Fosse Green Energy

EN010154

6.3 Environmental Statement Appendices

Appendix 14-E: Materials and Waste Impact Assessment Methodology and Baseline

Planning Act 2008 (as amended)

Regulation 5(2)(a)

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

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Planning Act 2008

The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulation 2009 (as amended)

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Development Consent Order 202[ ]

6.3 Environmental Statement Appendices

Appendix 14-E: Materials and Waste Impact Assessment Methodology and Baseline

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Planning Inspectorate Scheme Reference	EN010154
Application Document Reference	EN010154/APP/6.3
Author	Fosse Green Energy Limited

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Tables

1. Materials and Waste Impact Assessment Methodology and Baseline

1.1 Introduction

1.1.1 This appendix presents the methodology and baseline for the assessment of materials and waste (**Section 14.5** in **Chapter 14: Other Environmental Topics [EN010154/APP/6.1]**).

1.2 Sensitivity

1.2.1 The sensitive receptors for the assessment of the construction, operation, and decommissioning phases of the materials and waste impacts are described below.

Materials

1.2.2 The sensitivity of materials relates to the availability and type of construction material to be consumed by the Proposed Development. The IEMA Guidance (Ref 1) criteria described within **Table 1** is used to determine the sensitivity of materials.

Table 1: Materials Receptor Sensitivity

Sensitivity	Criteria for Materials Receptor Sensitivity
Negligible	On balance, the key materials required for the construction of the Proposed Development 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	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock. *And/or* are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock.

Sensitivity	Criteria for Materials Receptor Sensitivity
	And/or are available comprising some sustainable features and benefits compared to industry-standard materials.
High	On balance, the key materials required for the construction of the Proposed Development 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	On balance, the key materials required for the construction of the Proposed Development are forecast 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.

** Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.*

Waste

1.2.3 The sensitivity of waste relates to availability of landfill capacity in the absence of the Proposed Development as outlined in the IEMA Guidance (Ref 1) *"landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste"*. The sensitivity of landfill capacity is assessed based on a review of historic landfill void capacity trends where available and information from relevant policy documents.

1.2.4 The criteria described within **Table 2** and **Table 3** is used to determine the sensitivity of landfill capacity.

1.2.5 As stated in the IEMA Guidance (Ref 1) *"due to uncertainties relating to future technologies and infrastructure, this first edition of the guidance does not incorporate a proposed methodology to assess impacts and effects during decommissioning or end of first life"*. However, the criteria in the IEMA Guidance (Ref 1) are applied to decommissioning for the Proposed Development.

Table 2: Inert and Non-hazardous Landfill Capacity Sensitivity

Sensitivity	Criteria for inert and non-hazardous landfill capacity sensitivity
Negligible	Across construction, operation and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-

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

Table 3: Criteria for hazardous landfill capacity sensitivity

Sensitivity	Criteria for Materials Receptor Sensitivity
Negligible	Across the construction, operation and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to remain unchanged or is expected to increase through a committed change in capacity.
Low	Across the construction, operation and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to reduce minimally by <0.1% as a result of wastes forecast.

Sensitivity	Criteria for Materials Receptor Sensitivity
Medium	Across the construction, operation and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to reduce noticeably by 0.1-0.5% as a result of wastes forecast.
High	Across the construction, operation and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to reduce considerably by 0.5-1% as a result of wastes forecast.
Very High	Across the construction, operation and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is: • expected to reduce very considerably (by >1%); • end during construction or operation: • is already known to be unavailable; or, • would require new capacity or infrastructure to be put in place to meet forecast demand.

1.3 Magnitude of Impact

1.3.1 The magnitude of impact describes the degree of variation from the baseline conditions as a result of the Proposed Development. The IEMA Guidance (Ref 1) 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 or regional availability from the construction of the Proposed Development. The criteria used to assess the magnitude of impact for materials are provided in **Table 4.**

Table 4: Materials Magnitude of Impacts

Magnitude of Impact	Criteria for Materials Magnitude of Impacts
No change	Consumption of no materials is required.
Negligible	Consumption of no individual material type is equal to or greater than 1% by volume of the regional or national* baseline availability.
Minor	Consumption of one or more materials is between 1-5% by volume of the regional or national* baseline availability; and The Proposed Development has the potential to adversely and substantially** impact access to one or

	more allocated mineral site (in their entirety), placing their future use at risk.
Moderate	Consumption of one or more materials is between 6-10% by volume of the regional or national* baseline availability; and One allocated mineral site is substantially** sterilised by the Proposed Development rendering it inaccessible for future use.
Major	Consumption of one or more materials is >10% by volume of the regional or national* baseline availability; and More than one allocated mineral site is substantially** sterilised by the Proposed Development rendering it inaccessible for future use.

*a national baseline is used in the absence of regional construction material availability data for steel.

**justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed.

1.3.2 The IEMA Guidance (Ref 1) offers two methods to assess waste effects (Method W1 – Void Capacity and Method W2 – Landfill Diversion). For this assessment, Method W1 has been applied.

1.3.3 In a worst case, where landfill sensitivity is very high, a significant effect would occur at a magnitude of minor, which for the Proposed Development equates to non-hazardous and inert waste generation being more than 1% of landfill capacity and hazardous waste generation being more than 0.1% of landfill capacity.

1.3.4 The criteria used to assess the magnitude of impact for inert and non-hazardous and hazardous waste is provided within **Table 5** and **Table 6** respectively.

Table 5: Inert and Non-hazardous Waste – Magnitude of Impact

Magnitude of Impact	Criteria for Waste Magnitude of Impacts
No change	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the Proposed Development will reduce Expansive Study Area landfill capacity baseline# by <1%.
Minor	Waste generated by the Proposed Development will reduce Expansive Study Area landfill capacity baseline# by 1-5%.
Moderate	Waste generated by the Proposed Development will reduce Expansive Study Area landfill capacity baseline# by 6-10%.
Major	Waste generated by the Proposed Development will reduce Expansive Study Area landfill capacity baseline# by >10%.

 # - forecast as the worst-case scenario, during a defined construction and/or operational phase.

Table 6: Hazardous Waste – magnitude of impact

Magnitude of Impact	Criteria for Waste Magnitude of Impacts
No change	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the Proposed Development will reduce Expansive Study Area landfill capacity baseline# by <0.1%.
Minor	Waste generated by the Proposed Development will reduce Expansive Study Area landfill capacity baseline# by <0.1-0.5%.
Moderate	Waste generated by the Proposed Development will reduce Expansive Study Area landfill capacity baseline# by <0.5-1%.
Major	Waste generated by the Proposed Development will reduce Expansive Study Area landfill capacity baseline# by >1%.

 # forecast as the worst-case scenario, during a defined construction and/or operational phase.

1.4 Significance of Effects

1.4.1 **Table 7** describes the effect thresholds used in determining the significance of potential effects, whilst **Table 8** indicates which effects are deemed to be significant. Materials and waste have specific IEMA Guidance (Ref 1) and does not use the thresholds outlined in **Chapter 5: EIA Methodology and Consultation [EN010154/APP/6.1]**.

Table 7: Effect Thresholds

Sensitivity of receptor	Magnitude of Impact: No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Table 8: Significance of Effects

Effect	Materials	Waste
Neutral	Not Significant	Not Significant
Slight		
Moderate	Significant	Significant
Large		
Very Large		

1.5 Baseline Conditions

Existing Baseline

National and Regional Availability of Key Construction Materials

1.5.1 **Table 9** outlines the national requirement (providing an indication of availability) in 2023 for steel (Ref 2).

1.5.2 Regional data from the Mineral Products Association's Profile of the UK Mineral Products Industry (Ref 3) is presented in **Table 10**. Sales of construction materials are provided for the region in which the Proposed Development is located (East Midlands).

1.5.3 Potential recycled content for the main construction materials is outlined in **Table 11**. These good practice rates are derived from the Waste and

Resources Action Programme (WRAP) Designing Out Waste Tool for Civil Engineering (Ref 4).

Table 9 National Requirement for Steel

Material	National Availability (Million Tonnes, Year)	10% of National Availability (Million Tonnes, Year) *	Baseline Data Year	Data Description
Steel	15	1.5	2023	UK's requirement (Ref 2)

*10% of national availability noted as the point of significance for materials based on a sensitivity of low (see Table 1 and Table 7).

Table 10 Construction Material Sales by Region (Ref 3)

Construction Material	Regional (East Midlands) availability (million tonnes)	10% of regional (East Midlands) availability* (tonnes)
Crushed rock	30.6	3,600,000
Sand and gravel	6.1	610,000
Ready-mixed concrete (converted to million tonnes from m^3 using a density of 2.4t/m^3)	1.3	130,000

*10% of national availability noted as the point of significance for materials based on a sensitivity of low (see Table 1 and **Table 7**)

Table 11 Potential Recycled Content (Percentage by Weight) (Ref 4)

Material Type	Potential Recycled Content (% by Weight)
Concrete	16
Asphalt	25
Aggregates	50
Steel reinforcement	100
Structural steel	60

Landfill Capacity

1.5.4 The remaining landfill capacities at the end of 2023 for the non-hazardous and inert waste Expansive Study Area (East Midlands) and the hazardous waste Expansive Study Area (England) (Ref 5) are shown in **Table 12**.

1.5.5 Merchant landfills are operated for commercial purposes, accepting waste from construction projects and operating businesses. Merchant landfills are therefore considered to form the baseline. In contrast, restricted landfills are sites that deal with their own produced waste (i.e. not operating for commercial purposes). Therefore, additional capacity is excluded from the baseline. Some non-hazardous landfills have a Stable Non-Reactive Hazardous Waste (SNRHW) cell (e.g. for asbestos). SNRHW cells usually form only a small fraction of the overall capacity. Therefore, for assessment purposes non-hazardous landfills with SNRHW cells are considered in the same way as non-hazardous landfills.

Table 12 Landfill Capacity (end of 2023) in the East Midlands and England (Ref 5)

Landfill Type	East Midlands Landfill Capacity ('000s m^3)	England Landfill Capacity ('000s m^3)	Point of significance based on a sensitivity of "very high" (m^3)
Non-hazardous with SNRHW cell	16,069	Not applicable, assessment is completed at a regional level only	307,690 (1% of national landfill capacity)
Non-hazardous	14,700		
Inert	18,917		189,170 (1% of national landfill capacity)
Total non-hazardous and inert	**49,686**		**496,860 (1% of national landfill capacity)**
Hazardous merchant	Not applicable, assessment is completed at a national level only	9,680	9,680 (0.1% of national landfill capacity)

Waste Targets

1.5.6 Standard, good and best practice recovery rates by material are provided by WRAP (Ref 11). Recovery rates for key construction materials and other construction wastes relevant to the Proposed Development are provided in **Table 13.**

Table 13 Standard, Good and Best Practice Recovery Rates by Material

Material	Standard Practice Recovery (%)	Good Practice Recovery (%)	Best Practice Recovery (%)
Metals	95	100	100
Packaging	60	85	95
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical equipment	Limited information	70	95
Cement	Limited information	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited information, cannot be 100% since some hazardous waste (e.g. asbestos) must be landfilled.	

2. References

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Ref 2 UK Steel (2023). Steel UK's Key Statistics Guide May 2024. Available at: https://www.uksteel.org/reports-and-publications

Ref 3 Mineral Products Association (MPA) (2023). Profile of the UK Mineral Products Industry: 2023 Edition. Available at: https://www.mineralproducts.org/MPA/media/root/Publications/2023/Profile_of_the_UK_Mineral_Products_Industry_2023.pdf

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Ref 6 Environment Agency (2024). Environmental Permitting Regulations - Waste Sites. Available at: https://www.data.gov.uk/dataset/e2cc8101-d8b7-434d-a26a-9115061bb57c/environmental-permitting-regulations-waste-sites

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Ref 8 European Commission (2008). Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on Waste and repealing certain Directives (Waste Framework Directive). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008L0098-20180705

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Ref 10 DEFRA (2024). UK Statistics on waste. Available at: https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste#recovery-rate-from-non-hazardous-construction-and-demolition-cd-waste

Ref 11 WRAP (2007). Waste Recovery Quick Wins, Improving Recovery Rates Without Increasing Costs. No longer available online.