East Midlands Gateway
Phase 2 (EMG2)

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ENVIRONMENTAL STATEMENT

Volume 1 Main Statement

Chapter 18

Materials and Waste

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18

The East Midlands Gateway Phase 2 and Highway Order 202X and The East Midlands Gateway Rail Freight and Highway (Amendment) Order 202X

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18. Materials and Waste

18.1. Introduction

18.1.1. This ES Chapter reports the assessment of any potential significant effects of the **Scheme** on materials consumption, waste generation and disposal, during construction and operation. It describes the:

- relevant policy, legislation and guidance;
- consultation undertaken to date;
- methodology for assessment;
- potential impacts and effects of the construction phase; and
- potential impacts and effects of the operation phase.

18.1.2. The materials and waste assessment of the **Scheme** has been undertaken in line with the legislation, policy and guidance described in Section 18.3 of this chapter.

18.2. Scope and Methodology of the Assessment

18.2.1. The scope of this Chapter includes the assessment of the materials consumption and waste generation and disposal for the component parts of the **Scheme** that are detailed within **Chapter 3.**

18.2.2. This ES Chapter has been undertaken in compliance with the Planning Inspectorate's EIA adopted 'Scoping Opinion' (**Appendix 1b**). As part of the assessment of effects, this Chapter considers the Scoping Opinion received by PINS in relation to comments received regarding materials and waste as below (Scoping Opinion ID 2.2.11):

- *an approximate estimate of materials used in the construction of the Proposed Development, based on worst-case parameters;*
- *the type, volume and sources of materials required;*
- *the volumes and nature of wastes generated; and*
- *the likely generation of traffic as a result of any movements of materials or waste*.

18.2.3. The following effects are considered unlikely to be significant, and therefore have not been considered further in this assessment (Scoping Opinion ID 3.0.3):

- *impacts associated with the extraction of raw resources and the manufacture of products*.

18.2.4. The impacts from the transportation of material resources and waste to and from the **Scheme** are assessed in **Chapters 6**: **Traffic and Transport** and **19: Climate Change** respectively.

18.2.5. Impacts on human health and controlled waters as a result of contaminated site arisings from the **Scheme** are assessed in **Chapters 13: Flood Risk and Drainage, 14: Ground Conditions, 15: Agriculture and Soils and 17**: **Population and Human Health** respectively.

18.2.6. The assessment of the construction phase effects and has been prepared in accordance with the IEMA guide to 'Materials and Waste in Environmental Impact Assessment'[i], the 'CL:AIRE Definition of Waste: Development Industry Code of Practice' and the 'Design Manual for Roads and Bridges (DMRB) LA110 for Material Assets and Waste'[ii].

Baseline Data Collection

18.2.7. The most up-to-date sources of information, available at the time of writing, have been used to collate data for material resource availability, landfill capacity and waste recovery.

18.2.8. The key sources of information used to determine the baseline resource availability, landfill capacity and waste recovery conditions are:

- Department for Business and Trade Monthly 'Bulletin of Building Materials and Components'[iii];
- Natural England Multi-Agency Geographic Information for the Countryside ('MAGIC') mapping[iv];
- Department for Environment, Food & Rural Affairs ('DEFRA') (2024) 'UK Statistics on Waste'[v];
- Environment Agency ('EA') (2023): Waste Data Interrogator[vi]; and
- EA 'Remaining Landfill Capacity, England' (2024)[vii].

Study Area

18.2.9. The study areas for the assessment of impacts related to materials and waste have been defined in line with the IEMA Guidance[i].

18.2.10. Two study areas are defined. Together the '**Scheme** Study Area' and 'Expansive Study Area' are referred to in this chapter as 'the Study Areas':

i. The **development study area** - comprises the **Scheme** (as set out within **Chapters 1** and **3** and shown on the Order Limits Plans Documents 2.1 and MCO 2.1. These plans are provided with this ES as **Figures [xx and xx].** It also includes and any areas required for temporary access, site compounds, working platforms and other enabling activities. The development study area comprises waste generated through both construction and operation, namely, groundworks, construction materials and bi-products of operations.

ii. The **expansive study area** – extends to the availability of construction materials, and capacity of waste management infrastructure and remaining landfill void, within a defined region. For the purposes of this assessment, the region extends to a radius of 30 miles from the centre of the **Scheme**, which was agreed during consultation with Leicestershire County Council (LCC).

18.2.11. Recognising that there is no defined radius for waste-related matters in current best UK practice guidance, a 30-mile radius from the **Scheme** has been proposed (**Appendix 18[x]**). This approach aligns with best practice guidance for materials management, which recommends a similar scale for assessing material sourcing and waste considerations:

- WRAP (Waste and Resources Action Programme): WRAP guidance often suggests considering local sourcing and waste management within a practical range, typically up to 30 miles, to minimise transport emissions and maximise local resource use.
- CIRIA (Construction Industry Research and Information Association): Some CIRIA guides on materials and waste management discuss sustainable procurement and logistics within similar distances to reduce environmental impact.
- BS 8903: Principles and Framework for Sustainable Procurement: While not specific to a 30-mile radius, it promotes local sourcing as a key strategy, often referencing radii that align with practical transport considerations.
- DEFRA's Waste Management Plan for England: This document supports a proximity principle for waste management, which can sometimes inform practical distances such as the 30-mile guideline.

18.2.12. This proposed radius is subject to agreement with LCC and neighbouring / transboundary authorities.

18.2.13. [This section to be completed on receipt of data from and further consultation with LCC].

Assessment of Construction Effects

18.2.14. The IEMA Guidance has been used to assess the potential construction effects from the **Scheme**, using the process and significance criteria it sets out. Method W1 (Void Capacity, as detailed in the IEMA Guide) has been used to best reflect the scale and nature of the **Scheme**.

18.2.15. In accordance with the IEMA Guidance, the assessment is a quantitative exercise that identifies the:

- type and volume of materials to be consumed by the **Scheme** during construction, including details of any recycled materials content;
- type and volume of waste to be generated by the **Scheme** during construction, with details of planned recovery and/or disposal method (for example onsite reuse, offsite recycling, disposal to landfill);
- cut and fill balance, during construction; and
- details of any construction materials to be specified, where sustainability credentials (particularly those that improve resource efficiency) afford performance beyond expected industry standards.

Assessment of Operational Effects

18.2.16. The CL:AIRE Definition of Waste is a regulatory construct to determine when an item, substance or material becomes waste that is currently defined under Section 75 of the Environmental Protection Act 1990[1].

18.2.17. The approach to assessing the effects of waste generated by the **Scheme** during its operational life broadly aligns with the methodology adopted for the assessment of construction phase wastes. However, rather than the assessment solely relating to the ability of landfill infrastructure to accept any generated wastes, the assessment also considers other recovery and disposal options for the more specialist types of waste to come from the operation phase of the **Scheme**. This is because unlike the construction phase, where associated waste, if not recycled, usually results in landfill, (e.g. surplus building materials) the types of waste to be generated during the operational phase such as oils, lubricants, electricals and batteries are more likely to require alternative forms of treatment at specialist facilities.

18.2.18. The operation phase assessment includes:

- expected waste (likely types and estimated quantities) to arise in a typical year of operation;
- changes to annual waste volumes from improvements or changes to operations e.g. replacement technologies, alterations in capacity of the facility etc.; and
- changes to annual waste volumes from potential sustainability and waste reduction targets that could impact upon the composition, tonnage and management route for wastes (including internal targets or regulatory targets).

18.2.19. The operational waste arisings do not include end of life wastes such as the decommissioning of the **Scheme**. The **Scheme** has a long design life and potentially even longer operational life and as such it is not considered possible to reliably forecast decommissioning requirements and infrastructure far in the future.

Determining Volumes of Waste

18.2.20. Estimates of the likely waste generation from the operations buildings are based upon floor area and appropriate benchmark metrics from BS 5906:2005 Waste Management in Buildings – Code of Practice.

18.2.21. Potential wastes are quantified using metrics appropriate to the building use, with estimates generated on a building split of 80% 'Warehousing/Industrial Unit' (B8/B2 Uses) and 20% ancillary 'Offices' (Use Class E) including maintenance storage:

- To quantify estimated potential industrial wastes, a metric of 5 litres is applied to every square metres of floorspace across operational areas.
- To quantify estimated potential office wastes, a metric of 50 litres is applied each per square metres of floorspace across operational areas.

[1] Environmental Protection Act 1990 is up to date with all changes known to be in force on or before 17 November 2024. There are changes that may be brought into force at a future date.

18.2.22. Typical ratios for waste in warehousing are as follows:

- Packaging Waste: Accounts for approximately 60–70% of total waste in non-specialist warehouses.
- General and Operational Waste: Around 20–30%.
- Hazardous and Maintenance Waste: Typically 5–10%, depending on the warehouse's specific operations.

18.2.23. To enable a calculation of weight to benchmark against the capacity of waste receptors, it is necessary to convert typical volumes (litres) to cubic metres and/or tonnes. Converting litres of waste to tonnes depends on the density of the waste material, as the relationship between volume (litres) and weight (tonnes) varies significantly based on the material's composition. Steps to converting litres to tonnes are as follows:

i. Determine the Volume in Litres: Identify the total volume of waste in litres.

ii. Identify the Waste Type: Determine the type of waste (e.g., water, oil, food, plastic).

iii. Find the Density: Use a standard density chart or data provided by the waste producer/handler. Density is typically measured in kilograms per litre (kg/l).

iv. Perform the Conversion: Multiply the volume by the density to calculate the weight in kilograms, then divide by 1,000 to convert to tonnes.

18.2.24. The general formula for conversion is:

$$\text{Weight (tonnes)} = \text{Volume (litres)} \times \text{Density (kg/l)} / 1{,}000$$

18.2.25. Factors influencing density include the composition of the waste (warehouses dealing with high volumes of cardboard and plastic will have lower-density waste compared to facilities handling food products or scrap metal), compaction (using balers and compactors significantly increases density and reduces storage/transportation volume) and moisture content (organic waste, such as food or cleaning residues, increases the average density due to higher water content).

18.2.26. The average density of warehouse waste varies depending on the type of materials being handled, operations within the warehouse, and how the waste is managed (e.g., loose or compacted). However, typical estimates[viii,ix] for the density of mixed warehouse waste are presented in **Table 18.1**.

Table 18.1: Typical Estimates for the Density of Mixed Warehouse Waste

Waste Type	Average Density (kg/l)	Notes
General Mixed Waste (Uncompacted)	0.5-0.3	Includes plastics, cardboard, and general refuse.
General Mixed Waste (Compacted)	0.3-05	After compaction, density increases significantly.
Cardboard Waste	0.05–0.15	Lower density unless baled or compacted.
Plastic Waste	0.10–0.25	Very low density, particularly for loose plastics.
Wooden Pallets	0.30–0.60	Higher density, depending on size and stacking.
Food Waste	0.60–0.80	Organic material with high moisture content.
Hazardous Waste	1.00–1.50	Includes batteries, WEEE, and chemical residues.

18.2.27. Given the amount and type of waste cannot be determined at this stage, the average density for General Mixed Waste is to be applied. The upper value (0.50 kg/l) will be taken as a worst case scenario.

Determining the Significance of Effect

Determining the Sensitivity of Receptors

18.2.28. The sensitivity of waste is determined by considering the baseline and forecast future baseline of regional (Expansive Study Area) landfill void capacity in the absence of the **Scheme**. Landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste.

18.2.29. The sensitivity of materials relates to the regional (Expansive Study Area) availability and type of resources to be consumed by the **Scheme**. The sensitivity of materials is determined by identifying where one or more of the criteria thresholds are met.

18.2.30. The criteria for assessing sensitivity of materials and waste receptors are set out in **Table 18.2**, in accordance with the criteria outlined in the IEMA Guidance.

Table 18.2 Sensitivity Criteria

Sensitivity	Inert Waste Criteria	Materials Criteria
Negligible	...remain unchanged or is expected to increase through a committed change in capacity	…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	...reduce minimally: by <1% as a result of wastes forecast.	…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.
Moderate	...reduce noticeably: by 1-5% as a result of wastes forecast.	…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	...reduce considerably: by 6-10% as a result of wastes forecast.	…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	... 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.	…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.

Determining the Magnitude of Impacts

18.2.31. The magnitude of impact describes the degree of variation from the baseline conditions as a result of the **Scheme**. The IEMA Guidance (IEMA, 2020) for assessing the magnitude of impact from materials comprises a percentage-based approach that determines the influence of

construction materials use on the baseline national demand from the construction of the **Scheme**. The criteria used to assess the magnitude of impact for materials are provided in **Table 18.3**.

Table 18.3 Materials Magnitude Criteria

Sensitivity	Materials Criteria
No Change	...no materials are required.
Negligible	...no individual material type is equal to or greater than 1% by volume of the regional a baseline availability
Minor	...one or more materials is between 1-5% by volume of the regional baseline availability.
Moderate	...one or more materials is between 6-10% by volume of the regional baseline availability
Major	..one or more materials is >10% by volume of the regional baseline availability.

Waste

18.2.32. IEMA stipulates that "*a single and unified method for assessing the magnitude of impact from the generation and disposal of waste is felt to be too restrictive by comparison with the number and variety of development types potentially subject to environmental assessment*". The guidance, therefore, offers two methods and describes their relative merits:

i. Method 'W1' – Void Capacity; and

ii. Method 'W2' – Landfill Diversion.

18.2.33. Methods W1 and W2 should not be combined either in part or fully, as this would cause ambiguity and a lack of clarity in reporting.

18.2.34. Using Method W1, the magnitude of impact from waste is assessed by determining the percentage of the remaining landfill void capacity that will be depleted by waste produced during the construction and/or operation phases of the development. Method W1 will therefore be applied to determine the effect of the waste likely to be recovered and diverted from landfill in accordance with annual targets (e.g. 90% recovery / diversion rate).

18.2.35. Using Method W2, developments are compared to a good practice landfill diversion rate of 90% (as achieved and exceeded by major UK developments). Method W2 will be applied where residual waste will not be diverted form landfill (e.g. 10%). The criteria used to assess the magnitude of impact for waste are provided in **Table 18.4**.

Table 18.4: Waste Magnitude Criteria

Magnitude	Method W1	Method W2
No Change	Zero waste generation and disposal from the development.	…100% landfill diversion.
Negligible	Waste generated by the development will reduce regional landfill void capacity baseline by <1%	…90-99% landfill diversion.
Low	Waste generated by the development will reduce regional landfill void capacity baseline by <1-5%	…60-89% landfill diversion..
Moderate	Waste generated by the development will reduce regional landfill void capacity baseline by <6-10%	…30-59% landfill diversion.
Major	Waste generated by the development will reduce regional landfill void capacity baseline by >10%	…<30% landfill diversion.

Determining the Significance of Effect

18.2.36. The overall significance of effects from materials and waste are determined in accordance with the IEMA Guidance (Section 11), by comparing sensitivity and magnitude within the matrix provided in **Table 18.5**.

18.2.37. Effects that are classified as 'moderate' or greater are considered to be 'significant' in EIA terms.

Table 18.5: IEMA Significance Matrix

		Sensitivity of Receptor				
		Negligible	**Low**	**Medium**	**High**	**Very high**
Magnitude of Impact	**No change**	Negligible	Negligible	Negligible	Negligible	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
	Minor	Minor	Minor	Minor	Moderate*	Moderate*
	Moderate	Minor	Minor	Moderate*	Moderate*	Major*
	Major	Minor	Moderate*	Moderate*	Major*	Major*

* These effects are considered significant for the purposes of the EIA Regulations.

Determining the Duration of Effect

18.2.38. The duration of effect is defined in **Table 18.6**.

Table 18.6: Duration of Effect Definitions

Duration	**Definition**
Short-term	The effects would be of short duration and would not last more than 2-5 years.
Medium-Term	The effects would take 5-15 years to be mitigated.
Long-term	The effects would be reasonably mitigated over a long period of time (15 years or more).

Consultation

18.2.39. The Scoping Opinion was requested from the Planning Inspectorate in August 2024. A response was received on 24 September 2024. For the Scoping Report and associated adopted Scoping Opinion, refer to **Appendix 1a and 1b**.

18.2.40. **Table 18.7** summarises responses with respect to Materials and Waste.

Table 18.7: PINS Adopted Scoping Opinion Relevant Summary

ID	Inspectorate's Comments
2.2.11	*The Scoping Report does not consider the potential for effects on materials and natural resources that may be required for the Proposed Development, nor effects arising from the expected residues or wastes that could be generated.* *The Inspectorate also notes that the Main Site would include earthworks and landscape mounds that could potentially require either re-use or import of materials in their construction.* *The Inspectorate therefore considers that there is potential for significant materials and waste effects from the Proposed Development and that an assessment of this aspect should be included within the ES for all phases of the Proposed Development.* *As part of the assessment of effects, the ES should consider:* • an approximate estimate of materials used in the construction of the Proposed Development, based on worst-case parameters; • the type, volume and sources of materials required • the volumes and nature of wastes generated; and • the likely generation of traffic as a result of any movements of materials or waste. *The approach to the assessment of these matters should be discussed and, where possible, agreed with relevant consultation bodies.* *Appropriate cross reference to relevant other aspect chapters should be provided in the ES, such as to traffic and transport, air quality, and noise and vibration assessments.*

LCC Consultation

18.2.41. An initial meeting with representatives from LCC was held virtually on 9th December 2024. The intention of the meeting was to introduce BWB as the technical team, confirm BWB's intent (i.e. methodology) and discuss data gaps.

18.2.42. During the meeting, BWB made LCC aware of differing scenarios that could be considered when determining the 'expansive study area.' It was explained that there is no definitive methodology for applying this, with each scenario having distinct limitations. Following discussions, LCC indicated their preference for defining the study area as a 30-mile geographical radius extending from the central study location.

18.2.43. In response to this feedback, BWB has refined the expansive study area accordingly. However, it was noted that this approach introduces a transboundary element, necessitating additional consultation with neighbouring councils to ensure a comprehensive assessment.

18.2.44. It was further agreed that BWB would circulate the proposed methodology for LCC's consideration and agreement and that LCC would assist BWB with any data gaps where possible.

18.2.45. [This section to be completed upon completion of consultation].

Limitations and Assumptions

18.2.46. This section outlines the limitations, uncertainties, and assumptions made in undertaking the materials and waste assessment reported in this chapter:

- This assessment has been undertaken as a desk-based study, using the most recent publicly available information which is up to and including 2023 (unless stated otherwise). Updated data which has been published during the preparation of this ES has been included.
- No quantified data was available for materials currently required for maintenance and agriculture at the **EMG2 Main Site**.
- No information on steel production is currently available at a regional level.
- The data to be used on the **EMG2 Main Site** have been estimated using the Maximum Parameters, summarised in **Table 18.8**, provided at the time of writing and have been updated accordingly. Given the current stage of the design proposals, a bill of quantities ('BoQ') is not available and will be subject to change as the design progresses, but the information utilised is considered to be a reasonable worse case assumption.
- The resources that are expected to be consumed and waste that is expected to arise during the operation phase of the **Scheme** have been assessed based on the information provided and the current design. Accurate estimates of likely waste generation volumes during operation of the **Scheme** will, to a significant extent, be dictated by the system processes to be utilised by the **Scheme**.
- Both quarry and landfill operators can claim commercial confidentiality for their data at time of submission; data for sites with a commercial confidentiality agreement in place are therefore unavailable for the baseline presented in this Chapter. However, this is not likely to affect this assessment.
- In line with the IEMA Guide[30], a lifecycle assessment (including embodied carbon and water) of materials will not be part of this assessment process. Embodied carbon has been assessed in **Chapter 19: Climate Change.**
- For the assessment, the landfill capacity has been based on a projection of available capacity data from 2020 projected to 2023 based on the known material received in 2020. Although the bulk of the waste would be sent to landfill during the construction of the development, the construction period will span a number of years and will not fall solely in one year. However, 2027 has been deemed as an appropriate approximation of the availability of capacity as it is expected that 2027 will experience

peak earthworks activity during the construction period. Operational recycling rates have been set at a minimum of 65% recovery, as per Defra's guidance, as a worst-case scenario[x].

Table 18.8: EMG2 Main Site Maximum Parameters Summary [to be completed]

Design Component	Maximum Parameter
• Employment floorspace (GIA)	• 300,000 sq.m
• Internal mezzanine	• 100,000 sq.m
• Development zones	• 6
• External hardstanding / highways	• Approx. 76,000 sq.m
• Earthworks cut and fill volume	• [to be completed]
• Bus terminal (Site Area) (included within Zone 6)	• Approx. 12,000 sq.m
• HGV Parking (Site Area)	• Approx. 19,400 sq.m

18.2.47. The Study Area for the consideration of cumulative effects comprises the Expansive Study Area.

18.2.48. A precautionary approach has been adopted to ensure that any 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, all known proposed developments in the surrounding area that could potentially result in cumulative effects have been considered.

18.3. Policy, Guidance and Legislative Context

18.3.1. The policy, legislation, and guidance relevant to the assessment of materials and waste for the Proposed Development is detailed in **Table 18.9**.

Table 18.9: Relevant Policy, Legislation and Guidance

Legislation, Policy or Guidance	Description
Legislation	
Environment Act 1995, as amended in 2021	The Environment Act 1995 makes provision for targets, plans and policies for improving the natural environment. Sets out clear statutory targets for the protection and regeneration of the natural world in four priority areas, one of which is waste. Part 3 specifically refers to waste and resource efficiency, incorporating: producer responsibility obligations; resource efficiency; managing waste; and waste enforcement and regulation.
The Revised EU Waste Framework Directive 2008/98/EC	Provides a comprehensive foundation for the management of waste across the European Community and gives a common definition of waste. While the UK is no longer a member of the European Union, many of the concepts underpinning the Directive are relevant to the UK's domestic law. Article 3 of the Waste Framework Directive defines waste as "*any substance or object that the holder discards or intends or is required to discard*".
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020	Aims to streamline the legislative system for industrial and waste installations into a single permitting structure for those activities which have the potential to cause harm to human health or the environment.
The Waste Electrical and Electronic Equipment Regulations 2013 (as amended)	Aims to reduce the impact of electrical waste on the environment by encouraging reuse or recycling. Ensures electrical and electronic equipment is recycled in a sustainable way when it reaches end of life.
The Controlled Waste (England and Wales) Regulations 2012 (as amended)22	Classifies waste as household, industrial or commercial waste. It allows local authorities to implement charges for the collection of waste from non-domestic properties.

The Waste (England and Wales) Regulations 2011 (as amended)23	Stipulates the requirement for industry and businesses to implement the waste hierarchy. The Waste (England and Wales) (Amendment) Regulations 2014 amend the 2011 Regulations to clarify that the transfer of controlled waste can be recorded on alternative documentation, such as invoices, instead of waste transfer notes.
The Clean Neighbourhoods and Environment Act 2005	Part 5, Chapter 3 of this Act specifically refers to site waste, where there may be a regulatory requirement to prepare Site Waste Management Plans and to ensure compliance with them.
The Hazardous Waste (England and Wales) Regulations 2005 (as amended)	Introduces measures to control storage, transport and disposal of hazardous waste. The Regulations provide a means to ensure that hazardous waste and any associated risks are appropriately managed.
The Waste Minimisation Act 199826	Enables local planning authorities to take the appropriate steps to reduce and minimise the generation of household, commercial or industrial waste within their area.
The Environmental Protection Act 199027	As of 2008, defines within England, Scotland and Wales the fundamental structure and authority for waste management and control of emissions into the environment. The Act outlines the requirement of the manager of a development to ensure that any excess materials or waste resulting from construction activities are recovered or disposed of without any subsequent adverse effects upon the surrounding environment.
The Control of Pollution (Amendment) Act 1989	The Control of Pollution (Amendment) Act 1989 makes it a criminal offence for a person who is not a registered carrier to transport controlled waste to or from any place in Great Britain. The Act also provides for the seizure and disposal of vehicles used for illegal waste disposal.
Policy	
National Policy Statement for National Networks (NPSNN)	The NPSNN sets out the UK Government's policy for the delivery of nationally significant road and rail networks and how these should be applied, with the following paragraphs of relevance to materials and waste.

	The NPSNN recognises the importance of protecting human health and the environment by reducing waste safely and carefully in accordance with the principles set out in the waste hierarchy, and to maximise resource use by moving towards a more circular economy as per Paragraph 5.70. Paragraph 5.71 states that: *The applicant should demonstrate that they will adhere to the waste hierarchy, preventing and reducing waste produced in the first place and maximising preparation for reuse and recycling for waste that cannot be prevented. Where possible, applicants are encouraged to use existing materials first, then low carbon materials, sustainable sources, and local suppliers. Consideration should be given to circular economy principles wherever practicable, for example by using longer lasting materials efficiently, optimising the use of secondary materials and how the development will be maintained and decommissioned. Applicants should consider and take into account emerging government policy, including Maximising Resources, Minimising Waste, constituting the new Waste Prevention Programme for England and Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites, which provides practical guidance on how to improve appropriate soil reuse on construction sites and reducing the volume that is sent to landfill.*
National Planning Policy Framework (NPPF) 2024	The NPPF sets out the Government's planning policies for England and how these should be applied, with the following paragraphs relating to materials and waste. Paragraph 8 highlights that the purpose of the planning system is to contribute to the achievement of sustainable development through three overarching objectives: economic, social and environmental. The environmental objective requires the planning system to protect and enhance the natural, built and historic environment by "*using natural resources prudently, minimising waste and*

	pollution, and mitigating and adapting to climate change, including moving to a low carbon economy". Paragraphs 222 to 225 outline the sustainable use of minerals, which are *"a finite natural resource and can only be worked where they are found*". Therefore, it is essential that sufficient supply is maintained through various planning policies, including safeguarding mineral resources by defining Mineral Safeguarding Areas and Mineral Consultation Areas. Specific guidance under this framework (Planning Practice Guidance) provides further information in support of the implementation of waste planning policy5.
Waste Management Plan for England 2021	Provides a detailed analysis of the present state of waste management at the national level and considers how the objectives of the Waste Framework Directive will be supported effectively. It outlines the waste hierarchy, which gives priority to waste prevention, followed by preparing for reuse, recycling, other types of recovery and finally disposal (e.g., landfill).
25 Year Environment Plan	The 25 Year Environment Plan sets out government actions to improve, regain and retain the natural world. The Plan sets out high level goals, which includes *"using resources from nature more sustainably and efficiently*" and "*minimising waste*".
Our Waste, Our Resources: A Strategy for England 2018	Sets out how the UK Government will preserve material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. The Strategy also outlines the Government's aims to minimise the damage caused to the natural environment by reducing and managing waste safely and carefully, and by tackling waste crime. It combines actions to take now with firm commitments for the coming years and gives a clear longer-term policy direction in line with the 25 Year Environment Plan.
Leicestershire Minerals and Waste Local Plan up to 2031	This Minerals and Waste Local Plan includes the spatial vision, spatial strategy, strategic objectives, and core policies which to guid the future winning and working of minerals within Leicestershire. These also guide the waste

	management development within the County. Key policies are outlined below at Paragraph 18.3.2.
Draft Resources and Waste Strategy (2022-2050)	This draft strategy reflects current global thinking on achieving net-zero climate change targets. It describes the recycling and waste management services to be delivered in Leicestershire from 2022 up to 2050, with a vision to work towards a circular economy and contribute to achieving net-zero carbon by 2050.
Waste Disposal Authority Plan (2018-2030)	This plan outlines the Council's commitment to delivering waste management services that prioritise prevention, reuse, recycling, and the reduction of landfill usage, while ensuring value for money for residents.
Guidance	
Planning Practice Guidance (PPG) on waste[x], published on 15 October 2015	The PPG, which supplements the NPPF, provides specific guidance to support the implementation of waste planning policy. It focuses on promoting sustainable waste management and ensuring that waste is managed in line with the principles of the waste hierarchy. This hierarchy prioritises waste prevention, followed by reuse, recycling, recovery, and disposal as a last resort. The PPG elaborates on how planning authorities should consider waste management in decision-making, including: • Safeguarding Waste Infrastructure: Ensuring existing waste management facilities are protected from incompatible developments. • Site Allocations: Identifying appropriate sites and areas for new waste management facilities to meet the needs of the local area while minimising environmental impacts. • Plan-Making: Integrating waste management considerations into local plans to align with national strategies and local waste needs. • Climate Change and Waste: Encouraging facilities and practices that contribute to a circular economy and reduce greenhouse gas emissions.

	This guidance aims to ensure that waste management is integral to the planning process, promoting sustainable practices that reduce reliance on landfill and encourage resource efficiency. It serves as a key tool for local authorities and developers in implementing waste policies effectively.
The Institute of Environmental Management and Assessment (IEMA) Guide to Materials and Waste in EIA	Guidance used to assess the potential impacts and effects from the Proposed Scheme, using the process and significance criteria it sets out. This guidance is referred to as 'the IEMA Guide' throughout this chapter.
Waste Duty of Care: Code of Practice (2018)	This Waste Duty of Care: Code of Practice was issued under Section 34 of the Environmental Protection Act 1990 and sets detail on how to safely and responsibly manage wastes. The Code details the actions to be taken so to prevent unauthorised treatment or disposal of waste, ensure adequate storage to prevent uncontrolled escape of waste and to properly transfer wastes to third parties.
British Standards Institution (2005) BS 5906:2005 Waste Management in Buildings – Code of Practice	The Standard details the requirements for the safe storage, collection, segregation and onsite treatment for residential and non-residential developments. The standard requires designers to ensure safe and easy access to waste facilities which adhere to the aesthetics of the site whilst avoiding social nuisance. Facilities should support the waste hierarchy and be designed in consultation with service users.

18.3.2. LCC has recently produced the Leicestershire Minerals and Waste Local Plan Up to 2031 which is referred to and used for assessing the operational cumulative effects in this chapter. Key policies applicable to this chapter include the following:

- Policy W1: Waste Management Capacity - "*The County Council will make provision for a sufficient range of waste facilities within the County of Leicestershire to manage the equivalent of the predicted arisings for the County up to and including 2031 and to meet the recycling, composting and recovery targets…*";
- Policy DM1:Sustainable Development - *"[…]Proposals should contribute to the three dimensions (economic, environmental and social) of sustainable development, as well as providing clear evidence of how a proposal would make a positive contribution to reducing its effects on climate change…"* ;Policy DM11: Cumulative Impact – "*Planning permission will be granted for minerals and waste development where it is demonstrated that cumulative impacts on the environment of an area or on the amenity of a local community, either in relation to the collective effect of different*

impacts of an individual proposal, or in relation to the effects of a number of developments occurring either concurrently or successively, are acceptable."

18.4. Baseline Conditions

Materials

18.4.1. A summary of the baseline conditions for materials, site arisings and waste are presented in this section. The baseline conditions align with the Study Areas defined in paragraph 18.2.10.

18.4.2. The development study area, which relates to the **Scheme** as set out in **Chapter 3**, comprises a mixture of arable farmland at **EMG2 Main Site**, **Highways Works** area and undeveloped land within EMG1 (referred to as Plot 16). The operation and maintenance of all facilities and activities located within the development study area requires products to support arable agriculture including fertilisers, perimeter fencing as well as the intermittent use of bulk products for routine works and repairs of the existing highways and access roads where not part of the public highway (e.g. lighting, paint, concrete, masonry, aggregate and asphalt for minor re-surfacing).

18.4.3. Although at the time of writing no specific data are available on materials currently required, professional judgement and guidance where appropriate has been used to define current material resource requirements in the development study area (**Table 18.10**). By comparison with regional and national availability of resources, consumption of materials for routine maintenance by the current assets at the development study area is minimal.

Table 18.10: Material Resource Requirements

Material	Estimated Quantity	Unit
Fertiliser[2]	9.5	tonnes (per annum)
Perimeter Fencing[3]	5.1	Km (over 10 years)
Highways[4]		

[2] Based upon total agricultural land mass estimated at 102 hectares (ha). Assumed the crops are cereals, the land is 'average' and local rainfall index is 1. The 'Nutrient Management Guide (RB209)' has been used to calculate the phosphate recommendation for wheat with an expected yield of 10 t/ha where straw is incorporated: 80 + (2 x 6.5) = 93 kg/ha.

[3] Total length of northern highways permitter (~1.2km). Fencing specification taken from BS EN 335-1:2006: typically consisting of 2 vertical posts every 2 meters (1.5 meters in height) and 3 rails. Wastage allowance considered 10%.

[4] Total highways length estimated as 2.8 km (1.3 km single-track and 1.5 km dual carriageway) with no street lighting. The materials required include asphalt, aggregate, sub-base, and concrete for kerbing (dual carriageway only). These estimates follow standard UK highway construction guidelines (e.g., Design Manual for Roads and Bridges (DMRB) and BS EN standards). Additional allowances (5–10%) for wastage and site-specific conditions are factored.

Asphalt	2,564	tonnes (over 20 years)[5]
Base Course	3,846	tonnes (over 20 years)
Sub-base	10,684	tonnes (over 20 years)
Concrete for Kerbing	540	tonnes (over 20 years)

Availability of Construction Materials

18.4.4. A summary of availability of the main construction materials in the Midlands and the UK is presented in **Table 18.11**. The overview excludes technological products but provides a context in which the assessment for material consumption during construction of the **Scheme** has been undertaken. Data are available for as available over years 2018 to 2024[xixii]; the most recent information has been presented.

Table 18.11: Availability of Main Construction Materials [to be completed]

Material Type	Leicestershire	UK	Units	Regional Availability as a % of National Availability
Sand and Gravel[a]	1.25 (2019)	53.2 (2022)	Mt	2.3
Permitted Crushed Rock[a]	344 (2020)	4,000 (2021)	Mt	0.1
Concrete Blocks[b]	No data.	5.2 (2022)	Mm^2	N/A
Primary Aggregate[a]	45 (2019)	150 (2020)	Mt	30
Recycled and Secondary Aggregate[a]	No data.	70 (2020)	Mt	N/A
Ready-mix Concrete[a]	No data.	15 (2020)	Mm^3	N/A
Steel[c]	No data.	7.2 (2021)	Mt	N/A
Asphalt[a]	1.2 (2019)	20 (2020)	Mt	17

[5] Typical worst-case scenario for design lifespan as specified by the Design Manual for Roads and Bridges (DMRB).

[a] sales	[b] stocks	[c] production
Mt million tonnes	Mm^2 million square metres	Mm^3 million cubic metres
GB: Great Britain (England, Wales and Scotland) figures used where UK figures (including Northern Ireland) are unavailable.		

18.4.5. Further analysis of the data suggests that across the UK, the availability of construction materials typically required for development in terms of stocks, production or sales remains buoyant, although information on steel production is not currently available at a regional level. Future trends are not available for scrutiny, and at the time of publication, it is noted that there may be short term fluctuations in supply.

Waste

18.4.6. The current land uses within the development study area are understood to generate minimal volumes of site arisings, limited to bi-products produced from the operation of agriculture and the maintenance of highways, including packaging and green waste. Most of these arisings would be expected to be diverted from landfill as a matter of good practice to reuse, recover or recycle materials.

18.4.7. The data presented in this section confirms the availability of waste management facilities in the expansive study area; these facilities are expected to enable suitable recovery of site arisings generated by the **Scheme**.

Construction Waste

18.4.8. Department for Environment, Food & Rural Affairs (DEFRA) data[xiii], summarised in **Table 18.12**, shows that within England the recovery rate for non-hazardous construction and demolition wastes (excluding excavation wastes) has remained above 90% since 2010.

18.4.9. As of November 2024, the most recent data available from DEFRA on the recovery rates for non-hazardous construction and demolition (C&D) waste in England extends up to the year 2020. According to DEFRA's "UK Statistics on Waste" publication, the recovery rate for non-hazardous C&D waste in England was 93.2% in 2020. Data for the years 2021, 2022, and 2023 have not yet been published. DEFRA typically releases waste statistics with a time lag to ensure data accuracy and completeness. Therefore, the most recent figures available are up to 2020.

18.4.10. Nationally, the UK has achieved remarkable success in waste recovery, with consistent recovery rates above 90% for construction and demolition waste, including non-hazardous materials. The government's emphasis on adhering to the waste hierarchy—prioritising reduction, reuse, and recycling—has contributed to these high rates. Policies such as landfill taxes and incentives for recycling and recovery have been instrumental in driving the UK's performance.

Table 18.12: Recovery Rate for Non-hazardous Construction and Demolition Wastes

Year	Generation (Mt)	Recovery (Mt)	Recovery rate (%)
2010	53.6	49.4	92.2
2011	54.9	50.8	92.5
2012	50.5	46.4	92.0
2013	51.7	47.6	92.0
2014	55.9	51.7	92.4
2015	57.7	53.3	92.3
2016	59.6	55.0	92.1
2017	62.2	57.9	93.1
2018	61.4	57.5	93.8
2019	62.3	58.3	93.6
2020	53.6	50.0	93.2

18.4.11. As of November 2024, the most recent data available for non-hazardous C&D waste recovery rates in Leicestershire extends up to 2019. According to the "Waste Needs Assessment" published by Leicester City Council in June 2021, non-hazardous waste produced in Leicester City achieved a total recovery rate of approximately 86% in 2019.

General Waste Management Practices

18.4.12. Based on the Environment Agency's Waste Data Interrogator for 2023, Leicestershire hosts a variety of waste management facilities. The categorisation and number of these facilities are as listed in **Table 18.13**.

Table 18.13: Leicestershire Waste Management Facilities Summary [to be completed]

Facility Type	Number of Sites
Incineration	2
Transfer	35
Treatment	28
Metal Recovery	15
Use of Waste	1

Total	**81**
Note: The numbers provided are based on the most recent data available as of November 2024. For the latest updates, please refer to the Environment Agency's official publications.	

18.4.13. These facilities are distributed across Leicestershire, including areas such as Leicester City, Loughborough, and Hinckley.

18.4.14. Based on the latest Environment Agency data for 2022, LCC's managed a total of approximately 1,200,000 tonnes of waste. The distribution across various management routes is detailed in **Table 18.14**.

Table 18.14: Waste Management Routes Summary

Waste Management Route	Inert[a] and Non-Hazardous[c] Waste (Tonnes)	Hazardous Waste[b] (Tonnes)	Total Waste (Tonnes)	Percentage (%)
Recovery	900,000	20,000	920,000	76.7%
Landfill	270,000	10,000	280,000	23.3%
Total	1,170,000	30,000	1,200,000	100%

NOTES:

[a] Inert waste is defined as waste:

- that does not undergo any significant physical, chemical or biological transformations;
- that does not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter from which it comes into contact in a way likely to give rise to environmental pollution or harm to human health; and
- where its total leachability and pollutant content and the ecotoxicity of its leachate are insignificant and, in particular, do not endanger the quality of any surface water or groundwater (see Directive 1999/31/EC 'The Landfill Directive').

[b] Hazardous waste describes any waste that displays one or more of the hazardous properties listed in Annex III of the Waste Directive (2008/98/EC).

[c] Non-hazardous waste describes waste that is neither classified as inert nor hazardous.

18.4.15. In 2022, approximately 76.7% of waste in Leicestershire was diverted from landfill through recovery methods such as treatment and incineration. This recovery rate, when compared to the England-wide recovery rate, which consistently exceeds 90% since 2010, Leicestershire's recovery rate is notably lower. This suggests opportunities for improvement in the county,

particularly in enhancing recovery processes for non-hazardous and inert wastes, where other regions have excelled. Leicestershire could benefit from adopting similar best practices to increase diversion rates, such as expanding incineration capacity or improving the efficiency of material recovery facilities.

18.4.16. Approximately 23.3% of waste in Leicestershire was disposed of in landfill sites in 2022. This figure is substantially higher than the national average, as the UK as a whole has seen landfill rates fall below 10% for non-hazardous waste, thanks to stringent waste policies and investments in alternative recovery infrastructure. For example, regions such as London reported landfill rates of 12% in 2022 which demonstrates effective waste management frameworks that significantly reduce reliance on landfill.

18.4.17. Leicestershire's higher landfill rate may be attributed to a combination of factors, including limited access to advanced recovery facilities, lower adoption of recycling initiatives, and the presence of local landfill capacity, which can sometimes discourage investment in alternative solutions. Addressing these challenges will be key to aligning the county's waste management performance with national benchmarks.

Landfill Capacity

[To be completed on receipt of final consultation]

18.4.18. Leicestershire County Council advises that projects intending to dispose of waste to landfill must ensure that the receiving facility has adequate capacity to accept waste throughout the development's lifecycle. This requirement supports sustainable waste management practices and minimises the risk of capacity shortfalls.

18.4.19. Furthermore, LCC has indicated that no new landfill proposals or significant expansions are currently planned or anticipated within the county's waste management strategy timeframe (20–25 years). Should any new or extended landfill proposals emerge, the council emphasises the need to align these developments with broader environmental objectives, ensuring that void-space is managed in accordance with sustainable waste management policies and local environmental strategies.

18.4.20. As the expansive study area takes in a geographical radius of 30 miles from the centre of the Site, landfill capacity within the following county councils have been considered:

- Derbyshire;
- Leicestershire;
- Lincolnshire;
- Nottinghamshire;
- Staffordshire;
- Warwickshire; and
- West Midlands Combined Authority.

18.4.21. Based on the latest data from the Environment Agency[xiv], the landfill capacities in Leicestershire for 2022 and 2023 are provided in **Table 18.15**.

Table 18.15: Leicestershire Landfill Capabilities

Landfill Type	Capacity in 2022 (m^3)	Remaining Capacity in 2023 (m^3)	Change in Capacity (m^3)	Change in Capacity (%)
Hazardous (merchant)	0	0	0	0%
Hazardous (restricted[a])	535,048	535,048	0	0%
Inert	23,832,793	21,370,810	- 2,461,983	- 10.33%
Non-hazardous (including stable hazardous waste cells)	53,733,279	51,652,527	- 2,080,752	- 3.87%
Total	**78,101,120**	**73,558,385**	**- 4.5 (Mm^3)**	**- 7.10%**

Note:
[a] Restricted landfill sites only accept waste from restricted sources and producers, e.g. site operator/managing site.

18.4.22. These updated figures show a general decrease in landfill capacity across all categories, with no capacity available for hazardous (merchant or restricted) waste in 2022 or 2023. The most significant reduction is in inert landfill capacity, which fell by 10.33% between 2022 and 2023. Overall, the total remaining landfill capacity in Leicestershire decreased by approximately 7% during this period, highlighting ongoing pressures on waste management infrastructure.

18.4.23. Baseline data indicates that inert, non-inert and total landfill capacity is likely to become an increasingly sensitive receptor throughout the duration of the construction phase and in operation of the **Scheme**.

18.4.24. As of September 2024, the remaining landfill capacity in the UK (excluding the County Councils listed in Paragraph 18.4.20) was considered to total 302,914,637 m^3**. Table 18.16** provides a breakdown of capacity.

Table 18.16: UK Landfill Capacity

Landfill Type	Capacity in 2023 (m^3)
Hazardous (merchant)	9,680,003
Hazardous (restricted[a])	159,742
Inert	100,877,912
Non-hazardous (including stable hazardous waste cells)	141,622,655
Total	**252,340,312**

Recycling Facilities

18.4.25. Leicestershire hosts several recycling facilities that have evolved over recent years to enhance waste management and recycling capabilities. Below is a summary of key facilities, their capacities in 2021, and their current capacities (known at the time of writing) in the expansive study area:

Table 18.17: Leicestershire Recycling Facilities Summary

County Council	Facility	Location	Capacity in 2021	Current Capacity (2022)	Notes
Leicestershire	Casepak Materials Recycling Facility	Leicester	~150,000 tonnes/year	~150,000 tonnes/year	Processes dry mixed recyclables with a recovery rate of approximately 97.5%.
	Enva Leicester Recycling Facility	Wesley Street, Leicester	~100,000 tonnes/year	~150,000 tonnes/year	Reopened in February 2023 after modernization, increasing capacity to around 150,000 tonnes/year and diverting over 85% of waste from landfill.
	Leicestershire County Council RHWS	Various locations	Varies by site	Varies by site	Operates 13 recycling and household waste sites; specific capacities are not detailed in available sources.
	Leicester City Council Recycling Centres	Leicester	Varies by site	Varies by site	Manages household recycling centres and a reuse shop; specific capacities are not detailed in

County Council	Facility	Location	Capacity in 2021	Current Capacity (2022)	Notes
					available sources.

Energy From Waste

18.4.26. As of November 2024, Leicestershire hosts one operational Energy-from-Waste (EfW) facility: the Newhurst Energy Recovery Facility (approximately 8 miles / 13 kilometres from the **Scheme**). Located near Shepshed, this facility began full operations in June 2023. It processes up to 455,000 tonnes of residual waste annually, generating approximately 42 megawatts of electricity—sufficient to power around 80,000 homes.

18.4.27. There is only one other EfW facilities within the expansive study area. The Biomass Power Plant, Widmerpool, Nottingham is approximately 12.5 miles / 20 km to the east of the **Scheme**. This plant recycles around 52,000 tonnes of waste wood annually, generating approximately 6.8 megawatts of electricity.

Hazardous Waste

18.4.28. Based on the EA Waste Data Interrogator, there are nationally a limited number of hazardous waste landfill sites. The management and disposal of hazardous waste is a specialist process and usually would involve some interim treatment processes prior to disposal at landfill. The nearest hazardous waste landfill site is the East Northants Resource Management Facility located near Peterborough which is approximately 50 miles / 80km from the **Scheme**. The calculation below calculates the void capacity for Hazardous waste sites for 2020 and forecasted for 2025 both at a Regional and National level. In all cases the sensitivity is very high.

Table 18.18: Hazardous Waste Landfill Site Sensitivities

	Regional	Nationally
Capacity in 2020 (volume) Capacity in 2020 (tonnage) At 1.2[6] tonnes per m^3	= 0.5M m^3 = 0.6M tonnes	= 16.4M m^3 = 19.7M tonnes
Material received 2020 2020 sensitivity	0.1M tonnes 0.1/0.5 x 100% = 20% (Very High)	0.85M tonnes 0.85/19.7 x 100%

[6] *Using WRAP Waste Density Conversion Factor*

		= 4.3% (Very High)
Projection of material received in 5 Year period (tonnage) 2025 Capacity based on 5-year projection 2025 sensitivity	= 0.5M tonnes = 0.1M tonnes Insufficient capacity – very high	= 4.25M tonnes = 15.45M tonnes 0.85/15.45 x 100% = 5.5% (Very High)

Commercial and Industrial Waste Management

18.4.29. Commercial and industrial (C&I) waste is generated by business and industrial activity and will therefore occur widely within the region with a particular concentration in more urbanised areas. Certain elements of the C&I waste stream, such as mixed ordinary C&I waste, can be very similar to household waste and can often be dealt with through similar treatment and disposal processes. C&I waste can also contain hazardous substances which require management at specialist facilities.

18.4.30. Information on C&I waste generation in England is currently provided in the UK Statistics on Waste report[xv]. Whilst this report does not provide a regional breakdown of C&I arisings, it estimates that approximately 33.6 million tonnes of C&I waste was generated in England in 2022. Since 2010, the lowest amount of C&I arisings generated in England was 31.7 million tonnes in 2014, whilst the lowest amount was 37.2 million tonnes in both 2018 and 2019. C&I waste accounted for 19% of total waste generation in the UK in 2018.

18.4.31. C&I waste is currently collected within the expansive study area by a large number of private waste companies. There is also a considerable network of waste facilities that are used to bulk, transfer, treat and dispose of C&I waste.

18.4.32. [This section to be completed on receipt of final consultation].

Future Baseline

18.4.33. In the future baseline it is considered that the current land use within the **Scheme** would cease. Consequently, no significant changes to the baseline for materials and waste are anticipated in the future as a result of not progressing with the **Scheme**.

18.5. Potential Impacts

18.5.1. This section details the assessment of impacts and effects for the **Scheme** during both the construction and operation phases, considering the embedded design, mitigation and enhancement measures detailed in Section 18.6.

Construction Effects

18.5.2. The likely significant effects for materials and waste associated with the construction phase are set out below.

18.5.3. The potential impacts associated with material consumption and waste generation and disposal during construction are summarised in **18.19.**

Table 18.19: Construction Material and Waste Impacts

Element	Direct Impacts	Indirect Impacts
Materials	Consumption of natural and non-renewable resources.	• release of greenhouse gas emissions (through transportation); • water consumption; • visual impacts, noise, vibration and other nuisance issues; and • human health.
Waste	Reduction in landfill capacity.	• release of greenhouse gas emissions (through transportation and management); • ecological impacts; and • visual impacts, noise vibration and other nuisance issues.

Consumption of Materials

18.5.4. Key construction materials estimated to be required are presented in **Table 18.20**. The information provided describes the material type, estimated quantity and any available information relating to the use of the material in the construction of the **Scheme**.

18.5.5. To estimate the quantity of materials for the construction, standard construction benchmarks for material quantities were applied[7], including Building Regulations Part L for Commercial and Warehouse Buildings.

Table 18.20: Construction Material Estimations [to be completed]

Material Assets	Quantity (Tonnes)	Use of Material in the Proposed Scheme
Aggregate	60,120	Comprises granular sub-base material for pavement, footways and landscaping areas and surface chippings.
Asphalt (Bituminous mixtures)	22,896	For surfacing.
Concrete	221,760	This includes reinforced concrete for structures, foundations, piling and pre- cast concrete for drainage.
Earthworks (imported material)	[to be completed]	Engineered fill material for ground raising and topsoil.
Gravel	1,750	For drainage bedding.
Steel	10,921	Used in concrete reinforcement, sheet piling and drainage equipment.
Plastics (excluding packaging)	3,000	Drainage pipework and lining membrane; cable ducts, flue gas ducting and geotextile sheeting.
Steel (carbon and stainless)	29,840	Specialist plant and equipment, including Absorber Column(s) and Stack(s) for the Carbon Capture Facility.
Note: These estimates are based on standard requirements. Actual quantities may vary depending on specific design requirements, structural loads, and reinforcement detailing.		

[7] Aggregate: 2,200 kg/m³ (standard for sub-bases and structural fill). Design Manual for Roads and Bridges (DMRB). Sub-base layers for hardstanding and roadways require 0.15–0.20 m³/m² for adequate load-bearing capacity.
Asphalt (Bituminous mixtures): 2,400 kg/m³ for road surfaces, 100 mm depth. DMRB Vol. 7 Section 2 (Pavement Design).
Concrete: 0.20–0.30 m³/m² of floor area.
Earthworks: 1,800 kg/m³ for imported materials.
Gravel: 2,200 kg/m³ for drainage and landscaping.
Steel (carbon and stainless): 80 kg/m² for structural steel in warehouses and bus terminals.
Plastics (pipes, insulation): 5–10 kg/m² for building floors.
Steel piping: Estimated at 5 kg/m² for infrastructure.

18.5.6. At this preliminary stage of the project, we acknowledge that certain data gaps exist, which is to be expected as the design evolves and progresses. These gaps will be addressed as part of the ongoing development process. The appointed consultant (BWB Consulting) will be responsible for identifying, collating, and completing the required data to ensure that these gaps are filled comprehensively. This information will be incorporated into the final assessment and submitted in support of the application, ensuring a robust and thorough evaluation of all relevant aspects.

18.5.7. The specification of materials is anticipated to be confirmed prior to the commencement of the construction of the **Scheme**. Using professional judgement to apply the criteria set out in **Table 18.2**, the sensitivity of material resources is therefore considered medium.

18.5.8. Where data are available, as reported in the Baseline (Section 18.5), the percentage of material resource consumption for the **Scheme** has been calculated and presented in **Table 18.21**. This is based on current data rather than future trends.

Table 18.21: Percentage of Material Resource Consumption

Material	Production/Sale Data for the Region* (Million Tonnes)	Scheme Requirements (Tonnes)	Percentage of Available Resource Consumed by Proposed Scheme (%)
Primary aggregate	150	61,870	0.04
Ready-mix concrete	15*	221,760	1.48
Asphalt	1.2	22,896	1.91
Steel	7.2*	40,761	0.57
* nationally where regional data unavailable.			

18.5.9. Based on the criteria set out in **Table 18.3** using professional judgement and considering the nature and scale of the **Scheme**, the magnitude for material resources consumption is considered minor as one or more materials (primary aggregate and ready-mix concrete) is between 1-5% by volume of the regional baseline availability.

18.5.10. Based on the criteria set out in **Table 18.5**, the significance of effect for material resource consumption is therefore currently considered to be Minor (Not Significant).

Waste

Demolition Waste

18.5.11. The maintenance of existing roads generating additional material, these have not been quantified, instead being included in the quantities for earthworks. Material generated would likely include crushed concrete, aggregate road base and road plannings.

18.5.12. 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, either onsite or offsite, to meet specification requirements.

18.5.13. 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 would be recyclable and not go to landfill. The magnitude of the non-Hazardous / inert waste is considered to be negligible (not significant).

Earthworks

[section to be completed]

18.5.14. In regards to the **EMG2 Main Site**, given its topography, the site requires a cut and fill strategy to produce suitable development plateaus.

18.5.15. The majority of excavated material (non-organic) is expected to be reused onsite e.g., a cut and fill balance is intended. For the purpose of this assessment, only if excavated material is not required or is unsuitable for the development or specified receiver sites it would become waste.

18.5.16. Further details on the ground conditions are included in **Chapter 14: Ground Conditions**. This includes an assessment of the materials suitability for reuse of soils and aggregates.

18.5.17. The volume of cut has been estimated at [TBC] million cubic metres of material. The earthworks strategy has been designed to achieve a cut and fill balance, material quality would be assessed to ensure material is placed in a suitable location onsite, such as within the mitigation mounding, minimising the requirement to dispose of excavated material. With offsite disposal volumes expected to be minimal (less than 1% of the regional capacity), the magnitude of impact for earthwork material being disposed of to landfill as non-hazardous or inert waste is assessed as negligible (not significant).

18.5.18. There are no known contamination sources that would cause the ground to be impacted to levels that could classify soils as hazardous waste and therefore the magnitude of impact from hazardous waste from the earthworks is no change (not significant).

Construction Waste

18.5.19. Waste produced from the construction of buildings within the **Scheme** is displayed in **Table 18.22**. This figure has been calculated using Smart Waste BRE Waste Benchmark Data[xvi] and assumes the buildings to be constructed are industrial buildings, producing an average quantity of 12.6 tonnes of construction waste per 100 m2. This data provides an estimate of waste produced during the construction phase only and does not include demolition, excavation, or groundworks waste.

Table 18.22: Construction Waste Summary

Total Floorspace of New Buildings (m2) (excluding mezzanines)	**Total Building Construction Waste (tonnes)**
326,500	37,800

18.5.20. On the assumption that the recycling rates would be 90% to meet national performance, with the remaining 10% sent to landfill, the total amount of construction waste to be recycled is 42,000 tonnes with the remaining 7,800 tonnes to be sent to landfill.

18.5.21. Waste produced from the construction of roads and paved areas within the **Scheme** has been calculated based on an assumed average wastage rate of 3% of total material use and assuming surface and road base thickness of 0.5m, is displayed in **Table 18.23**.

Table 18.23: Road and Paved Areas Construction Waste

Area of roads and hardstanding (m^2)	**Volume of material (m^3)**	**Estimated construction waste (tonnes)**
107,400 m^2	53,700 m^3	1,611 tonnes

18.5.22. Assuming a recycling rate of 90% and the remaining 10% being sent to landfill, 1,450 tonnes will be recycled and 161 tonnes is to be sent to landfill.

18.5.23. The magnitude of impact from the total quantity of construction waste (calculated using **Tables 18.2** and **18.3**) is considered to be negligible, having regard to available capacity. The impact from construction waste is therefore considered to be not significant.

18.5.24. A summary of anticipated construction impacts for both materials use and waste, and their likely effects, is presented in **Table 18.24**.

Table 18.24: Construction Materials and Waste Impacts and Effects

Activity	**Activities with Potential impacts on material resource / waste**	**Sensitivity of Receptor**	**Description of Magnitude**	**Significance**
Site preparation earthworks	Excavation and filling using site won materials, disposal of unsuitable material	Very High	Negligible	Negligible

Activity	Activities with Potential impacts on material resource / waste	Sensitivity of Receptor	Description of Magnitude	Significance
Construction	Use of quarried aggregate for construction (Concrete, sub-base, road surfacing)	Medium	Minor	Negligible
Construction	Generation of construction waste	Low	Negligible	Negligible

Transportation of Waste

18.5.25. The movement of waste would be undertaken by road. The extent of the impacts would be proportional to the waste generated and any reduction in waste would reduce the impacts on the road network. During construction works the reuse of material onsite would reduce waste movements. The impacts on traffic (**Chapter 6**), noise (**Chapter 7**), air quality (**Chapter 8**) and climate change (**Chapter 19**) are assessed elsewhere in this ES. Any betterment in the reduction of waste generated would automatically reduce the transportation impact.

Operational Effects

18.5.26. The likely significant effects for materials and waste associated with the operation phase are summarised in this section.

18.5.27. It is assumed that operational waste will comprise of standard bi-products associated with warehouse and non-specialised industrial operations. These wastes can generally be grouped into categories based on their source and material composition. Below is an outline of standard wastes associated with warehousing operations:

- Packaging - plastics, cardboard, wood, metal strapping and synthetic polymers such as polystyrene);
- General Waste - includes non-recyclable items like food wrappers, office waste, or small quantities of miscellaneous items;
- Damaged or Unsellable Goods - products that cannot be resold or reused due to damage or expiration;
- Hazardous Waste – batteries, Electrical and Electronic Equipment (WEEE) including outdated or broken machinery, lighting fixtures, or IT equipment, cleaning products and paints, oils / lubricants and solvents used in maintenance; and

- Organic Waste – such as food waste and compostable materials such as biodegradable packaging.

Waste Generation

18.5.28. **Table 18.25** estimates the likely waste generation from the operations buildings. These estimates are based upon floor area and appropriate benchmark metrics as outline in Section 18.2.

Table 18.25: EMG2 Main Site Building Operation Waste Generation Estimations

Description	**Indicative Gross Internal Area (GIA) (m^2) (excluding mezzanine]**	**Weekly General Waste Arisings (Tonnes)**	**Annual General Waste Arisings (Tonnes)**	**Weekly Recycling Waste Arisings (Tonnes)***	**Annual Recycling Waste Arisings (Tonnes)**
Ancillary Offices	30,000	750	39,000	675	35,100
Warehouse / Industrial Unit	270,000	675	35,100	607.5	31,590
Total	**300,000**	**1,425**	**74,100**	**1,282.5**	**66,690**
**recovery targeted at 90%*					

Waste Disposal

18.5.29. Based upon the anticipated operational waste arisings outlined in this chapter and taking into consideration the receptors of energy from waste facilities and landfill facilities, **Table 18.26** shows the magnitude and sensitivity that the operational wastes would have on waste infrastructure in the expanded study area.

18.5.30. As per IEMA guidance, the assessment considers the percentage depletion of remaining landfill capacity or remaining permitted capacity in other final management capacity (energy from waste facilities). The assessment includes use of landfill, and energy from waste, for general wastes simply to demonstrate the negligible impact upon either option given the small volumes of general wastes.

Table 18.26: Operational Wastes Magnitude and Sensitivity

Operational Waste	Assumed Waste Fate	Available Capacity (%)	Sensitivity (%)	Magnitude
General waste	Energy from Waste	450,000 tonnes per annum	<15% High	Negligible
	Recycling centres	>300,000 tonnes per annum	<20% Very High	Negligible
	Combined EfW & Recycling centres	>750,000 tonnes per annum	<9% High	Negligible
	Non- hazardous landfill (90% diversion per annum)	61,799,575 tonnes**	<0.01% Negligible	Negligible
***conversion density considered 5kg/l*				

18.5.31. Based upon the magnitude of impact, and sensitivity of receptors, the operational wastes from the **Scheme** will result in a Negligible effect (Not Significant) upon landfill capacity and a Minor Adverse (Not Significant) effect upon recovery facilities within the expansive study area.

18.6. Mitigation Measures

[to be completed]

Embedded Mitigation Measures

18.6.1. This section sets out the embedded design, mitigation and enhancement measures which are relevant to the materials and waste assessment for the construction phase and operation phases. The Design Approach Document are commitments which will govern the design of the **Scheme** during the detailed design stage. The design strategy which is embedded as part of the **Scheme**, as set out within Design Approach Document are considered to be embedded mitigation for the purposes of the assessment presented in this chapter.

18.6.2. The measures in the Construction Environmental Management Plan (CEMP) has been submitted and provided at **Appendix [3x]**. This will form the basis of the pCEMP (Phase CEMP)

brought forward for each phase post-consent, to be in substantial accordance with the CEMP, as secured by DCO requirement.

Additional Mitigation

Construction

18.6.3. Measures would be implemented to collectively mitigate the impacts identified from both the use of materials and the management of waste in relation to the **Scheme**. 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.

18.6.4. 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.

18.6.5. The principal mitigation measure relating to this topic is the implementation of a CEMP, a CEMP has been submitted as part of the DCO application. The pCEMP would be developed during the detailed design phase (i.e., before the start of construction) and implemented during the construction phase. The CEMP includes the following:

- Details of the approach to environmental management throughout the construction phase, with the primary aim of mitigating any adverse impacts from construction activity on the identified sensitive receptors;
- methods for the prevention and control of any potential short-term construction phase impacts (e.g., construction dust, and the risk of accidental spillages of contaminating materials) and also permanent impacts (e.g., disturbance to vegetation, archaeology and heritage);
- good materials management methods, such as location of temporary haul routes and re-use of temporary works materials from haul routes, plant and piling mats etc; and
- risk/impact-specific method statements and strategic details of how relevant environmental impacts would be addressed throughout the **Scheme**.

18.6.6. Although not required by the regulations, a Site Waste and Materials Management Plan (SWMMP) would be regularly updated during the lifetime of the **Scheme**. The SWMMP identifies:

- 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.

18.6.7. Engineering specifications and a Material Management Plan (MMP), part of the Site Waste and Materials Management Plan (SWMMP), would outline the suitability of material for re-use onsite and offsite in respect to structural and contamination status. It is anticipated that an MMP would be secured as a Requirement of the DCO and be updated with additional detail once building design has been confirmed and materials are known post-consent

18.6.8. Topsoil strip volumes can be minimised by measurement of organic content of soils with depth, so there is a scientific definition of the interface between topsoil and subsoil rather than a borehole log visual interpretation. This will minimise the volume stripped. Cut and fill of subsoils will then take place to form the earthworks plateaus and the required levels for formation of the infrastructure, which will be designed to balance.

18.6.9. The topsoil removed will first be used in the following hierarchy:

- Topsoil will be set aside for re-use in on site landscaping requirements (used in permanent works)
- Topsoil will be used to create the various noise / visual bunds (used in permanent works)
- Topsoil requirements for offsite BNG areas will be taken from the site (used in permanent works)
- Topsoil will be placed back on plots for future development to protect the formation until they are ready to come forward (used in temporary works)
- Topsoil may be used to create surcharge loading if geotechnical conditions require ground improvement (pre-loading technique) (this will be a temporary use)
- Residual topsoil following all these demands being met will be stockpiled for storage for long term duration of the development.

18.6.10. During the extended development programme, topsoil will be advertised for sale for use in agricultural or biodiversity uses or to meet the needs of developments in the region.

18.6.11. As each plot comes forward and topsoil is released from temporary uses, the topsoil recovered can be added to storage, then sold down over a period of time until the next plot is stripped and adds new topsoil to the quantity stored.

18.6.12. Topsoil quantities can be managed through the construction phase of the whole development by additional techniques introduced into the strategy to manage volume by creating additional uses:

- Chemical treatment and / or mixing with subsoils to reduce the organic content and enable treated topsoil to be used in the general earthwork
- Overdig of non sensitive areas (balancing ponds, landscaping areas etc that are not vulnerable to settlement) to create borrow pits to swap usable subsoil material for non-treated topsoil material, again, to be used in the general earthwork

18.6.13. When the development gets to the final plots there is likely to be a small quantity of residual topsoil that needs to be disposed of quickly to facilitate plot construction. This small fraction may be destined for landfill if a suitable home cannot be found at the right time.

18.6.14. An MMP would:

- Demonstrate the quantity of material to be reused on site;
- identify the origin of the material to be used on site, and/or identify the receiver site for surplus material; and
- demonstrate that the material is suitable for reuse and there would be no risk to either human health or the environment by reusing the material either on site or on the receiver site.

18.6.15. Implementation of the SWMMP and the accompanying MMP would ensure that material reuse is maximised by minimising waste at source (reducing the requirement for new construction materials) and during construction. For example, this could include screening, crushing, and recycling of demolition materials onsite, or the use of in-situ recycling of tar bound bituminous materials. Further, an MMP allows for imported material to come from donor sites as waste material or material for reuse.

18.6.16. The assumption in this assessment is that all material from the cut and fill exercise to develop a development plateau would be suitable for reuse onsite. The MMP controls the quantity of this excavated material classified as waste and this may require the material to be managed in accordance with the Definition of Waste: Development Industry Code of Practise (CL:AIRE, 2011).

18.6.17. The reuse of site won materials would be subject to conformance with material specification and assessment criteria to ensure suitability for use. Any materials that do not initially comply to suitable for use criteria would be treated or processed until suitable for reuse.

18.6.18. In addition, the MMP outlines the material management options for donor sites. Both for material that remains unsuitable for reuse such as surplus topsoil that may be suitable for use on other donor sites and the Main HNRFI Site could act as a receiver site allowing material from other sites where the material may meet the specifications thus avoiding the waste classification subsequent disposal of material to landfill.

Storage of materials and waste

18.6.19. Measures to control the management and temporary storage of materials and waste during construction are detailed within the CEMP.

18.6.20. It is anticipated that waste would 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 should be used to clearly identify the material to be stored in each area and the site set up should be continuously reviewed and modified where necessary to maximise the opportunity for reuse and recycling.

18.6.21. It is expected that temporary storage areas would 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. The area to be used for stockpiling topsoil should be sized appropriately so that the height of the pile does not need to extend above 3m.

Operational Phase

18.6.22. The assessment has concluded that the effects of material consumption and waste generation during the operational phase are not significant. However, best practice design and operation measures to minimise impacts are considered and the occupiers will operate the **Scheme** using existing onsite waste prevention, minimisation and management processes and procedures to drive good practice behaviour and contracts, to maximise action in the highest tiers of the Waste Hierarchy and adherence to the proximity principle. Circular Economy practices will be identified and considered to design out wastes, reduce wastes and to divert materials from landfill, into other productive uses.

18.6.23. Examples of mitigation measures that will be considered to reduce operational materials and operational waste may include the following:

- Operators will engage early with Contractor(s) to identify opportunities to move wastes up the hierarchy through, for example, valorising of municipal and industrial wastes into new and valuable materials using collaboration and regional synergies.
- Exploring opportunities to move the treatment of hazardous wastes up the hierarchy from landfill to recovery or recycling once compositions and tonnages are known. For example, this ES has modelled the significance of impacts of operational wastes by considering the treatment of materials within energy from waste recovery plants or landfill sites. Once the composition and tonnages are better known, the Applicant will explore opportunities to move these wastes up the hierarchy using alternative recovery, valorisation or recycling methods.
- Ensuring that consumables and other materials include a high level of recycled and secondary content where technically and economically feasible.
- Careful estimation and ordering of the operational material needed onsite at any given time to minimise the likelihood of surplus materials. This will also reduce the risk of material being stored onsite for long periods of time, with a risk of damage or decay.
- Source reusable leased plant, assets and other aspects for temporary periods which can then be returned to the supplier for reuse, rather than to procure new components which then have to be sold, recycled or disposed when no longer required.
- The Applicant will engage with suppliers to identify opportunities to procure materials and supplies that afford higher sustainability performances than typical industry standards.
- The Applicant will engage with suppliers to ensure that, where feasible, procurement agreements include takeback schemes wherein suppliers are obliged to take back any packaging as well as surplus or spent materials;
- The Applicant will engage with local third parties, such as educational establishments, to divert suitable waste materials into use as supplies for local projects or into use within local college courses. This will move wastes up the hierarchy from recycling to reuse.

Management of hazardous waste

18.6.24. It is not expected that any significant quantity of hazardous waste would be produced during the operational phase. Although there would be oily rags and other light plant maintenance wastes that would be hazardous. Any hazardous waste produced during the operational phase would be segregated and stored securely before being disposed of by an approved and appropriately licensed hazardous waste contractor, in accordance with the Hazardous Waste Regulations (as amended 2015) and the associated Hazardous Waste Classification Guidance (2015).

18.7. Residual Effects

[section to be completed]

18.7.1. Receptors which were assessed with potential to be significantly impacted during the construction phase have been reassessed with the 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. In addition, material treated or processed and then reused onsite would 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 MMP the material is more likely to be managed in a Waste Transfer Station than sent to landfill. A small proportion of any earthwork material sent to a waste transfer station would be sent to landfill reducing the impact to a **negligible significance**.

18.8. Cumulative Effects

[section to be completed]

18.8.1. There may be additional impacts on materials use and waste disposal when assessed in combination with other schemes. The assessment of construction waste is included in the baseline assessment within this chapter with a review of capacity capturing the effects from any other scheme currently operating and feeding the landfill sites.

18.8.2. The Leicestershire County Council Minerals and Waste Local Plan identifies the potential increase in capacity for minerals and landfill volume and the inclusion of the **Scheme** for mineral requirement and landfill use in its projections going forward. The Barwell and Earl Shilton SUEs were the exception and the plan identified a requirement for new waste sites to be incorporated into the employment land allocated within the master planning of these urban extensions.

18.8.3. In conclusion, future schemes will generate construction and operational waste and feed into the local waste management facilities, diminishing the capacity available for the **Scheme**. However, regional development also provides opportunities for local sources of material – both through donating surplus earthwork material and/or through extensions to quarries. Other schemes can also act as receiver sites for any surplus material that arises as a result of the **Scheme**. Overall, it is expected that the cumulative effects will increase the impacts from the construction and operational waste generated by the **Scheme** but as the volume of waste compared to the waste management capacity is small, the effect is assessed to be not significant.

18.9. Summary of Effects and Conclusions

Materials

18.9.1. It is anticipated that a large quantity of materials would be required for the construction of the **Scheme** though it has been determined that there is sufficient availability within both the expansive study area and the UK.

18.9.2. The design and mitigation measures outlined would ensure the efficient use of material assets on site, the reuse of material is made a priority and recycled or secondary material is used wherever technically appropriate and economically feasible. This would be in line to achieve the regional percentage targets specified in Leicestershire. Overall, with the use of mitigation measures in place (such as a Material Management Plan), the **Scheme** is not expected to have any significant residual effects.

Waste

18.9.3. The **Scheme** will be a generator of waste during both construction and operation. The key environmental effect resulting from the generation and management of waste is the impact on reduction or alteration in the regional capacity of waste infrastructure. The mitigation measures outlined would ensure the implementation of circular economy and the waste hierarchy principles, aimed to minimise the generation of waste in the first place.

18.9.4. A worst-case scenario is anticipated where inert waste would generate the largest quantities of waste from the **Scheme**. In a worst-case scenario, non-hazardous waste arisings are anticipated to be less than 1 percent of the regional non-hazardous landfill void capacity.

18.9.5. Potential arising of hazardous waste is not yet quantified and worst-case scenario does not anticipate hazardous waste arisings to be greater than the 0.35 percent of the regional hazardous landfill void capacity.

18.9.6. Following the implementation of the design and mitigation measures, as outlined within the assessment, it is concluded that there are no significant effects.

18.9.7. A summary of effects and mitigation is provided in **Table 18.27**.

Table 18.27: Summary of Effects and Mitigation

Description of the Effect	**Sensitive Receptor**	**Significance of Effect**	**Design, Mitigation, Enhancement measure**	**Residual Effect**
Construction Phase				
Consumption of material resources	Material resource availability	Negligible Adverse (Not Significant))	Materials Management Plan	**Negligible Adverse** (Not Significant)
Disposal and recovery of waste	Landfill void capacity	Negligible Adverse (Not Significant)	Construction Environmental Management Plan Site Waste Management Plan	**Negligible Adverse** (Not Significant)
Operation Phase				
Consumption of material resources	Material resource availability	Minor Adverse (Not Significant)	Operational Environmental Management Plan	**Negligible Adverse** (Not Significant)
Disposal of waste	Landfill void capacity	Negligible Adverse (Not Significant)	Operational Environmental Management Plan Earthworks Strategy 90% Landfill Diversion Target	**Negligible Adverse** (Not Significant)
Recovery of waste	Energy from waste and recycling centres	Minor Adverse (Not Significant)	Operational Environmental Management Plan	**Minor Adverse** (Not Significant)

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