industry Forecasts - Summer 2021, available at: https://www.constructionproducts.org.uk/publications/economics/construction-industry-forecasts/construction-industry-forecasts-summer-2021/

13.5 ASSESSMENT OF LIKELY EFFECTS

Construction Phase

13.5.1 The Proposed Development will consume large quantities of materials increasing demand on the existing UK supply chain. It is noted the majority of new materials would be sourced from within and outside the Study Area, but this is reported within the Study Area as that is the location that the materials are consumed. The volumes of key material products used by the Proposed Development will be identified in this chapter when finalised meeting the requirements of DMRB LA110, and will be contextualised with the volumes of aggregate reserves available within the Study Area.

Demolition Waste

13.5.2 The Proposed Development will result in the production of waste arising from Construction, Demolition and Excavation (CD&E) activities. The Proposed Development will generate large quantities of CD&E waste increasing the demand on the existing waste infrastructure. The data on CD&E waste generated by the Proposed Development has been assessed in this draft chapter and will be assessed further in the chapter when finalised.

13.5.3 Demolition of the buildings on the Main Site will produce a variety of waste materials including concrete, masonry, aggregates, ferrous and non-ferrous material, timber, glass, plasterboard and slate. A relatively small quantity of material is expected to be generated from these demolition works.

13.5.4 Further demolition waste will be generated through the clearance of existing infrastructure, including services, roads, and drains which will need to be removed prior to construction. These are likely to consist of hard and inert materials, soils, rock and stones, wood (including vegetation), asphalt, brick, concrete, and miscellaneous metals. Demolition waste is unlikely to represent a significant source of waste and the absence of the demolition waste quantities in this draft chapter are unlikely to impact the assessment of likely significant effects. The quantities of demolition waste will be available prior to submission.

13.5.5 It is anticipated that any green waste will be processed on the Main Site by the existing or proposed Seven Trent Green Power facility.

13.5.6 Existing roads will be demolished generating additional material. The amount of material has not been quantified, and instead will be included in the quantities for earthworks in the final ES. Material generated is anticipated to include crushed concrete, aggregate road base and road planings.

13.5.7 A high proportion of this demolition and site clearance material is expected to be suitable for reuse and recycling on site. This includes: reinforcement and structural steel work; masonry and brickwork; reinforced concrete and concrete; aggregate sub base; and bituminous pavement material. Where necessary these materials would be suitably processed to meet specification requirements.

13.5.8 The volumes of non-hazardous waste from demolition works are considered to be relatively low in comparison to the regional capacity. It is expected that a high proportion of the material generated will be recyclable and not go to landfill. The magnitude of the Non Hazardous / inert waste is considered to be negligible.

13.5.9 It is likely that the demolition will generate some asbestos hazardous waste. Asbestos will need to be surveyed prior to the commencement of demolition works so that all asbestos material can be separated and managed appropriately. The quantities are expected to be very low in comparison to the national capacity. The magnitude of the hazardous waste is considered to be negligible.

Earthworks

13.5.10 Some, such as excavated soils, will originate on the Main Site. The Proposed Development will seek to utilise as much soil sourced from within the Main Site as possible so as to achieve a cut and fill balance. This will depend on the scheduling and timing of the construction of each scheme and the nature of the materials available and whether legacy contamination is found.

13.5.11 The design is still being finalised for the earthworks estimations and will be updated and made available prior to submission in the final ES.

Construction Waste

13.5.12 In terms of waste, potential environmental impacts are primarily related to the production, movement, transport, processing and disposal of waste from the construction of the Proposed Development.

13.5.13 The potential construction impacts on waste included in the assessment, as identified in DMRB LA 110, are:

- The reduction in regional landfill capacity; and
- The reduction in national landfill capacity.

13.5.14 Most of the material resources required for construction of the Proposed Development, such as metals, aggregate, pavement, concrete and soils, will originate offsite purchased as construction products.

13.5.15 Engineering specifications and a Material Management Plan (MMP) (proposed to be included in the final ES Chapter), will outline the suitability of material for re-use onsite and offsite in respect to structural and contamination status prior to submission.

13.5.16 Potential impacts could include the temporary use of waste management facilities capacity (during treatment) and a permanent decrease in landfill capacity (disposal). Landfill is a finite resource and the ongoing disposal of waste puts pressure on the existing facilities or requires new sites to be developed. Similarly, waste management and waste treatment facilities have limits on processing capacity, therefore there is the potential for the Proposed Development to utilise a proportion of the remaining available capacity temporarily for the duration of construction.

13.5.17 Material assets used during construction of the Proposed Development in the Study Area will include primary raw materials, such as aggregates and minerals, and manufactured construction products which include recycled and secondary aggregates. The term 'aggregate' is an umbrella descriptor for bulk raw materials used in large development and infrastructure construction projects. These materials can be further defined as primary, secondary or recycled aggregate as follows:

- Primary aggregate - is the term used for aggregate produced from naturally occurring mineral deposits which are used for the first time;
- Secondary aggregates - as defined by the Waste and Resources Action Programme (WRAP) *Aggregain Programme* (Waste and Resources Action Programme, 2008)[18] - are derived from a very wide range of materials that may be used as aggregates; and
- Recycled aggregates - as defined by Aggregain - can be sourced from a variety of materials arising from construction and demolition (concrete, bricks, and tiles), highway maintenance (asphalt planings), excavation and utility operations.

13.5.18 Waste produced from the construction of buildings (including the Rail Terminal) within the Proposed Development has been assessed. These preliminary figures have been calculated using Smart Waste BRE Waste Benchmark Data[25] and assumes the buildings to be constructed are industrial buildings, producing an average quantity of 12.6 tonnes of construction waste per 100 m^2.

13.5.19 Waste is generated as a result of off-cuts, surplus materials, damaged products, packaging, welfare faculties and general food wastes. Based on a total floorspace of 603,850 m^2, it is therefore anticipated that the construction of the Proposed Development will result in approximately 76,000 tonnes of waste. This data provides an estimate of waste produced during the construction phase only and does not include demolition, excavation, or groundworks waste.

[25] Smart Waste BRE Waste Benchmark Data (2012)

13.5.20 Waste produced from the construction of roads and paved areas within the Main Site (including hardstanding for the Rail Terminal) will be calculated in the ES.

Construction Material

13.5.21 Aside from the earthwork operations the Proposed Development would require the use of a range of other construction materials. These include: road paving, concrete, precast concrete, steel, plastics and timber.

13.5.22 Aside from the earthwork operations the Proposed Development would require the use of a range of other construction materials. These include: road paving, concrete, precast concrete, steel, plastics and timber.

13.5.23 The exact source of materials required for the construction of the Proposed Development cannot be defined at this stage. However, materials for construction would be sourced locally where practicable by the contractor.

13.5.24 Although the source of concrete and road surface cannot be defined at the moment a significant quantity of minerals are expected to be required for use as a sub-base, production of concrete, and road surfaces.

13.5.25 At a strategic level, the key waste types generated from the construction of the Proposed Development can be classified as follows:

- INERT – wastes that will not cause adverse effects to the environment when disposed of, or do not decompose and they have no potentially hazardous content when deposited in a landfill. Examples of inert wastes are rocks, concrete, mortar, glass, uncontaminated soils and aggregates;
- NON-HAZARDOUS – wastes that will decompose when buried resulting in the production of methane and carbon dioxide. Examples of non-hazardous wastes include timber, paper and cardboard; and
- HAZARDOUS – wastes that are harmful to human health of the environment (for example, causing pollution of watercourses) if they are incorrectly handled, stored, treated or disposed of. Hazardous wastes may have one or more of the following properties: explosive, corrosive, flammable, highly flammable, infectious, oxidising or sensitising.

13.5.26 Table 13.19 contains the general List of Waste Categories (also known as the waste classification codes) and types typically found on construction sites of this nature. The list has been taken from the 'Guidance on the classification and assessment of waste (1st Edition v1.1). Technical Guidance WM3' (Environment Agency et al. 2018). During the construction phase, the relevant waste code would be provided on each waste transfer note that would accompany every movement of waste from the site.

Table 13.19: General Waste Categories

Waste Code	Waste Stream
17 01	**Concrete, bricks, tiles and ceramics**
17 01 01	Concrete
17 01 02	Bricks
17 01 03	Tiles and ceramics
17 01 06*	Mixtures of, or separate fractions of concrete, bricks tiles and ceramics containing dangerous substances,
17 01 07	Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics
17 02	**Wood, glass and plastic**
17 02 01	Wood
17 02 02	Glass
17 02 03	Plastic
17 02 04*	Glass, plastic and wood containing or contaminated with dangerous substance
17 03	**Bituminous mixtures, coal tar and tarred products**
17 03 01*	Bituminous mixtures containing coal tar
17 03 02	Bituminous mixtures other than those mentioned in 17.03 01
17 03 03*	Coal tar and tarred products
17 04	**Metals (including their alloys)**
17 04 01	Copper, bronze, brass
17 04 02	Aluminium
17 04 03	Lead
17 04 04	Zinc
17 04 05	Iron and steel
17 04 06	Tin
17 04 07	Mixed metals
17 04 09*	Metal waste contaminated with dangerous substances
17 04 10*	Cables containing oil, coal tar and other dangerous substances
17 04 11	Cables other than those mentioned in 17 04 10
17 05	Soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 03*	Soil and stones containing dangerous substances
17 05 04	Soil and stones other than those mentioned in 17 05 03
17 05 05*	Dredging spoil containing dangerous substances
17 05 06	Dredging spoil other than those mentioned in 17 05 05
17 05 07*	Track ballast containing dangerous substances
17 01	**Concrete, bricks, tiles and ceramics**
17 05 08	Track ballast other than those mentioned in 17 05 07
17 06	**Insulation materials and asbestos-containing construction materials**
17 06 01*	Insulation materials containing asbestos
17 06 03*	Other insulation materials consisting of or containing dangerous substances
17 06 04	Insultation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05*	Construction materials containing asbestos
17 08	**Gypsum-based construction materials**

17 08 01*	Gypsum-based construction materials contaminated with dangerous substances
17 08 02	Gypsum-based construction materials other than those mentioned in 17 08 01
17 09	**Other construction and demolition wastes**
17 09 01*	Construction and demolition wastes containing mercury
17 09 02*	Construction and demolition wastes containing PCB (for example, PCB-containing sealants, PCB-containing resin-based floorings, PCB-containing sealed glazing units, PCB-containing capacitors)
17 09 03*	Other construction and demolition wastes (including mixed-wastes) containing dangerous substances
17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03

13.5.27 For the benefit of this study some broad estimates have been made based on an allowance of an average of 0.8m thickness of aggregate in all forms of engineering fill, aggregate component of concrete and road paving. Concrete will be used for slabs within buildings and also for foundations.

13.5.28 A review of the available quarries has been undertaken and five quarries have been identified in close proximity to the Main Site. All five are within 30 km of the Main Site. Mineral capacity data is not readily available as it is commercially sensitive information to operators and therefore not forthcoming. It is considered that given the number of quarries in close proximity to the Main Site that there is a substantial quantity of quarried material available to this Site.

13.5.29 Given the Applications Sites proximity to identified reserves of construction materials and expected construction wastes types and volumes, the magnitude of impacts for materials for aggregate extraction is expected to be minor at this stage.

Storage of Materials

13.5.30 Measures to control the management and temporary storage of materials and waste during construction will be detailed within the Construction Environmental Management Plan (CEMP) contained in [Ref in due course] and are therefore not covered in this assessment.

13.5.31 Waste will be separated at source where practical, with storage areas laid out to facilitate the segregation of waste material to encourage reuse and recycling; for example, by using colour coded skips. Signage will be used to clearly identify the material to be stored in each area and the site set up will be continuously reviewed and modified where necessary to maximise the opportunity for reuse and recycling.

13.5.32 Temporary storage areas will be provided with the capacity to store excavated material required for reuse onsite. Best practice guidance recommends that topsoil should not be stored at heights greater than 3m[26].

Transportation of waste

13.5.33 The movement of waste will be undertaken by road. The extent of the impacts will be proportional to the waste generated and any reduction in waste will reduce the impacts on the road network. During construction works the reuse of material onsite will reduce waste movements. The impact on air quality, noise, and traffic is assessed elsewhere in the ES. Any betterment in the reduction of waste generated will automatically reduce the transportation impact.

Construction Impacts

13.5.34 The potential waste types that could arise during the construction phase are summarised in **Table 13.20**: Potential waste sources during the construction phase.

Table 13.20: Types of waste arisings generated by construction of the Proposed Development

Phase	Potential Waste Generation	Classification of Waste	Potential Impacts / Management
Demolition	Building materials, such as concrete, bricks, plastics, metals, plasterboard, timber, paint, etc. Made ground, soil and sub-soils Asphalt and bituminous products.	Inert; and/or, Non-hazardous; and/or, Hazardous. Non-hazardous, and Hazardous if it contains sufficiently high levels of heavy metals or if asphalt contains coal tar.	The reduction in national landfill capacity.
	Existing infrastructure such as farmhouse and road demolition including supports, rails, voids.		Some material may be suitable for re-use or recycled onsite. Local recycling facilities. Disposal at an inert / non-hazardous or hazardous landfill site.
Excavation	Made ground, soil and sub-soils.	Inert; and/or, Non- hazardous; and/or, potentially Hazardous if it contains sufficiently high levels of heavy metals.	The reduction in regional inert, non- hazardous and hazardous landfill capacity.
Site preparation and earthworks	Vegetation strip and tree removal. Existing highways infrastructure such as kerbs, lighting, highways signs, safety barriers, etc.	Earthworks quantities will be available in the final ES.	Re-use onsite. Recycling offsite in local projects. Local recycling facilities. Disposal at an inert / non-hazardous or hazardous landfill site.

[26] Defra, 2009. Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Available online at: Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (publishing.service.gov.uk)

Phase	Potential Waste Generation	Classification of Waste	Potential Impacts / Management
Construction	Construction materials, such as concrete, bricks, plastics, metals, plasterboard, timber, paint, etc.	Inert; and/or, Non-hazardous; and/or, Hazardous.	The reduction in regional inert, non- hazardous and hazardous landfill capacity.
	Made ground, soil and sub-soils.	Non-hazardous, and Hazardous if it contains sufficiently high levels of heavy metals.	The reduction in national landfill capacity.
	Waste products arising from the presence of construction staff onsite e.g. effluent from portable toilets, food waste and packaging, as well as waste from surplus materials and spillages.	Inert; Non- hazardous and potentially Hazardous.	The reduction in regional non- hazardous and hazardous landfill capacity.
	Surface planings.		Some material may be suitable for re-use or recycled onsite. Local recycling facilities. Disposal at an inert or non-hazardous site.
	Site won material (hazardous).		Any hazardous material will be taken to a permitted waste management facility.

13.5.35 An anticipated preliminary assessment of operational impacts in terms of waste is presented in **Table 13.21**. An updated version of the table will be presented in the final ES.

Table 13.21: Preliminary assessment of the construction impacts

Project Activity	Activities with Potential impacts on material resource / waste	Sensitivity of Receptor	Description of Magnitude	Significance
Demolition	Disposal of demolition waste	Very High	Minor	Slight
Demolition	Disposal of asbestos from demolition works	Very High	Minor	Slight
Site preparation earthworks	Excavation and filling using site won materials, disposal of unsuitable material	Very High	Minor	Slight
Construction	Use of quarried aggregate for construction (Concrete, sub base, road surfacing)	Medium	Minor	Slight
Construction	Construction waste	Medium	Negligible	Neutral

Operational Phase

13.5.36 An assessment of the likely waste impact during the operation of the Proposed Development is based on the typical weekly waste arisings quantities from BS5906:2005[27]. This British Standard has typical quantities for a wide range of building types and this proposed use best fits with the industrial weekly arising of five litres per m^2 of floor area. Based on the assumed floor total area of 603,850m^2, this equates to approximately 3,019m^3 of waste generated per week, or an annual waste arisings of 156,988m^3 / 32,967 tonnes per annum of waste generated (using the WRAP conversion of 0.21 tonnes per m3 for municipal waste). At this prelimary stage it is anticipated that 32,967 tonnes per annum (tpa) is above the expected figure for the proposed logistics park. It is estimated that the recycling rates will be up to 65% which would amount to around 1% of the annual landfill capacity for the Study Area. The magnitude of the operational waste is therefore assessed at this preliminary stage as negligible. This assessment will be reviewed and updated in the final ES.

13.5.37 The Rail Terminal is not expected to generate waste through its operation or maintenance. The replacement of rails on sidings will occur at a frequency greater than 50 years and it is assumed that rails are recycled and ballast is cleaned and reused.

13.5.38 The decommissioning of the new structures/buildings has not been assessed as the structures are all permanent structures.

13.5.39 An assessment of operational impacts in terms of waste will be presented in the final ES Chapter.

13.6 MITIGATION AND RESIDUAL EFFECTS

Construction

13.6.1 The design of the Proposed Development is ongoing along with the development of mitigation measures relating to material assets and waste. However, at this preliminary stage, initial measures have been developed using a series of principles to drive the mitigation of materials use and waste generation, treatment and disposal. The measures required to implement good practice and sustainable resource and waste management will be developed further through the final preparation of the ES and will be secured within the CEMP and a MMP, which will both be submitted as part of the final ES.

[27] British Standards Institute (2005) 'Waste Management in Buildings – Code of Practice' Available from: https://shop.bsigroup.com/products/waste-management-in-buildings-code-of-practice/standard

13.6.2 There is significant synergy between materials re-use and the avoidance of the generation of waste, and therefore there is a substantial overlap between the mitigation measures for materials and waste.

13.6.3 The importance of careful management of materials to promote re-use and waste reduction has been widely recognised by the construction industry. Both legislation and voluntary best practice mechanisms have been developed and implemented. These provide measurable and accountable processes and provide the basis for mitigating environmental effects associated with materials and waste.

13.6.4 The principal mitigation measure relating to the earthworks will be the development and implementation of a MMP. A MMP would allow for material to be reused on site without the material being classed as a waste and will also allow for imported material to come from donor sites as material for reuse.

Operation

13.6.5 During Operations, although not required by the regulations, a SWMP will be developed and regularly updated during the lifetime of the Proposed Development. The SWMP will identify:

- The types and likely quantities of construction, demolition and excavation (CD&E) wastes that may be generated as a result of the proposed development;
- Relevant reuse, recycling and landfill diversion targets applicable to the proposed development; and
- A review of the waste management measures and procedures to be implemented on site during construction in line with relevant legislation, guidance and best practice. These measures would set out how the CD&E wastes would be reduced, reused, managed and disposed of.

Setting Targets to Divert Waste from Landfill

13.6.6 Targets for diverting demolition materials from landfill and construction waste from landfill targets will be included in the SWMP. These targets will be in line with the good practice targets set in the Building Research Establishment Environmental Assessment Methodology BREEAM New Construction Manual (BRE Global Ltd, 2018). The targets are anticipated to exceed the target set by the Waste (England and Wales) Regulations 2011 (as amended), which requires that a minimum of 70% of construction and demolition waste should be prepared for reuse, recycling or other material recovery.

13.6.7 Where applicable, further targets would be set during the detailed design stage to reduce, reuse or recycle key waste materials on and off site. The targets will be incorporated into the contract specifications with contractors post consent.

Minimisation

13.6.8 The design of the new buildings and structures will take into account the relevant best practice guidance. This could include industry body 'The Waste and Resources Action Programme' (WRAP) which ensures design reduces the amount of waste produced by:

- *"Designing for reuse and recovery";*
- *"Designing for off site construction";*
- *"Designing for materials optimisation";*
- *"Designing for waste efficient procurement"; and*
- *"Designing for deconstruction and flexibility"*

13.6.9 The majority of opportunities to minimise the amount of waste generated by a development occur during the design stage. At this preliminary stage the following design measures will be considered where practicable:

- Using pre-fabricated materials for on-site assembly;
- Buildings/structures designed to standard dimensions of blocks or frames to avoid off-cuts; and
- Internal materials and fittings would be pre-cut to reduce the need for site cutting.

13.6.10 The design of the Proposed Development aims to retain spoil on site, where practicable. A MMP would be prepared to document the management of excavated material on the site and provide the evidence needed to avoid this material being deemed to be a waste.

13.6.11 Decisions taken to minimise waste through the design process will be documented in the SWMP submitted as an appendix to this chapter when the ES is finalised.

13.6.12 Waste would also be minimised by improving wastage rates when ordering materials. Waste allowances are generally included within material orders to take into account design waste and construction process waste. These waste allowances are often generic and not project specific and, therefore, run the risk of being inaccurate. This can lead to a surplus of materials, which typically ends up being discarded (i.e., waste). A system will be put in place to enable the accurate estimates of material requirements (and waste allowances) at the detailed design stage.

13.6.13 On appointment of the construction team, the buyer would discuss the purchasing requirements with the site manager to identify priorities and review the quotations received. Materials would be checked against the material specifications as part of the quality control system. Where possible, hazardous materials would be substituted for less hazardous alternatives.

13.6.14 Waste minimisation measures would be implemented by the principal contractor and site manager during construction in order to achieve the waste allowance targets. At this preliminary stage the following measures will be considered:

- A logistics system which allows 'just-in-time' deliveries to minimise the length of time materials are stored on site and co-ordinate with other trades;
- Providing suitable and secure storage for materials where 'just-in-time' deliveries cannot be set up;
- Mechanical systems and machinery would be considered for moving materials to reduce the risk of damage; and
- Programming and monitoring construction activities to avoid overlap of incompatible trades working in the same area and to reduce the potential for waste to be generated from replacing damaged work.

13.6.15 The target for construction waste resource efficiency for new buildings is ≤11.1 tonnes of waste generated per 100 m2 (gross internal floor area) and is in line with BREEAM New Construction Manual (BRE Global Ltd, 2018).

Preparing for Reuse

13.6.16 The approach to earthworks (at this preliminary stage) will enable materials excavated onsite to be re-used at areas of the site where materials are required, as far as practicable. The approach to earthworks will be influenced by the construction phasing and there may be limitations on how materials can be re-used between the different phases. The approach to earthworks will be set out in this chapter when finalised.

13.6.17 The Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste Code of Practice (Contaminated Land: Applications in Real Environments, 2011)[28] would be applied to optimise the amount of excavated materials that can be re-used and recycled across the Proposed Development. The requirement to comply with the CL:AIRE Definition of Waste Code of Practice will be set out in the CEMP which will be included in the final ES.

13.6.18 A pre-demolition audit would be undertaken for all buildings and structures to be demolished to identify the type, location and condition of hazardous materials. A similar record of all salvageable and recyclable materials will also be prepared.

13.6.19 Prior to demolition, any hazardous waste will be removed from the buildings and the fittings etc. would be stripped out and sorted for salvage/recycling. All movements of waste from the site will be recorded using the SWMP.

[28] Contaminated Land: Applications in Real Environments (2011) The Definition of Waste: Development Industry Code of Practice

13.6.20 Materials from the demolition of buildings and structures on site will be stockpiled to allow pre-treatment for reuse on or off- site, or they will be removed off-site for recycling or disposal.

Recycling

13.6.21 Wastes generated during the construction process will be segregated into waste types to facilitate off-site recycling (for example, metals, wood, plastic). The layout of the construction site would be designed to allow sufficient space for separate containers of key waste materials to be stored. These containers will be clearly labelled and construction staff would be given training on waste segregation.

13.6.22 Concrete from the redundant areas of hardstanding, including the redundant strip of road will be excavated to an agreed depth and crushed on site for re-use in the construction process.

13.6.23 It is expected that green waste generated during site preparation works will be composted on-site at the STGP facility. Depending on phasing, it is presumed the existing or proposed facilities would be utilised. Opportunities will be investigated to retain woody material on site for landscaping and ecological planting.

13.6.24 The principal contractor would consider the use of recycled materials where possible, subject to cost and availability (for example, recycled aggregate and secondary aggregates for use in concrete, or granular fill).

Disposal

13.6.25 Any waste that cannot be reused, recycled or recovered will be collected by the licensed waste management contractor and disposed of at a permitted site suitable for the type of waste. Burning of surplus material or material arising from the site construction will not be permitted.

Storage of Waste

13.6.26 Waste storage areas will be provided at the at the construction site. Each skip/container will be clearly marked to indicate the intended contents and would be suitable for the storage of the specified contents. All skips/containers will be covered to prevent the escape of waste by wind blow or vandalism. If liquid waste is being stored, an appropriate bund and drip pans will be in place.

13.6.27 Storage areas would be located away from potential contaminant pathways such as drains, and excavations and trenches. Any hazardous waste would be stored safely in a designated area away from non-hazardous and inert wastes and labelled accordingly.

Mineral Assets

13.6.28 The depletion of finite material resources will occur through extraction of primary aggregates (e.g. sands and gravels). Structures, drainage and signage products will be procured with consideration of the environmental impacts associated with their manufacture, as well as other considerations such as structural design, carbon footprint (PAS 2050), energy consumption, long-life performance, visual impacts, durability and cost. The procurement of sustainable materials will be secured through the CEMP.

13.6.29 With the growing demand for construction products and the ever -increasing pressure to reduce the environmental impacts of depleting natural resources, there is a significant percentage of construction materials that are produced from recycled material. Further details about the recycled content target for the Proposed Development from the likes of aggregates, concrete and steel, will be set out in the final ES.

13.6.30 Site levels and grading of the Proposed Development will be designed to achieve a cut and fill balance in order to help minimise excavation quantities.

13.6.31 The Environment Agency Quality protocols (Environment Agency, 2020d)[29] will be used to identify when a waste-derived material can be regarded as a non-waste product and no longer subject to waste controls. The Quality protocols could potentially be applied to optimise the amount of demolition materials that can be re-used across the Proposed Development, and the requirement to comply with these protocols will be set out in the CEMP in the final ES.

Residual Environmental Effects

13.6.32 Receptors which were assessed with potential to be significantly impacted during the construction phase have been reassessed, at this preliminary stage, with the anticipated mitigation measures detailed above in place. Careful management of material from the earthworks can avoid material that is not suitable to be reused onsite being sent to landfill. Material designated for an alternative use such as surplus topsoil can be sent to donor sites without classifying the material as waste, though it is not expected as a cut and fill balance will be achieved. In addition, material treated or processed and then reused onsite will reduce what is required for disposal. It is reasonable to assume, that if the material unsuitable for reuse cannot be used onsite then as part of the mitigation in the CEMP the material is more likely to be managed by a material recycling facilities than sent to landfill. A small proportion of any

[29] Environment Agency (2020d) Quality protocols: converting waste into non-waste products, available at: https://www.gov.uk/government/collections/quality-protocols-end-of-waste-frameworks-for-waste-derived-products

earthwork material sent to a waste transfer station will get sent to landfill reducing the impact to a negligible significance.

13.7 CUMULATIVE AND IN-COMBINATION EFFECTS

13.7.1 There is the potential for additional impacts with regards to material use and waste disposal when the Proposed Development is considered alongside other committed developments within the local vicinity. At this preliminary stage, there is uncertainty regarding the operation and maintenance activities required for the Proposed Development. As such, details of the materials required and the wastes for these activities will be incorporated into the final ES assessment as further information becomes available.

13.7.2 In the absence of detailed cumulative assessment at this stage, it is assumed that all consented schemes within the study area will be required to meet the requirements of relevant legislation and local policies. This will include adherence to the waste hierarchy and a target of at least 70% recovery of wastes generated (as per the Waste Framework Directive) with a view to achieve 2035 targets. As such it is assumed that waste arisings from the Proposed Development will be segregated and sent for composting, recycling or for further segregation and sorting at both the existing and proposed onsite Severn Trent Green Power IVC facility.

13.7.3 A quantitative assessment will enable a calculation to be completed to understand the likely volumes of waste being produced for both the Proposed Development, and the relevant committed developments, within a specific timeframe. This could then be applied to waste facilities within the local area, and using their estimated capacities a quantitative assessment could be completed to understand if there would be a significant cumulative impact on the capacity of relevant waste facilities. However, given the information available for both the Proposed Development itself, and the committed developments being considered in this cumulative section, a quantitative assessment is not possible. This is due to the stage of works for the Proposed Development in combination with little relevant information being available for the committed developments.

13.8 SUMMARY AND CONCLUSIONS

13.8.1 As a nationally significant infrastructure project there is a significant quantity of earthworks required to develop a level development platform with connections to the highway and rail infrastructure. A large volume of material is expected to be required to create a platform for the proposed units and surrounding infrastructure. The design of the earthworks will be optimised to balance requirements of excavation and infill, this will maximise the quantity of material reused onsite and minimises the material disposed off-site.

13.8.2 Prior to any predicted waste composition and volumes being feasibly calculable, it has not yet been possible to accurately establish the potential effects resulting from waste generation. As this becomes available the assessment will be carried out in line with the methodology outlined in this chapter to assess against the reduction in the regional landfill void capacity.

13.8.3 Once data becomes available, continued assessment work will be undertaken, in line with the approach set out above, to identify the potential effects on Material Assets and the effects relating to waste on the Proposed Development. At the time of drafting this chapter, no specific design measures relating to material use or waste generation are available. A Construction Environmental Management Plan (CEMP) will include specific instruction on steps to be taken to manage and dispose of the varied waste that is anticipated to occur during the construction phase. A Materials Management Plan (MMP) will also ensure that any adverse effects associated with material assets are responsibly managed. This will minimise material classified as waste and outline an approach which will maximise the potential to recover material and ultimately prevent the material from being disposed of in landfill.

13.8.4 It is inevitable that there will be a requirement to import material particularly where large quantities of engineering graded material are required and for the production of concrete. Reuse and recycling material will minimise the volume of material imported; the Main Site is well served with a number of quarries in the near vicinity. The importation of material is not expected to have a significant impact on the supply of aggregates with the impact assessed as slight adverse.

13.8.5 The Proposed Development will have in place a Site Waste Management Plan (SWMP) as a key document with which to measure and report on construction operations as they occur. It will include specific instruction on steps to be taken to manage and dispose of the varied waste that is anticipated to occur operations in line with the Waste heirachy. Other than green waste, waste generated by the Proposed Development which cannot be reused will have to be taken off-site. The Main Site benefits from a range of waste facilities in close proximity. With adherence to a SWMP, the associated reuse of material the quantity of waste would not have a significant impact on the capacity of the landfill sites in the region with the impact assessed as slight adverse.

13.8.6 A new suitable facility is proposed for the relocation of the Severn Trent Green Power IVC facility is as close to the former site as possible to minimise the impacts of transportation, in particular the release of carbon emissions. Agreement on mitigation measures, both embedded and additional will be sought through consultation with relevant consultees and will be reported within the final ES.