East Midlands Gateway
Phase 2 (EMG2)

Document [6.20]

ENVIRONMENTAL STATEMENT

Volume 1 Main Statement

Chapter 19

Climate Change

[January] 2025

19

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

SEGRO.COM/SLPEMG2

SEGRO

19. Climate Change

19.1. Introduction

19.1.1. This chapter of the ES assesses the **Scheme** in relation to the effects it would have upon and from climate change.

19.1.2. Climate change in the context of EIA can be considered broadly in the following parts:

- the effect of greenhouse gas emissions (GHGs) caused directly or indirectly by the **Scheme**, which contribute to climate change;
- the effect of changes in climate on the **Scheme**, which could affect it directly resulting in climate risk; and
- the effect of changes in climate on the **Scheme**, which could modify its other environmental impacts (i.e., in-combination climate change impacts).

19.1.3. This chapter is supported by the following appendices:

- Appendix 19a: Climate Change Policy Review
- Appendix 19b: Greenhouse Gas Assessment
- Appendix 19c: Climate Change Risk Assessment
- Appendix 19d: Energy Report

19.1.4. This assessment is based on the project description detailed within **Chapter 3: Project Description**, which includes details of the key components and construction processes, and cross references to the parameters plans Documents 2.5 and MCO 2.5), and illustrative masterplans (Document 2.6 and MCO 2.6) provided as **Figures [xx] and [xx]** to the ES.

19.2. Scope and Methodology of the Assessment

Consultation

19.2.1. In August 2024 the Applicant submitted a Scoping Report to the Planning Inspectorate (PINS) which defined the likely significant effects of the development on the environment, the studies necessary to assess them, and the level of detail required to enable a decision to be made.

19.2.2. Following consultation with the appropriate statutory bodies, PINS (on behalf of the Secretary of State) adopted a Scoping Opinion on 24 September 2024. Key issues raised during the scoping process specific to climate change are listed in **Table 19.1** together with details of how these issues have been addressed within this chapter of the ES.

Table 19.1: Summary of scoping responses

Comment	How and where considered in the ES
Climate change resilience: The Scoping Report states that a risk assessment of the impact of climate change on the **Scheme** will be undertaken but does not specify which other aspect assessments this will incorporate. The Inspectorate considered that the ES should include an assessment of the resilience of the **Scheme** to climate change, including how the design would be adapted to take account of the projected impacts of climate change (for both construction and operation). This should draw on the Flood Risk and Drainage ES chapter and the Flood Risk Assessment.	The ES includes an assessment of the resilience of the **Scheme** to climate change in **Appendix 19c**: Climate Change Risk Assessment. The outcomes of the Climate Change Risk Assessment (CCRA) are set out in Section 19.7. The risk of future climate change with regard to flood risk is set out in **Chapter 13**: Flood Risk and Drainage, where appropriate climate change allowances have been applied in the assessment. As set out in paragraph 19.5.1 below, owing to the short construction programme (see **Chapter 3**), variations in climatic parameters would be minimal compared to the current day baseline and therefore no significant effects are anticipated, as such no additional mitigation other than best practice construction industry measures are proposed.
Residual impacts: The Scoping Report states that the chapter will 'seek to quantify their impacts where feasible and assess their impacts commensurate to the 'outline' nature of the proposals'. The Applicant should be aware that the term 'outline' is not directly applicable to applications made under the Planning Act 2008. The ES should assess all impacts of the Scheme where significant effects are likely to occur. Where uncertainty exists, the Applicant may choose to apply for flexibility in any DCO application. Please also refer to Section 2 of this Scoping Opinion for the Inspectorate's comments in relation to flexibility and the 'Rochdale Envelope' with reference to a worst-case assessment.	Section 19.7 sets out any residual effects, taking into account the Parameters Plan and **Scheme** description as set out in **Chapter 3**. All climate change impacts of the **Scheme** where significant effects are likely to occur have been assessed in this chapter.
Design and climate change resilience: The ES should demonstrate how resilience to future climate change has been addressed within the design, including in the provision and location of water attenuation features.	Section 19.6 below sets out climate resilience mitigation measures adopted as part of the **Scheme**. Measures relating to flood risk and drainage, such as provision and location of water attenuation features, are set out in **Chapter 13**: Flood Risk and Drainage, where appropriate.

Study Area

19.2.3. GHG emissions have a global effect rather than directly affecting any specific local receptor. The impact of GHG emissions occurring due to the **Scheme** on the global atmospheric concentration of the relevant GHGs, expressed in CO_2-equivalents (CO_2e), is therefore considered within this assessment. The climate change study area is defined as the order limits alongside the global atmosphere, based on established Institute for Environmental Management and Assessment (IEMA) guidance (IEMA, 2022).

19.2.4. The climate change risk study area is defined as the order limits and the 25 km grid cell within which the order limits are located, based on the UK Climate Projections 2018 (UKCP18) probabilistic projections (Met Office Hadley Centre (MOHC), 2024).

19.2.5. With regards to the assessment of cumulative impacts, all developments that emit, avoid or sequester GHGs have the potential to impact the atmospheric mass of GHGs as a receptor, and so may have a cumulative impact on climate change and upon the development. Consequently, cumulative impacts due to other specific local development projects are not considered individually but are taken into account when considering the impact of the **Scheme** by defining the atmospheric mass of GHGs as a high sensitivity receptor. There is therefore no specific cumulative assessment study area for climate change.

19.2.6. Assessment of in-combination climate change impacts have been included within individual environmental topic chapters where relevant, i.e. where climatic changes could modify the **Scheme**'s other environmental impacts. As such, the study area for in-combination climate change impacts is defined in individual environmental topic chapters.

Baseline Methodology

19.2.7. The baseline methodology is divided between the assessment of GHG emissions and climate resilience and adaptation.

19.2.8. Desk studies were undertaken to determine the GHG emissions resultant from the **Scheme**, in addition to the impact of climate change on the **Scheme**.

19.2.9. GHG emissions affect global atmospheric GHG concentrations (and fluxes with land and ocean) and are not localised to a site-level baseline. The current and future baseline conditions relevant to the **Scheme** with regards to the impact of GHGs therefore comprise the following:

- the business-as-usual GHG emissions from comparable buildings, building uses (i.e. offices, logistics facilities (use class B8) and general industrial uses (use class B2)) and infrastructure;
- the business-as-usual GHG emissions from road users using the highways network, for the **Highways Works** elements of the **Scheme**; and
- any existing GHG sources or sinks from current land use of the **Scheme's** site itself that would be impacted by the **Scheme**.

19.2.10. The business-as-usual baseline has been established through the use of benchmarks, traffic modelling data and the review of relevant existing policy and legislation. Existing GHG sources or sinks have been established through desk review of existing land use and informed by site-

specific land use and ground condition surveys (see Chapter 15: Agriculture and Soils and Chapter 14: Ground Conditions for more information).

19.2.11. To determine the baseline climate environment to inform both the CCRA and assessment of in-combination climate impacts (presented in individual topic chapters), onshore climate conditions have been sourced from the Met Office observed data for Sutton Bonington climate station (Met Office, 2020). The observational data from Sutton Bonington climate station has been collected and averaged over 30 years from 1981 to 2010 and reviewed against regional observational data averaged over the same reporting period (Met Office, 2020). The future climate baseline has been informed by the Met Office UKCP18 dataset (MOHC, 2024).

Assessment Criteria and Assignment of Significance

19.2.12. The climate change impact assessment has followed the following guidance documents in its approach to assessment and assignment of significance:

- IEMA Guidance on Climate Change Adaptation and Resilience (IEMA, 2020);
- IEMA Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022); and
- Design Manual for Roads and Bridges (DMRB) LA 114: Climate (Highways England, 2021).

19.2.13. The criteria for determining the significance of effects have been divided into two categories:

- Assessment of the significance of the effect of the **Scheme** on climate change (GHG assessment); and
- Assessment of the significance of the effect from climate changes on the **Scheme** (CCRA).

19.2.14. The assessment methodology for each of these categories is set out below, with the impact assessment criteria for the GHG assessment defined at paragraphs 19.2.16 to 19.2.36, and the impact assessment criteria for the CCRA defined at paragraphs 19.2.37 to 19.2.45.

19.2.15. As set out in paragraph 19.2.6 above, in-combination climate change impacts have been assessed in individual topic chapters, where relevant. As such, there is no specific assessment methodology presented in this chapter.

GHG Emissions Assessment Methodology

19.2.16. GHG emissions have been estimated by applying published emissions factors to activities in the baseline and to those required for the **Scheme**. The emissions factors relate to a given level of activity, or amount of fuel, energy or materials used, to the mass of GHGs released as a consequence. The GHGs considered in this assessment are those in the 'Kyoto basket' of global warming gases expressed as their CO_2-equivalent global warming potential (GWP). This is denoted by CO_2e units in emissions factors and calculation results. GWPs used are typically the 100-year factors in the IPCC Fifth Assessment Report (IPCC, 2013) or as otherwise defined for national reporting under the United Nations Framework Convention on Climate Change (UNFCCC).

19.2.17. Additional guidance used for the quantification of GHG emissions includes:

- UK Government GHG Conversion Factors for Company Reporting (Department for Energy Security and Net Zero (DESNZ) and Department for Environment, Food and Rural Affairs (Defra), 2024);
- Royal Institute for Chartered Surveyors (RICS) Professional Standard: Whole Life Carbon Assessment for the Built Environment (2nd Edition) (RICS, 2023); and
- PAS 2080 – Carbon Management in Buildings and Infrastructure (The British Standards Institution (BSI), 2023); and
- the Greenhouse Gas Protocol suite of documents (WRI and WBCSD, 2004).

19.2.18. GHG emissions caused by an activity are often categorised into 'scope 1', 'scope 2' or 'scope 3' emissions, following the guidance of the WRI and the WBCSD Greenhouse Gas Protocol suite of guidance documents (WRI and WBCSD, 2004):

- scope 1 emissions: direct GHG emissions from sources owned or controlled by the company (e.g., from combustion of fuel at an installation);
- scope 2 emissions: caused indirectly by consumption of purchased energy (e.g., from generating electricity supplied through the UK Grid to an installation); and
- scope 3 emissions: all other indirect emissions occurring as a consequence of the activities of the company (e.g., in the upstream extraction, processing and transport of materials consumed or the use of sold products or services).

19.2.19. This assessment has sought to include emissions from all three scopes, where this is material and reasonably possible from the information and emissions factors available, to capture the impacts attributable most completely to the **Scheme**. These emissions are not separated out by defined scopes (scopes 1, 2 or 3) in the assessment.

19.2.20. The assessment has considered the GHG emissions arising from the **Scheme**, as required by IEMA (2022) and Highways England (2021) guidance. Emissions resulting from the manufacturing and construction, and operations and maintenance of the **Scheme** (including the **EMG2 Main Site**, **Highways Works**, and **EMG1 Works**) have been calculated via a range of methodologies. These include published benchmark carbon intensities, life cycle analysis (LCA) literature, analysis of SEGRO development whole-life carbon (WLC) assessments, and the application of material or fuel emission intensities to material or fuel quantities.

19.2.21. Decommissioning of the **Scheme** has not been assessed as the **Scheme** is intended to be a permanent development, and consideration for decommissioning at this stage would be hypothetical in nature, as stated within **Chapter 3** (Proposed Development). Further, there would likely be negligible end-of-life emissions associated with plant use on site, disassembly activities and material transport, given anticipated decarbonisation of the construction industry in line with UK net zero goals. Materials used to construct the **Scheme** will be recycled at the end of their lifetime wherever possible, through the specification of recyclable and recycled materials for the buildings and infrastructure. As such, when disposing of materials, recycling is the preferred solution. This not only prevents materials from being sent to landfill, but also reduces the need for extraction of primary materials. Material which cannot be recycled might be incinerated or used to produce energy from waste. Emissions associated with the disposal

of materials at the end of the lifetime is considered to be negligible and may even result in future avoided emissions. The impact of decommissioning is therefore not assessed further.

19.2.22. Some construction-stage GHG emissions associated with the manufacturing of materials may occur outside the territorial boundary of the UK and hence outside the scope of the UK's national carbon budget. However, in recognition of the climate change effect of GHG emissions (wherever occurring) and the need, as identified in national policy, to avoid 'carbon leakage' overseas when reducing UK emissions, the full life-cycle GHG emissions of the **Scheme** have been evaluated where possible when determining the significance of effects.

19.2.23. Where feasible, emissions have been calculated for both a 'pre-mitigation' (potential impacts, Section 19.5) and 'post-mitigation' (residual effects, Section 19.7) scenario. Pre-mitigation emissions have been calculated based on 'do-minimum' design measures, complying only with the minimum legislative requirements. Post-mitigation emissions have accounted for the mitigation measures adopted as part of the **Scheme** (detailed at Section 19.6), and have quantified the impact of these mitigation measures as a percentage reduction against the pre-mitigation emissions scenario, where feasible.

19.2.24. A proportional approach to identification and calculation of GHG emissions sources has been applied, in accordance with Highways England (2021).

19.2.25. Further details regarding the GHG emissions calculation methodology can be found in **Appendix 19b**: Greenhouse Gas Assessment.

Receptor Sensitivity / Value

19.2.26. GHG emissions have a global effect rather than directly affecting any specific local receptor to which a level of sensitivity can be assigned. The global atmospheric mass of the relevant GHGs and consequent warming potential, expressed in CO_2e, has therefore been treated as a single receptor of **high sensitivity** (given the importance of the global climate as a receptor), as defined within IEMA (2022).

19.2.27. Highways England (2021) does not prescribe a methodology to determine the sensitivity of the receptor, and as such IEMA (2022) guidance has been used.

Significance of Effect

19.2.28. The significance of the effect on climate change has been determined by taking into account the sensitivity of the receptor and the magnitude of the impact.

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

19.2.30. Assessment guidance for GHG emissions (IEMA, 2022) describes five levels of significance for emissions resulting from a development, each based on whether the GHG emission impact of the development will support or undermine a science-based 1.5°C compatible trajectory towards net zero. To aid in considering whether effects are significant, the guidance recommends that GHG emissions should be contextualised against pre-determined carbon budgets, or applicable existing and emerging policy and performance standards where a budget

is not available. It is a matter of professional judgement to integrate these sources of evidence and evaluate them in the context of significance.

19.2.31. Taking the guidance into account, the following factors have been considered in contextualising the **Scheme**'s GHG emissions:

- the magnitude of gross and net GHG emissions as a percentage of national carbon budgets given the national significance of the **Scheme**;
- the consideration of any increase/reduction in absolute GHG emissions of the **Scheme** compared with current baseline scenarios, including projections for future changes in those baselines; and
- whether the **Scheme** contributes to, and is in line with, the UK's policy for GHG emissions reductions, where these are consistent with science-based commitments to limit global climate change to an internationally-agreed level (as determined by the UK's NDC to the Paris Agreement (former Department for Business, Energy and Industrial Strategy (BEIS), 2022)).

19.2.32. Effects from GHG emissions are described within this chapter as adverse, negligible or beneficial based on the following definitions, as stated within the IEMA guidance (IEMA, 2022):

- Major Adverse: the scheme's GHG impacts would not be compatible with the UK's net zero trajectory. Its GHG impacts can not be mitigated, or would be compliant only with do-minimum standards set through regulation. The scheme may not provide further emissions reductions required by existing local and national policy for projects of this type.
- Moderate Adverse: the scheme's GHG impacts would not be compatible with the UK's net zero trajectory. Its GHG impacts could be partially mitigated and may partially meet the applicable existing and emerging policy documents, however it would not fully contribute to decarbonisation in line with local and national policy goal for projects of this type.
- Minor Adverse: the scheme's GHG impacts would be compatible with the UK's 1.5°C trajectory and would comply with up-to-date policy and 'good practice' emissions reduction measures. The scheme would fully comply with, or exceed, measures necessary to achieve the UK's net zero trajectory.
- Negligible: the scheme would achieve emissions mitigation that goes substantially beyond existing and emerging policy compatible with the 1.5°C trajectory and would have minimal emissions. The scheme would be fully consistent with good practice design standards for projects of this type.
- Beneficial: the scheme would result in emissions reductions from the atmosphere, whether directly or indirectly, compared to the without-project baseline. As such, its net GHG impacts would be below zero. The **scheme** would substantially exceed net zero requirements.

19.2.33. Major and moderate adverse effects and beneficial effects are significant in EIA terms. Minor adverse and negligible effects are not considered to be significant in EIA terms.

19.2.34. GHG emissions associated with a project are often reported as a whole life figure (net emissions) that takes account of all life stages. The net whole life figure is the key element for determining the **Scheme**'s whole life impact on climate change. However, it is noted in the IEMA guidance (2022) that due to the nature of GHG emissions, it is good practice to include a section that reports on the whole life GHG emissions associated with a project, alongside the sections that assess construction, operation, and decommissioning effects in isolation.

19.2.35. Highways England (2021) guidance sets out that the significance of effect of GHG emissions should be undertaken in comparison with the relevant UK carbon budgets. It also notes that benchmarking of project performance should be undertaken, by comparing normalised GHG emissions to other highways projects. Significant effects should be reported where increases in GHG emissions will have a material impact on the ability of the UK Government to meet its carbon reduction targets.

19.2.36. The Highways England (2021) guidance has been considered in the contextualisation of emissions in the assessment of significance. However, the IEMA (2022) definitions of significance, set out in paragraph 19.2.32 above, have been used to establish the significance of GHG effects, given their more rigorous definitions.

CCRA Methodology

19.2.37. Potential climatic conditions during the 2040-2069 and 2070-2099 time periods for the **Scheme** have been considered based on the MOHC UKCP18 probabilistic projections (MOHC, 2024). Projections for the global emissions RCP 8.5 have been used as a worst case approach, as this is a high emissions scenario assuming 'business as usual' growth globally with little additional mitigation to combat climate change.

19.2.38. Further detail of the approach and data input is given in Appendix 19c: Climate Change Risk Assessment.

19.2.39. An initial screening exercise has been undertaken, which has identified the relevant climate change risks on the **Scheme**. A high level assessment of such risks has been undertaken, considering the hazard, the likelihood of the effect on the **Scheme** and its users, and the consequence of that effect.

Impact Assessment Criteria

19.2.40. IEMA guidance (IEMA, 2020) defines climate change resilience as the *'ability to respond to changes in climate. If a receptor or project has good climate change resilience, it is able to respond to the changes in climate in a way that ensures it retains much of its original function and form. A receptor or project that has poor climate change resilience will lose much of its original function or form as the climate changes'*.

19.2.41. The CCRA differs from many other EIA topics in that it considers how the resilience of a development is affected by an external factor (climate change) and not specifically how potential environmental receptors are affected by a development's impacts. Consequentially, the climate change risk assessment cannot easily be assigned significance with respect to the severity of impacts in the same way as for the other topics. Instead, a risk-analysis based approach has been used for the assessment.

19.2.42. In accordance with IEMA (2020) and Highways England (2021) guidance, a risk assessment has been undertaken, considering the hazard, the likelihood of the effect on the **Scheme** and its users, and the consequence of that effect.

19.2.43. Each element of the risk assessment (likelihood and consequence) has been evaluated following the definitions in Table 19.2 and Table 19.3 below (adapted from Highways England (2021)). An assessment of significance has been subsequently undertaken according to Table 19.4 below (adapted from Highways England (2021)).

19.2.44. Where relevant, the likelihood and consequence definitions provided within the Highways England (2021) guidance have been adapted to make them suitable for the receptors identified. For example, levels of consequence for the **EMG2 Main Site** have been classified according to disruption to site operations, rather than disruption to a strategic route.

19.2.45. As set out in paragraph 19.2.37, climate projections in the mid- to late-century have been used to capture the range of climatic changes over the project lifetime, which aligns with the 60 year assessment period as recommended by Highways England (2021) guidance.

Table 19.2: Likelihood Category Definitions

Likelihood Category	Description (Probability and Frequency of Occurrence)
Very high	The event occurs multiple times during the lifetime of the project (60 years) e.g. approximately annually, typically 60 events.
High	The event occurs several times during the lifetime of the project (60 years) e.g. approximately once every five years, typically 12 events.
Medium	The event occurs limited times during the lifetime of the project (60 years) e.g. approximately once every 15 years, typically 4 events.
Low	The event occurs during the lifetime of the project (60 years) e.g. once in 60 years.
Very low	The event can occur once during the lifetime of the project (60 years).

Table 19.3: Consequence Category Definitions

Consequence of Impact	Description
Very large adverse	Operation – national level (or greater) disruption to strategic route(s) lasting more than 1 week.
Large adverse	Operation – national level disruption to strategic route(s) lasting more than 1 day but less than 1 week or regional level disruption to strategic route(s) lasting more than 1 week.
Moderate adverse	Operation – regional level disruption to strategic route(s) lasting more than 1 day but less than 1 week.
Minor adverse	Operation – regional level disruption to strategic route(s) lasting less than 1 day.
Negligible	Operation – disruption to an isolated section of a strategic route lasting less than 1 day.

Table 19.4: Significance Matrix

		Measure of Likelihood				
		Very low	**Low**	**Medium**	**High**	**Very high**
Measure of Consequence	**Very large**	NS	**S**	**S**	**S**	**S**
	Large	NS	NS	**S**	**S**	**S**
	Moderate	NS	NS	**S**	**S**	**S**
	Minor	NS	NS	NS	NS	NS
	Negligible	NS	NS	NS	NS	NS

NS: Not significant in EIA terms, S: Significant in EIA terms.

Limitations of the Assessment

19.2.46. When assessing climate risks, uncertainty arises from both modelling uncertainty and natural variability in the potential magnitude of future changes in climate. Therefore, a high magnitude of change scenario and the high end of probabilistic projections have been used, to provide a precautionary worst case approach. This is further discussed in Appendix 19: Climate Change Risk Assessment.

19.2.47. Some of the construction stage GHG emissions associated with the manufacturing of components may occur outside the territorial boundary of the UK and hence outside the scope of the UK's national carbon budget, policy and governance. However, in recognition of the climate change effect of GHG emissions (wherever they occur) and the need to avoid 'carbon leakage' overseas when reducing UK emissions, emissions associated with the construction stage have been presented within the assessment and quantification of GHG emissions as part of the **Scheme**.

19.2.48. When considering the assessment of emissions resultant from the **Scheme**, due to the early stage in the development design, the design of the **EMG2 Main Site** and **EMG1 Works** has not yet been fully specified. Thus, there is a degree of uncertainty regarding the construction stage GHG emissions resulting from the manufacturing and construction of these elements of the **Scheme**.

19.2.49. The assessment has therefore sought to limit the impact this may have by assessing a maximum design scenario (which will result in a conservative or worst case assessment). The maximum design scenario is based on the parameters plan set out in **Chapter 3**: Project Description. The following items comprise the main assumptions made for the maximum design scenario for the **Scheme**:

- An estimated bill of materials for the buildings elements (i.e. warehousing and office space) of the **EMG2 Main Site** and the **EMG1 Works** was developed based on recently constructed similar developments by SEGRO. Though exact material specifications will be subject to change informed by a range of factors (such as availability of the material in proximity to the **Scheme** site), SEGRO are committed to a comparable level of low carbon design, as a minimum, for the **Scheme,** and are committed to Net Zero across all business operations by 2050 at the latest, including emissions from development embodied carbon. The information provided is therefore deemed to suitably capture the material types and quantities to be used at the **Scheme**.

- An estimated bill of materials for the internal road network was provided by the project team. The information provided was deemed to suitably capture the material types and quantities to be used for the **Scheme**.
- Emissions associated with the construction plant during the construction-phase was calculated using a plant schedule provided by the project team, scaled by the construction programme listed in **Chapter 3**. It is considered that this is representative of the construction work to be undertaken for the **Scheme**.
- Emissions associated with operational traffic movements were informed by detailed traffic modelling. The assumptions underlying this modelling can be found in **Chapter 6: Traffic and Transport**.

19.2.50. At this consultation stage, some elements of the **Scheme** have not been quantitatively assessed owing to the current lack of available information. This includes:

- Construction stage emissions associated with the manufacture of specific infrastructure elements, including drainage, the bridge associated with the J24 **I**mprovements and other required civils works.
- Construction stage emissions associated with transport of materials to site.
- Operation stage emissions associated with maintenance and refurbishment of the buildings and infrastructure.
- Operation stage emissions associated with vehicles using the **Highways Works**.

19.2.51. [The assessment will be updated before submission of the application to include the above emissions sources. As such, the emissions totals presented in sections 19.5 19.7 and 19.9 are subject to further review].

19.2.52. The above uncertainties are integral to the assessment of climate change effects, but a precautionary approach has been taken as far as practicable to provide a reasonable worst case assessment. On the basis of the above, it is considered that limitations to the assessment have been minimised and that the results provide a robust estimate of the effects of the **Scheme**.

19.3. Policy, Guidance and Legislative Context

19.3.1. A summary of relevant policy, guidance and legislation is given in this section. Full references and detail are provided in **Appendix 19a**: Climate Change Policy Review.

National Planning Policy and Legislative Context

Climate Change Act 2008

19.3.2. The Climate Change Act 2008 as amended created a framework for setting a series of interim national carbon budgets and plans for national adaptation to climate risks. The Act requires the UK Government to set carbon budgets[1] for the whole of the UK.

19.3.3. At present, the Third, Fourth, Fifth and Sixth Carbon Budgets, set through the Carbon Budget Orders 2009, 2011, 2016 and 2021 are 2.54 giga tonnes carbon dioxide equivalent ($GtCO_2e$) for 2018-2022, 1.95 $GtCO_2e$ for 2021-2027, 1.73 $GtCO_2e$ for 2028-2032, and 0.97 $GtCO_2e$ for 2033-2037 respectively. The Sixth Carbon Budget is the first Carbon Budget that is consistent with the UK's net zero target, requiring a 78% reduction in GHG emissions by 2035 from 1990 levels.

19.3.4. The Act also established a requirement for the UK Government to publish a CCRA every five years to assess the risks for the UK from the current and predicted impacts of climate change.

19.3.5. The UK's Nationally Determined Contribution (NDC) (BEIS, 2022) under the Paris Agreement to the United Nations Framework Convention on Climate Change (UNFCCC) commits the UK to reducing economy-wide GHG emissions by at least 68% by 2030, compared to 1990 levels. At the most recent Conference of the Parties (COP), the UK government signalled its intention to increase the ambition of the UK's NDC to an 81% reduction by 2035.

National Networks National Policy Statement

19.3.6. The National Networks National Policy Statement (NPS) (Department for Transport, 2024) sets out the UK Government's policy for the delivery of nationally significant road and rail networks. It sets out requirements for both climate change adaptation and climate change mitigation, including:

- *"Applicants must consider the direct (e.g., flooding of road or rail infrastructure) and indirect (e.g., flooding of other parts of the road or rail network) impacts of climate change when planning the location, design, build, operation and maintenance"* (paragraph 4.39).
- Paragraphs 4.40-4.42 requires that the latest UK Climate Projections and associated research and expert guidance (such as the Environment Agency's Climate Change Allowances for Floor Risk Assessments) should be used to identify and assess mitigation or adaptation measures.
- Paragraphs 5.31 to 5.34 require the applicant to assess GHG emissions across the lifecycle of a project. *"All proposals for national network infrastructure projects should include a Whole Life Carbon Assessment at critical stages in the project lifecycle."*
- Paragraph 5.35 sets out that *"a carbon management plan should be produced as part of the Development Consent Order submission"*, which should include a WLC assessment, details of the mitigation measures taken to reduce GHG impacts using the carbon reduction hierarchy, and the level of any residual emissions in the context of relevant statutory carbon budgets.

[1] A carbon budget places restrictions on the total amount of GHGs that can be emitted. The budget balances the input of CO_2 to the atmosphere by emissions from human activities, by the storage of carbon (i.e. in carbon reservoirs on land or in the ocean).

19.3.7. Further detail of the National Networks National Policy Statement is presented in **Appendix 19a**.

National Planning Policy Framework (NPPF)

19.3.8. The NPPF (2024) highlights the importance of the UK's transition to a low carbon future in a changing climate, and stresses the overarching objective to achieve sustainable development.

19.3.9. Paragraph 161 states that the planning system should *"shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience"* and *"encourage the reuse of existing resources"*.

19.3.10. Paragraph 164 states that new development should *"avoid increased vulnerability to the range of impacts arising from climate change… care should be taken to ensure that risks can be managed through suitable adaptation measures"*. Further, new development should be planned in ways that *"help to reduce greenhouse gas emissions, such as through its location, orientation and design"*.

19.3.11. Paragraph 165 supports the deployment of renewable and low carbon energy sources, where opportunities should be identified for development *"to draw its energy supply from decentralised, renewable or low carbon energy supply systems"*.

National Climate Change Policy and Strategy

19.3.12. National climate change policy and strategy (as detailed within Appendix 19a) provides additional information with regards to the UK's approach to reach net zero by 2050. Key drivers detailed include the decarbonisation of UK electricity supply through the increased supply of renewable and low carbon energy, improved building energy efficiency, and decarbonisation of the built environment through material substitution and increased resource efficiency.

19.3.13. The Energy White Paper: Powering our Net Zero Future (BEIS, 2020) aims to set energy-related measures in a long-term strategic vision, working towards the net zero emissions target for 2050. It establishes a shift from fossil fuels to cleaner energy in terms of power, buildings and industry, whilst creating jobs and growing the economy. Focusing on electricity is key for the transition away from fossil fuels and decarbonising the economy by 2050, alongside improvements to energy efficiency. Further, improvements to manufacturing methods of construction materials is a focus point, specifically the decarbonisation of the manufacturing industry.

19.3.14. The National Infrastructure Strategy focuses on the investment and delivery of infrastructure, which is fundamental to delivering net zero emissions by 2050 (HM Treasury, 2020). The strategy sets out the UK Government's plans to deliver on this target, decarbonising the economy and adapting to climate change, through reforms in power, transport and buildings.

19.3.15. The Net Zero Strategy: Build Back Greener (BEIS, 2021a) sets out the UK's long term plans to meet net zero emissions by 2050, promoting the transition to low carbon buildings by focusing on the phase out of natural gas, increased energy efficiency, and improved resource efficiency and material substitution.

19.3.16. The Industrial Decarbonisation Strategy (BEIS, 2021c) covers the full range of UK industry sectors, including construction, and sets out the ambition to decarbonise industry in line with the UK's net zero by 2050 target. The Strategy supports and encourages resource efficiency and material substitution and supports circular economy principles within construction, including reuse, repair, recycling and reducing the quantity of materials used within manufacturing.

19.3.17. The Heat and Buildings Strategy (BEIS, 2021b) sets out how construction and improvement of new and existing buildings can follow in line with a low-carbon future, and to achieve the elimination of "virtually all emissions arising from heating, cooling and energy use in our buildings". The Strategy highlights that to achieve this, there must be improvements in the thermal efficiency of buildings, internal heat and cooling distribution systems, energy storage and smart technologies to control and monitoring of energy usage.

19.3.18. The Sixth Carbon Budget: the UK's Path to Net Zero (Climate Change Committee, 2020) provides advice on the volume of emissions that can be emitted during the period 2033-2037, and has an accompanying policy report, which sets out changes to policy (particularly during the 2020s) that could achieve the emissions targets. Sector briefings for buildings, and manufacturing and construction outline considerations when reducing sectoral emissions, which include: the efficient use of energy and resources, material substitution (i.e. switching to low embodied carbon materials), use of low carbon solutions, and net zero operational buildings. Developments should also have climate resilience in mind to account for the impacts of future climate change.

Local Policy

North West Leicestershire Local Plan 2011-2031

19.3.19. Chapter 12 of the North West Leicestershire Local Plan 2011-2031 (North West Leicestershire District Council (NWLDC), 2021) states its intention to prepare for, limit and adapt to climate change by *"ensuring a sustainable pattern of development"* and *"ensuring that new developments incorporate appropriate adaptation and mitigation for climate change"*. The Plan outlines several examples of climate change mitigation and adaptation measures to be included within development design. The supporting text at Paragraph 6.25 for Policy D1 (Design of New Development) include *"incorporating small scale renewables into the design of new developments"*, *"planting, shading and advanced glazing systems to reduce solar heat gain during the summer"*, and *"incorporating EV charging points where viable and appropriate to do so"*.

Draft North West Leicestershire Local Plan

19.3.20. The Draft North West Leicestershire Local Plan (Regulation 18 consultation) sets out draft policies to replace the existing Local Plan (NWLDC, 2024). It should be noted that the content of the draft plan does not constitute current policy. The draft Plan includes requirements for developments to "*achieve energy efficiency targets in line with the latest standards*", "*demonstrate that measures have been taken to minimise energy consumption by following the steps in the energy hierarchy*", "*demonstrate that measures have been taken to reduce lifecycle carbon emissions"* and "*renewable energy generation should be maximised as much as possible onsite".*

North West Leicestershire District Council Climate Emergency

19.3.21. NWLDC declared a climate emergency in 2019, prompting the publication of their Zero Carbon Roadmap (NWLDC, 2019) and Action Plan (NWLDC, 2020) which go further than local policy and outline the ways in which NWLDC could achieve Zero Carbon by 2030 (Council emissions only), and Zero Carbon for the district as a whole by 2050. While the **Scheme** aligns with the actions recommended within the roadmap and action plan, it is important to note that they do not constitute official guidance or policy. Further detail is provided within Appendix 19a.

Guidance and Recommendations

19.3.22. The main guidance used for the assessment of GHG emissions in EIA is the IEMA guide *'Assessing Greenhouse Gas Emissions and Evaluating their Significance'* (IEMA, 2022). The DMRB guidance document LA 114: Climate (Highways England, 2021) has also been used for the assessment of GHG emissions.

19.3.23. The main guidance documents with regard to climate risk and resilience assessment within the context of EIA is the *'Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation'* (IEMA, 2020) and the DMRB guidance document LA 114: Climate (Highways England, 2021).

19.3.24. Additional guidance used for the quantification of GHG emissions includes:

- The Greenhouse Gas Protocol suite of documents (World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), 2004);
- UK Government GHG Conversion Factors for Company Reporting (DESNZ and Defra, 2024);
- Royal Institute for Chartered Surveyors (RICS) Professional Standard: Whole Life Carbon Assessment for the Built Environment (2nd Edition) (RICS, 2023); and
- PAS 2080 – Carbon Management in Buildings and Infrastructure (The British Standards Institution (BSI), 2023).

19.4. Baseline Conditions

Current Baseline

19.4.1. With regard to current climate, the baseline is the local and regional climate and resulting weather patterns recorded in Met Office data. This is in the context, however, of wider trends in global climatic changes affecting the UK climate, which at their present rates may be considered part of the known baseline. The current climate baseline is set out in **Appendix 19c** and summarised below.

19.4.2. The Midlands region experiences a temperate climate, with annual average maximum and minimum temperatures of 13.9°C and 6.1°C respectively, recorded at Sutton Bonington climate station (Met Office, 2020). Over the 1981-2010 baseline period, average maximum temperatures reached 21.7°C in July and minimum temperatures fell to an average of 1.3°C in February. This is consistent with regional climate patterns for the Midlands, though temperatures recorded at Sutton Bonington climate station are slightly warmer than the wider

region. In recent years, temperature fluctuations have resulted in extreme high temperatures in the summer months, including in July 2022 when a temperature of 40.2°C was recorded in Pitsford, Northants (Met Office, 2024a).

19.4.3. Annual average precipitation recorded at Sutton Bonington climate station is lower than that reported regionally and nationally, at 620.2 mm a year (compared to 792.7 mm in the Midlands region and 1,142.0 mm across the UK). However, recent extreme weather events have resulted in very large amounts of rainfall in the Midlands region, with 186 mm of rain falling in Leicestershire in September 2024 (Met Office, 2024b).

19.4.4. Annual average wind speeds at Sutton Bonington are lower than the wider Midlands region and the UK as a whole, at 6.89 kn (compared to 7.97 kn in the Midlands region and 9.37 kn across the UK).

19.4.5. Overall, the **Scheme** is located in an area with a warm, relatively dry and sheltered climate compared to the UK as a whole. Rainfall is consistently lower throughout the year than the UK average.

19.4.6. With regard to GHG emissions, the current baseline is the current use of the site and any associated GHG emissions or removals. This includes:

- **EMG2 Main Site**: agricultural land divided by hedgerows with no previous development.
- **Highways Works**: existing road network, public footpaths, and land adjacent to the road network
- **EMG1 Works**: Plot 16 is located in an area of undeveloped land. The remainder of the **EMG1 Works** site is existing development, including hardstanding, rail freight interchange and public transport interchange area. No additional capacity for train movements is proposed at the rail freight interchange beyond the 16 trains per day approved through the EMG1 **DCO**, as such the proposed **EMG1 Works** will not result in additional emissions associated with train movements beyond those considered as part of the baseline.

Future Baseline

19.4.7. With regard to future climate, the future baseline can be considered using the UK Climate Projections 2018 (UKCP18) published by the Met Office Hadley Centre, which encompass the potential climatic outcomes in the UK from a range of potential global emissions and climate change scenarios. The change in baseline over time for climate change is set out in Appendix 19c and summarised below.

19.4.8. Climate change has been identified as a process that is already taking place in the UK, in both academic research and all legislation and policy referenced in Appendix 19a. In the near future, roughly within the next few years to a decade, variations in average temperature and precipitation are likely to be the most visible in terms of year-to-year changes in climate. In subsequent decades, within the operating lifetime of the **Scheme**, anthropogenic climatic changes are expected to become more apparent.

19.4.9. In summary, the data presented in Appendix 19c shows increased intensity in seasonal precipitation trends: precipitation is predicted to increase during the wettest season and decrease during the driest season. Temperatures are anticipated to increase across the year, both during the coldest and hottest seasons and months. Additionally, humidity is anticipated to increase. These trends will continue and amplify towards the end of the century.

19.4.10. With regard to GHG emissions, the future baseline trend is towards the decarbonisation of the built environment and transport sector. This is based within the context of the 'climate emergency' as declared by the UK Government, and the reaffirmed commitments to the Paris Agreement targets within the recent Conference of Parties (COP29). Further, under the Climate Change Act 2008 as amended, the UK is committed to achieving net zero emissions nationally by 2050.

19.4.11. The future baseline encompasses changes in the baseline carbon intensity of factors such as electricity, heating fuel, transport fuel or energy and the embodied carbon in construction materials. It also encompasses changes in baseline road user emissions. All of these are expected to decrease over time in line with national decarbonisation policy goals. For the purpose of this assessment, present-day values have been used (appropriately representative of the construction period and initial year of operation) to provide a conservative assessment. Decarbonisation scenarios have been assessed qualitatively, where relevant. It is noted that notwithstanding the specific mitigation for the **Scheme**, operational emissions from energy consumption and road user emissions are likely to decrease during its lifetime due to the decarbonisation of the grid and shift towards electric vehicles as set out in national policy.

19.4.12. The future baseline GHG emissions for existing land-use without the **Scheme** are expected to remain similar.

19.5. Potential Impacts

[section to be completed]

Construction Phase

CCRA

19.5.1. Due to the relatively short construction programme (construction is anticipated to be phased over a 5 year period, with the **Scheme** anticipated to be fully operational by 2032), variations in climatic parameters would be minimal compared to the present day baseline. Construction work practices are being adapted to existing climate conditions and weather in the UK. Appendix 19c summarises potential changes in climatic parameters further into the future. These changes are likely to occur gradually, and it is considered that construction contractors will be able to adapt working methods over time, if necessary, should the development be built in later phases. For example, warmer winter conditions may extend the time certain construction activities, such as concrete pouring, can be carried out. A greater chance of summer heatwave conditions may require adaptations, such as shading work areas or increased attention to construction dust control measures.

19.5.2. Direct short term negligible and not significant effects are predicted in the construction phase as a result of climate change. As such, no further consideration of construction phase impacts of climate change will be given.

GHG Assessment

19.5.3. This section considers the embodied carbon emissions associated with the consumption of materials and fuel required to construct the **Scheme**. This has included consideration of the **EMG2 Main Site**, **Highways Works**, and **EMG1 Works**. Construction emissions correspond to LCA stages A1-A5[2].

19.5.4. A summary of the methodology used to calculate construction stage emissions is provided below. Further details are provided in Appendix 19b.

EMG2 Main Site

19.5.5. Construction emissions associated with the **EMG2 Main Site** would arise from the following:

- embodied emissions from the manufacturing and construction of the buildings;
- embodied emissions from the manufacturing and construction of the ancillary infrastructure;
- construction activities (including transport of materials to site and energy use by construction plant); and
- land use change including landscape planting and bunding.

Buildings

19.5.6. A published benchmark (OneClick LCA, 2023) has been used to estimate emissions associated with the construction of the buildings without mitigation, given such benchmarks present business-as-usual construction emissions intensities. The benchmark (605 $kgCO_2e/m^2$) is specific to UK warehouses, and corresponds to LCA stages A1-A3. This benchmark was scaled by the total gross internal area (GIA) at the **EMG2 Main Site**, as informed by the Parameters Plan set out at **Figure 3.1**. Associated emissions total 181,598 tCO_2e.

19.5.7. LCA stages A4 and A5 associated with the buildings are discussed in paragraphs 19.5.11 to 19.5.12 below.

Infrastructure

19.5.8. Pre-mitigation emissions have been informed by material estimates provided by the project design team (covering the paved infrastructure elements, including internal roads, parking and loading areas, access works and the bus interchange terminal; surface, binder and base course depths were provided). These were then scaled by the development area of each infrastructure element (informed by the design team and the indicative masterplan in **Figure 3.2**) and relevant

[2] Carbon life-cycle stages A1-A3 refer to the 'product' stage embodied emissions (i.e. the emissions associated with the extraction, processing and manufacturing of building materials). Carbon life-cycle stages A4 and A5 refer to the 'construction' stage embodied emissions (i.e. the emissions associated with the transport of building materials to the construction site and all construction processes on-site) (RICS, 2023).

emissions factors, as reported within the OneClick LCA Materials database (OneClick LCA, 2024). Emissions factors used align with business-as-usual material specifications, and do not account for any best practice reduced embodied carbon materials. Associated emissions total 10,719 tCO_2e.

19.5.9. The potential impact of the substation plant has been estimated using data from Environmental Product Declarations (EPDs) for switchgear (2,466 $kgCO_2e$ per unit), alongside a published benchmark (RICS, 2012) to estimate emissions associated with the substation buildings. The benchmark data is expressed in $kgCO_2e/m^2$ of floorspace as an intensity, which was scaled by the total floor area for the substation building. Emissions associated with the substation building and plant total 36 tCO_2e.

19.5.10. [Embodied emissions associated with other infrastructure components (e.g. drainage) have not been calculated at this consultation stage. Final details will be provided on receipt of a material bill of quantities].

Construction Activities

19.5.11. Indicative on-site plant specifications and hours of use over the construction period were used, in combination with appropriate emissions factors (OneClick LCA, 2024), to calculate emissions associated with the site construction activities for the **EMG2 Main Site** (LCA stage A5). Emissions associated with the construction plant total 9,005 tCO_2e.

19.5.12. [Emissions associated with transport of material to site (LCA stage A4) have not yet been calculated at this consultation stage. Final details will be provided on receipt of construction traffic movements],

Land Use Change

19.5.13. The current land use for the **EMG2 Main Site** is arable land. Desk study and field study data (see Chapter 15: Agriculture and Soils and Chapter 14: Ground Conditions) demonstrate the absence of any significant carbon stores across the site, such as peat or woodland. As such any emissions resulting from the change in land use would be negligible.

Highways Works

19.5.14. Construction emissions resultant from the **Highways Works** would arise from the following activities:

- manufacturing and construction of strategic and local highways infrastructure;
- construction activities (including transport of materials to site and energy use by construction plant); and
- land use change.

Highways Infrastructure

19.5.15. Emissions arising from the construction of **Highways Works** infrastructure have been calculated according to the methodology in paragraphs 19.5.8 to 19.5.10 above, accounting for embodied emissions from the Active Travel Link, A453/The Green Improvements, J24

Improvements, EMG2 Access Works and EMG1 Access Improvements. Total pre-mitigation emissions are 17,184 tCO_2e.

19.5.16. [Emissions associated with the bridge construction (associated with the J24 Improvements) and additional civils structures (e.g. piled foundations if required) have not been calculated at this consultation phase. Final details will be provided on receipt of a material bill of quantities.]

Construction Activities

19.5.17. Emissions arising from **Highways Works** plant activities have been calculated according to the methodology in paragraph 19.5.11 above. Total pre-mitigation emissions are 2,444 tCO_2e.

19.5.18. [Emissions associated with the transport of materials to site (LCA stage A4) have not yet been calculated at this consultation stage. Emissions will be considered in further detail on receipt of estimates of construction traffic movements.]

Land Use Change

19.5.19. As per paragraph 19.5.13 above, minimal carbon emissions are anticipated from land use change. Emissions have therefore not been assessed quantitatively.

EMG1 Works

19.5.20. Construction emissions resultant from the **EMG1 Works** would arise from the same sources as reported in paragraph 19.5.5 above in relation to Plot 16. Improvements to the existing EMG1 Rail Freight Terminal are to increase crane heights, with no substantial construction works taking place. Public Transport Interchange enhancements include EV charging infrastructure installation and provision of a drop-off layby, and also do not have substantial construction works. As such, construction emissions from rail freight terminal improvements and Public Transport Interchange enhancements are likely to be negligible and immaterial in the context of the wider works, and have not been quantitatively assessed further and are therefore scoped out.

Buildings

19.5.21. Emissions arising from the construction of **EMG1 Works** buildings have been calculated according to the methodology in paragraphs 19.5.6 to 19.5.10 above. Total pre-mitigation emissions are 15,133 tCO_2e.

Infrastructure

19.5.22. Emissions arising from the construction of **EMG1 Works** infrastructure have been calculated according to the methodology in paragraphs 19.5.8 to 19.5.9 above, accounting for the substation upgrade, car parking areas and HGV turning/loading areas. Total pre-mitigation emissions are 1,368 tCO_2e.

19.5.23. Embodied emissions associated with other infrastructure components (e.g. drainage) have not been calculated at this consultation stage. Further details will be provided at the ES stage, informed by a material bill of quantities.

Construction Activities

19.5.24. Emissions arising from **EMG1 Works** plant activities have been calculated according to the methodology in paragraph 19.5.11 above. Total pre-mitigation emissions are 193 tCO_2e.

19.5.25. Emissions associated with transport of material to site (LCA stage A4) have not yet been calculated at this consultation stage. Final details will be provided on receipt of estimates of construction traffic movements.

Land Use Change

19.5.26. As per paragraph 19.5.13 above, minimal carbon emissions are anticipated from land use change. Emissions have therefore not been assessed quantitatively.

Highways Works

19.5.27. Construction emissions resultant from the **Highways Works** would arise from the following activities:

- manufacturing and construction of strategic and local highways infrastructure;
- construction activities (including transport of materials to site and energy use by construction plant); and
- land use change.

Highways Infrastructure

19.5.28. Emissions arising from the construction of **Highways Works** infrastructure have been calculated according to the methodology in paragraphs 19.5.8 to 19.5.10 above, accounting for embodied emissions from the Active Travel Link, A453/The Green Improvements, J24 Improvements, EMG2 Access Works and EMG1 Access Improvements. Total pre-mitigation emissions are 17,184 tCO_2e.

19.5.29. [Emissions associated with the bridge construction (associated with the J24 Improvements) and additional civils structures (e.g. piled foundations if required) have not been calculated at this consultation phase. Final details will be provided on receipt of a material bill of quantities.]

Construction Activities

19.5.30. Emissions arising from **Highways Works** plant activities have been calculated according to the methodology in paragraph 19.5.11 above. Total pre-mitigation emissions are 2,444 tCO_2e.

19.5.31. [Emissions associated with the transport of materials to site (LCA stage A4) have not yet been calculated at this consultation stage. Emissions will be considered in further detail on receipt of estimates of construction traffic movements].

Land Use Change

As per paragraph 19.5.13 above, minimal carbon emissions are anticipated from land use change. Emissions have therefore not been assessed quantitatively

Summary and Magnitude of Impact

19.5.32. The estimated GHG emissions arising from the construction stage of the **Scheme** are presented in Table 19.5. Note that these emissions exclude material transport emissions and embodied emissions from drainage, the bridge structure and other required civils works. [section to be completed].

Table 19.5: Pre-mitigation estimated construction stage GHG emissions

LCA Stage	Item	Emissions (tCO_2e)
A1-A5	**EMG2 Main Site**	**201,357**
	EMG1 Works	**16,694**
	Highways Works	**19,628**
A1-A5	**Total**	**237,679**

19.5.33. The magnitude of impact is therefore 237,679 tCO_2e for the construction period.

Sensitivity of the Receptor

19.5.34. In accordance with paragraph 19.2.26, the receptor (global climate) is considered to be of high sensitivity.

Significance of the Effect

19.5.35. Overall, the magnitude of impact of the **Scheme** is assessed to be 237,679 tCO_2e and the sensitivity of the receptor is high. Consistent with paragraph 19.2.30, the magnitude of emissions has been considered within the context of the UK Carbon Budget (set out in paragraph 19.3.3) and comprises 0.002% and 0.011% of the Fourth and Fifth UK Carbon Budgets (accounting for the phased construction detailed within **Chapter 3: Project Description**).

19.5.36. In the absence of any mitigation measures, it cannot be concluded that the GHG impacts at the construction stage are in keeping with current and emerging local and national climate policy regarding the transition towards net zero.

19.5.37. Considering the magnitude of GHG emissions set out in paragraph 19.5.35 and the absence of mitigation or reduction of emissions, based on the definitions in paragraphs 19.2.31 and 19.2.32 the magnitude of impact of the **Scheme** on the high sensitivity receptor would result in a significant moderate adverse construction-stage effect, prior to consideration of embedded or additional mitigation measures.

Operation

CCRA

19.5.38. As set out in paragraph 19.2.41, assessment of climate change risk cannot easily assign a magnitude of impact or sensitivity of receptor to determine a significance of effect. Instead, a risk-based approach has been applied, which considers the hazard, the likelihood of the effect on the **Scheme** and its users, and the consequence of that effect. Likelihood and consequence criteria are set out in Table 19.2 and Table 19.3, and the subsequent significance matrix is set out in Table 19.4.

19.5.39. The risk assessment in Appendix 19c identifies several risks to the **Scheme** that, prior to implementation of mitigation measures, have the potential to be significant. These are set out below, with the exception of flood risk, which is assessed separately in **Chapter 13: Flood Risk and Drainage**.

- High temperatures resulting in overheating within buildings leading to worker health impacts, for the **EMG2 Main Site** and **EMG1 Works**.
- High temperatures and temperature fluctuations causing thermal contraction and expansion of the pavement, resulting in pavement surfaces cracking (for **EMG2 Main Site**, **Highways Works** and **EMG1 Works**).
- Structural damage to buildings and pavement resulting from subsidence caused by drought (shrinking and swelling of soils due to excessive rainfall and drought), for the **EMG2 Main Site** and **EMG1 Works**.
- Structural damage to buildings resulting from extreme weather events (storms or snow loads) for the **EMG2 Main Site** and **EMG1 Works**.
- Structural damage to bridge structure resulting from subsidence caused by drought (shrinking and swelling of soils due to excessive rainfall and drought), for the **Highways Works**.

19.5.40. Considering the above risks, prior to resilience or adaptation measures to mitigate the risks, this would result in a significant adverse operation-stage effect.

GHG Assessment

19.5.41. This section considers the carbon emissions associated with the operation of the **Scheme**. This has included consideration of the **EMG2 Main Site**, **EMG1 Works** and **Highways Works**. Operational emissions correspond to LCA stages B1-B8[3].

19.5.42. A summary of the methodology used to calculate construction stage emissions is provided below. Further details are provided in Appendix 19b.

19.5.43. The use of the **Scheme** post-completion would result in direct and indirect GHG emissions due to the combustion of fuel and use of electricity within the buildings and the road traffic generated by the **Scheme**, and the use of materials required for refurbishment and maintenance activities.

EMG2 Main Site

19.5.44. Operational emissions associated with the **EMG2 Main Site** would arise from the following activities:

- Operational energy use in the buildings;
- Road user emissions from HGV and commuter movements; and

[3] Carbon life-cycle stages B1-B5 refer to in-use embodied emissions (i.e. emissions associated with the maintenance, repair, replacement and refurbishment of a development, including the embodied emissions of the required materials). Carbon life-cycle stages B6-B7 refer to the 'operational carbon' arising from operational energy and water use. Carbon life-cycle stage B8 refers to other 'user carbon' not included in operational energy and water use, which includes road user emissions (RICS, 2023).

- Emissions from maintenance and refurbishment activities.

Energy Use

19.5.45. Energy demand associated with the **EMG2 Main Site** buildings under the pre-mitigation scenario (i.e. prior to consideration of the energy hierarchy) was calculated within **Appendix 19d**: Energy Statement. Energy modelling was undertaken using the Government approved Integrated Environmental Solutions (IES) thermal modelling methodology, with Building Regulations Part L 2021 forming the pre-mitigation business-as-usual input parameters for building energy and thermal efficiency. Total energy demand was calculated to be 40,712 MWh per year (comprising 3,593 MWh per year of regulated energy[4] and 37,119 MWh per year of unregulated energy[5]).

19.5.46. Annual GHG emissions resultant from the **EMG2 Main Site** buildings were calculated by scaling the calculated energy demand by relevant emission factors (DESNZ and Defra, 2024). Total pre-mitigation operational emissions from the **EMG2 Main Site** buildings under a business-as usual scenario totals 11,205 tCO_2e in the first year of operation, of which 989 tCO_2e is regulated energy and 10,216 tCO_2e is unregulated energy.

19.5.47. It should be noted that figures from the DESNZ and Defra (2024) GHG conversion factors have been used, and as such, the operational GHG emissions form a fixed current year estimate. As such, the 11,205 tCO_2e per annum figure provided for operational GHG use does not account for the steady decarbonisation of electricity that is expected in line with policy and legislation as the UK moves towards its net zero 2050 target. This therefore provides a conservative assumption for the magnitude of impact.

Road Users

19.5.48. The transport emissions associated with the **EMG2 Main Site** during operation include commuters and HGV movements to/from the **EMG2 Main Site**.

19.5.49. Annual average daily traffic (AADT) values for operational traffic movements have been sourced from **Chapter 7: Traffic and Transport**. These movements were scaled by average journey distance factors for HGV freight and commuters (Department for Transport, 2024). Annual GHG emissions resultant from the **EMG2 Main Site** traffic movements were then calculated by scaling the journey distances by relevant emissions factors (DESNZ and Defra, 2024).

19.5.50. Total pre-mitigation emissions from the **EMG2 Main Site** traffic movements under a business-as-usual scenario totals 111,841 tCO_2e in the first year of operation.

19.5.51. It should be noted that, similarly to paragraph 19.5.47 above, the 111,841 tCO_2e per annum figure provided for traffic GHG emissions does not account for the steady decarbonisation of the transport sector that is in line with policy and legislation as the UK moves towards its net zero 2050 target.

[4] Energy consumption from controlled fixed building services and fittings, such as space heating and cooling, lighting, hot water and ventilation.
[5] Energy consumption from other tenant installations and non-fixed appliances.

Refurbishment and Maintenance

19.5.52. Maintenance activities related to the **EMG2 Main Site** largely involve inspection, monitoring, repainting, repair of internal road surfaces and building repair and refurbishment. Emissions associated with such activities include vehicle movements (which are captured within paragraphs 19.5.48 to 19.5.51 above) and embodied emissions associated with the materials used to repair or refurbish the **EMG2 Main Site**.

19.5.53. Embodied emissions associated with the materials used to repair or refurbish the **EMG2 Main Site** have not yet been calculated at this consultation stage. Emissions will be considered in final detail on receipt of likely repair timescales.

EMG1 Works

19.5.54. Operational emissions resultant from the **EMG1 Works** would arise from the same sources as reported in paragraph 19.5.44 above.

19.5.55. As set out in Chapter 3: Proposed Development, no additional capacity for train movements is proposed at the rail freight interchange beyond the 16 trains per day approved through the EMG1 DCO. As such, emissions associated with train movements have not been assessed as part of the **Scheme** in isolation, but are considered qualitatively as part of cumulative effects with the wider EMG1 site.

Energy Use

19.5.56. Emissions arising from the operation of **EMG1 Works** buildings have been calculated in line with the methodology outlined in paragraphs 19.5.45 to 19.5.47, informed by modelled energy demand totalling 1,637 MWh per year (comprising 391 MWh per year of regulated energy, and 1,245 MWh per year of unregulated energy). Total pre-mitigation emissions are 450 tCO_2e in the first year of operation, of which 108 tCO_2e is regulated energy and 343 tCO_2e is unregulated energy.

Road Users

19.5.57. Emissions associated with operational transport movements arising from the **EMG1 Works** have been calculated in line with the methodology outlined in paragraph 19.5.49, and totals 9,021 tCO_2e in the first year of operation.

Refurbishment and Maintenance

19.5.58. [Emissions associated with refurbishment and maintenance have not yet been calculated at this consultation stage. Final detail will be provided on receipt of likely repair timescales have been established.]

Highways Works

[section to be completed]

19.5.59. The operational emissions associated with the **Highways Works** include modified traffic flows from users of the road network as a result of the highways improvements. Emissions will be

calculated using air quality modelling, based on projected traffic flows with and without the **Highways Works**.

Summary and Magnitude of Impact

19.5.60. The estimated GHG emissions arising from the operation of the **Scheme** are presented in Table 19.6. These emissions totals will be updated following the receipt of final information (as detailed above) and the calculation of currently omitted emissions sources.

Table 19.6: Pre-mitigation operational GHG emissions

LCA Stage	Item	Emissions per year of operation (tCO_2e)
B1-B8	**EMG2 Main Site**	123,046
	EMG1 Works	9,471
	Highways Works	TBC
B1-B8	**Total**	**132,517**

19.5.61. The magnitude of impact is therefore 132,517 tCO_2e per year for the operation period.

Sensitivity of the Receptor

19.5.62. In accordance with paragraph 19.2.26, the receptor (global climate) is considered to be of **high** sensitivity.

Significance of Effect

19.5.63. Overall, the magnitude of impact of the **Scheme** is assessed to be 132,517 tCO_2e per year and the sensitivity of the receptor is high. Consistent with paragraph 19.2.30, the magnitude of emissions comprises 0.008% and 0.069% of the Fifth and Sixth UK Carbon Budgets, respectively (set out in paragraph 19.3.3).

19.5.64. As noted in paragraph 19.4.11, the per annum energy consumption emissions for the **EMG2 Main Site** and **EMG1 Works** do not incorporate future UK electricity grid decarbonisation, as the penetration of renewable energy resources increases: the UK government target is to achieve a fully decarbonised power system by 2035 (DESNZ, 2023). Further, as highlighted in paragraph 19.4.11, per annum transport emissions have been calculated using the current UK fleet mix and does not incorporate an increased proportion of zero emission vehicles on UK roads, in line with UK policy.

19.5.65. Nevertheless, in the absence of any mitigation measures, it cannot be concluded that the GHG impacts during operation are in keeping with current and emerging local and national climate policy regarding the transition towards net zero.

19.5.66. Considering the magnitude of GHG emissions set out in paragraph 19.5.61 and the absence of mitigation or reduction of emissions, based on the definitions in paragraphs 19.2.31 and 19.2.32 the magnitude of impact of the **Scheme** on the high sensitivity receptor would result in a significant moderate adverse operation-stage effect, prior to consideration of embedded or additional mitigation measures.

19.6. Mitigation Measures

Construction Phase

GHG Mitigation Measures

19.6.1. One of SEGRO's strategic priorities, as part of its Responsible SEGRO framework, is "Championing Low Carbon Growth". Emissions associated with the construction phase of both the proposed buildings and infrastructure will be reduced where practicable through low carbon procurement and encouraging low carbon construction practices. Mitigation measures to achieve these aims are set out in further detail below.

EMG2 Main Site

19.6.2. The Applicant is committed to reducing embodied emissions in its buildings, given their commitment to achieve Net Zero across all business operations by 2050 at the latest. As such, all new construction projects aim to have an embodied emissions intensity of less than 320 $kgCO_2e/m^2$ lettable floor area. This target covers emissions from LCA stages A1-A5, and includes all major building elements, external parking and paving areas, though excludes internal furnishings and mechanical and electrical plant. The target applies to the **Scheme**, and will be achieved through the following measures, where feasible:

- Use of recycled steel in building structure, including structural steel and steel rebar.
- Use of low carbon concrete in building structure. For example, low to medium strength grade concrete could include recycled cement binders, or ground granulated blast furnace slag (GGBS) as a cement replacement.
- Use of cross laminated timber rather than steel within office buildings, where feasible.
- Use of recycled materials within asphalt for parking areas.
- Low carbon construction site activities (see paragraphs 19.6.4 to 19.6.6 below).
- Additionally, the Applicant is targeting BREEAM 'Outstanding' and Energy Performance Certificate (EPC) rating of Band 'A+' for all buildings, with sustainable design and performance essential to achieve this.

19.6.3. The Applicant is also committed to reducing embodied emissions in the infrastructure elements of the **Scheme**. This will be achieved through the following measures:

- Material reduction ("no build").
    - Where feasible, kerbs and pavements will be reduced and provided on one side of internal roads, in particular in areas where there is no frontage.
    - The **Scheme** design will minimise the need for slope stabilisation by designing shallow (1 in 3 or shallower) slopes across the **Scheme**. As such, no slope stabilisation measures have been specified in the design.
    - A cut/fill balance will be achieved. On-site materials will be used for bund creation, with no import of additional material.
- Material replacement (low carbon alternatives).

- Warm mix asphalt will be used as preference across the **Scheme**. Warm mix asphalts require a lower temperature at which material is mixed in comparison with hot mix asphalts. As such, less fuel is required allowing a less carbon intense manufacturing process.
- Recycled plastic content would be considered as a bitumen replacement for internal roads and pavements as a lower carbon alternative. Basalt geogrid could also be considered in internal road design to reduce the quantity of bitumen required.
- Recycled aggregates, if locally sourced, would be considered for use across the **Scheme**. Recycled aggregate pavement comprises crushed asphalt pavement usually from road resurfacing projects. The material is reused within the new road surface.
- Permeable paving/eco grids would be considered for use in parking areas and footways. These would be used in place of concrete or asphalt surfaced areas as a lower carbon alternative, and the inclusions of such paving would also aid in the provision of sustainable drainage systems (SuDS).
- Recycled plastic pipework for drainage infrastructure will be used in place of pre-cast concrete options.

19.6.4. Good working practices during the construction of the **Scheme** are being defined through a Construction Environmental Management Plan (CEMP) (**Appendix** [**xx**]). The CEMP will ensure that, where possible, construction activities generating GHG emissions are undertaken efficiently in order to minimise emissions in the following ways:

- where practicable, pre-fabricated elements would be delivered to the site ready for assembly, which will reduce on-site construction waste and reduce vehicle movements as part of the construction process;
- construction materials should be sourced locally where practicable, to minimise the impact of transportation;
- vehicles used in road deliveries of materials, equipment and waste arisings on- and off-site would be loaded to full capacity to minimise the number of journeys associated with the transport of these items;
- all machinery and plant would be procured to adhere with emissions standards prevailing at the time and should be maintained in good repair to remain fuel efficient;
- when not in use, vehicles and plant machinery involved in site operations would be switched off to further reduce fuel consumption;
- where possible, local waste management facilities would be used to dispose of all waste arisings, to reduce distant travelled and associated emissions;
- the volume of waste generated would be minimised, and resource efficiency maximised, by applying the principles of the waste hierarchy throughout the construction period. Segregated waste storage should be employed to maximise recycling potential for materials; and
- equipment and machinery requiring electricity would only be switched on when required for use. Procedures should be implemented to ensure that staff adhere to

good energy management practices, e.g. through turning off lights, computers and heating/air conditioning units when leaving buildings.

19.6.5. Additional plant efficiency improvements that will be explored to further reduce emissions associated with construction plant include: the use of telematics and/or real-time operator feedback, alongside automatic control for idling, acceleration, and braking; hybrid excavators with energy recovery on the swing system; and GPS precision control for areas/levels/slopes during earth movement to reduce idling time while marking out areas, and to avoid reworking areas.

19.6.6. Alternative construction plant fuel may be used in place of diesel where there is availability. For example, biodiesel can now be used across construction projects and may provide a significant reduction in construction plant emissions. Electric construction plant are becoming more accessible and are anticipated to be included within the plant fleet to be used during the site preparation works. Should such plant be charged using electricity collected directly from on-site solar photovoltaics (PV), then resultant emissions would be zero; should grid electricity be used then operational emissions resultant from such plant would still be significantly lower than those arising from similar plant fuelled by diesel.

19.6.7. As part of the landscaping design, areas of woodland planting with the **EMG2 Main Site** are proposed. The landscape planting proposed would sequester carbon over the **Scheme's** lifetime as the woodland matures.

19.6.8. Good practice soil management construction practices are set out in the site-specific Soil Management Plan (SMP), in Appendix 15c. Adherence to the SMP will protect soil resources, ensuring their availability for use in landscaping, and minimise soil disturbance.

EMG1 Works

19.6.9. Mitigation measures are identical to those proposed for the **EMG2 Main Site** in paragraphs 19.6.1 to 19.6.8 above, with the exception of landscaping, which is already present at **EMG1** and as such no additional landscape planting is proposed.

Highways Works

19.6.10. Mitigation measures are identical to those proposed for the **EMG2 Main Site** in paragraphs 19.6.1 to 19.6.8 above, with the exception of the following:

- Building mitigation measures are not relevant to the Highways Works, as no buildings are proposed.
- Mitigation measures for the highways infrastructure are constrained by National Highways requirements for road design. As such, whilst the range of mitigation measures in paragraph 19.6.3 will be explored where relevant to highways infrastructure, any specific measures must align with the National Highways design requirements in the "Manual of Contract Documents for Highway Works" (National Highways, 2024) at the time of construction. Warm mix asphalt will however be specified across the **Scheme**, including for highways works.
- Landscaping mitigation for the Highways Works is not yet available at this consultation stage. More details will be provided at the ES stage

Operation

CCRA Mitigation Measures

19.6.11. Flood risk protection and resilience should be implemented as specified in **Chapter 13: Flood Risk and Drainage**.

19.6.12. Measures to mitigate against other climate change risks are set out in Appendix 19c. These comprise standard best practice design measures, and include:

- **EMG2 Main Site** and **EMG1 Works**:
    - Building design to include adequate ventilation, in line with building regulations, and design to minimise excessive solar gain during the summer.
    - Building design to maximise water efficiency during operations and include water recycling measures within building design.
    - Building design to follow regulations for structural design with safety margin. Ensure appropriate maintenance schedule.
    - Green infrastructure to be included within development design, which has the potential to reduce urban temperatures.
    - Internal road and parking design to be in line with best practice design standards.
    - Regular maintenance of road and parking surfaces to be undertaken.
    - Drainage infrastructure will be designed to adequately manage rainfall and runoff.
- **Highway Works**:
    - Road design in line with latest available National Highways design standards, including for structural safety, emergency and maintenance vehicle access.
    - Regular maintenance of road surfaces to be undertaken.
    - Bridge design in line with latest available National Highways design standards.

GHG Mitigation Measures

EMG2 Main Site

19.6.13. Buildings will be designed such that they have the ability for occupiers to be net zero in operation. This will be achieved through wide ranging energy efficiency initiatives including targeting an EPC rating of Band 'A+' and a minimum of BREEAM 'Outstanding' as part of SEGRO base build specification and on-site installation of solar PV generating renewable energy for occupiers, and enabling decarbonisation in parallel with grid electricity. Specific mitigation measures are set out in more detail below.

19.6.14. The Energy Report appended to this chapter (**Appendix 19d**) details the means by which the emissions associated with the operational energy demand of the **Scheme** buildings will be reduced. The strategy follows the energy hierarchy: be lean (reduce building energy

consumption), be clean (supply the energy required in an efficient manner), and be green (supply remaining energy from low carbon and renewable energy sources).

19.6.15. 'Be lean' mitigation measures are listed below:

- Building fabric elements and glazing specifications significantly improved to the Building Regulation requirements.
- Reduced air permeability compared to maximum required standards.
- Specification of efficient heating services and control systems.
- Energy efficient lighting throughout the development.

19.6.16. The Energy Report has evaluated the feasibility of 'be clean' measures, notably connection of the **EMG2 Main Site** to an area wide heat network, and use of a Combined Heat and Power (CHP) unit. Both have been assessed as infeasible due to the lack of existing district heating networks and major local heat sources, and low heating demand of the **EMG2 Main Site**, respectively.

19.6.17. With regards to the final level of the energy hierarchy – be green – solar PV will be installed on 20% of unit roof areas to provide renewable energy supply for the remaining demand after energy efficiency measures are applied. In addition, the structural design of the buildings allow for 100% of unit roof areas to be covered by solar PV to enable the buildings to be 'future-proofed' should there be additional demand for renewable energy on-site.

19.6.18. With regards to emissions resultant from operational transport movements, a Sustainable Travel Strategy (STS) has been prepared and submitted as part of the DCO Application. The STS sets out how sustainable travel will be enhanced and proposed at the **Scheme**, to ensure that future employees have viable and attractive options to walk, cycle, use public transport, car share or use electric vehicles to reach the site.

19.6.19. The STS seeks to build on the success of embedding sustainable travel at EMG1 by incorporating the measures that have had the greatest impact. Key targets and measures included in the STS are:

- 18% of employees should car share to site within 5 years of full occupation.
- 9% of employees should arrive by public transport within 5 years of full occupation.
- 6% of employees should arrive by walking or cycling within 5 years of full occupation.
- Provision of new Active Travel Link throughout and between the **EMG2 Main Site** and EMG1, alongside wider connectivity enhancements to facilitate pedestrian and cycling movements within and beyond the site.
- Existing bus services will be routed to serve the proposed bus interchange on the **EMG2 Main Site**, in addition to the provision of a new site electric shuttle bus service. Additional capacity for local bus services will also be funded and secured as part of the DCO.
- Expand the existing car share platform at EMG1 to encompass the **Scheme**.
- Provision of EV charging capability for at least 20% of all car parking spaces.

- Provide sustainable transport options from first occupation of the site.
- Working with local stakeholders, transport authorities and operators to jointly deliver strategies, and reporting annually on the effectiveness of the implemented initiatives.

EMG1 Works

19.6.20. Mitigation measures are identical to those proposed for the **EMG2 Main Site** in paragraphs 19.6.13 to 19.6.19 above. The STS, whilst primarily aimed at reducing transport emissions at the **EMG2 Main Site**, builds on the existing STS at EMG1, which the **EMG1 Works** will enhance.

Highways Works

19.6.21. There are no specific operational GHG mitigation measures for the Highways Works. Operational energy use for the Highways Works is limited to road lighting, and would be minimal.

19.7. Residual Effects

Assessment of Construction Effects

CCRA

19.7.1. As per paragraph 19.5.2, short term **negligible** and **not significant** effects are predicted in the construction phase as a result of climate change.

GHG Assessment

19.7.2. The mitigation measures set out in Section 6 have been taken into consideration to calculate a realistic and achievable reduction in embodied carbon from the from the calculated pre-mitigation scenario for the **Scheme**. It is anticipated that not all of the above mitigation measures will be implemented at the **Scheme**, due to impact on cost, delivery programme and local availability of materials, for example. As such, project contractors will be expected to apply value engineering and incorporate mitigation measures as appropriate to achieve the level of reductions detailed below.

EMG2 Main Site

Buildings

19.7.3. To calculate the post-mitigation emissions from the buildings element of the **EMG2 Main Site**, an estimated bill of quantities has been calculated, informed by WLC assessments of nine recently completed developments by the Applicant. These developments are considered to represent the Applicant's current design standards for buildings comparable to the **Scheme**. As such, this estimated bill of quantities is considered reflective of likely material use at the **Scheme**, including the ambition of mitigation measures as set out in paragraph 19.6.2.

19.7.4. The estimated bill of quantities was subsequently scaled by emission factors also sourced from other completed developments by the Applicant. Total emissions resultant from the **EMG2 Main Site** buildings post mitigation have been calculated to be 90,073 tCO_2e, with an emissions intensity of 300 $kgCO_2e/m^2$ GIA (A1-A3). Further details on the calculation methodology can be found in Appendix 19b.

19.7.5. [Embodied emissions associated with the PV proposed to be installed on the building roofs have not yet been quantified at this consultation stage. Further details will be provided in the ES when further details regarding PV specification is available.]

19.7.6. The calculated emissions intensity is lower than SEGRO's targeted building embodied carbon intensity of 320 $kgCO_2e/m^2$ (see paragraph 19.6.2), and corresponds to a 50% reduction compared to the pre-mitigation baseline.

Infrastructure

19.7.7. The mitigation measures set out in paragraph 19.6.3 are anticipated to reduce the magnitude of emissions from infrastructure elements of the **EMG2 Main Site**. As noted in paragraph 19.7.2 above, it is not anticipated that all mitigation measures will be implemented. A range of possible reductions have therefore been quantified, based on the mitigation measures proposed.

19.7.8. Emission reductions from use of warm mix asphalt and recycled aggregate across the internal road network, parking and HGV areas, and bus interchange were calculated using emissions factors sourced from the OneClick LCA Materials database (OneClick LCA, 2024). Emissions from the substation remain the same as pre-mitigation emissions. Should these mitigation measures be employed, emissions could be reduced to 9,626 tCO_2e, which equates to reductions of 10% compared to the pre-mitigation assessment.

19.7.9. [As noted in paragraph 19.5.10 above, drainage emissions have not been calculated at this consultation stage. Further detail will be provided in the ES informed by a material bill of quantities once known.]

Construction Activities

19.7.10. The mitigation measures set out in paragraphs 19.6.4 to 19.6.6 are anticipated to reduce the magnitude of emissions from the **EMG2 Main Site** plant activities. Given the information available at this stage to calculate emissions associated with plant activities, it is not possible to quantitatively assess the proposed mitigation, therefore mitigation measures have been considered qualitatively within the assessment of significance. As such, total post mitigation emissions for the **EMG2 Main Site** construction activities have been reported as 9,005 tCO_2e, consistent with the pre-mitigation assessment.

19.7.11. [As noted in paragraph 19.5.12 above, material transport emissions have not been calculated at this consultation stage. Further detail will be provided in the ES informed by estimates of construction traffic movements once known].

Land Use Change

19.7.12. As per paragraph 19.5.13 above, minimal carbon emissions are anticipated from land use change. Further, good practice soil management construction practices are set out in the site-specific Soil Management Plan (SMP) (Appendix 15c). Adherence to the SMP will protect soil resources ensuring their availability for use in landscaping, and minimise soil disturbance. Emissions have therefore not been assessed quantitatively.

19.7.13. A number of landscape features will be delivered as part of the Scheme. This includes mixed broadleaf woodland, which has the potential to sequester CO_2 over the lifetime of the **Scheme**. The magnitude of emissions removal as part of the landscaping is included in paragraph 19.7.47 below, as part of the operational emissions assessment given the effect would be realised over the lifetime of the **Scheme**.

EMG1 Works

Buildings

19.7.14. Post-mitigation emissions from the **EMG1 Works** buildings have been calculated in line with the methodology in paragraphs 19.7.3 to 19.7.5. Total post-mitigation emissions are 7,838 tCO_2e, with a building emissions intensity of 314 $kgCO_2e/m^2$ GIA (A1-A3). The calculated emissions intensity is lower than the Applicant's targeted building embodied carbon intensity of 320 $kgCO_2e/m^2$ (see paragraph 19.6.2), and corresponds to a 48% reduction compared to the pre-mitigation assessment.

Infrastructure

19.7.15. Post-mitigation emissions from the **EMG1 Works** infrastructure have been calculated in line with the methodology in paragraphs 19.7.7 to 19.7.8. Total post-mitigation emissions are 1,250 tCO_2e, which corresponds to a 9% reduction compared to the pre-mitigation assessment.

19.7.16. [As noted in paragraph 19.5.23 above, drainage emissions have not been calculated at this consultation stage. Final detail will be provided on receipt of a material bill of quantities].

Construction Activities

19.7.17. For the reasons presented in paragraph 19.7.10 above, post-mitigation emissions are conservatively assessed to be 193 tCO_2e for the **EMG1 Works** construction activities.

19.7.18. [As noted in paragraph 19.5.12 above, material transport emissions have not been calculated at this consultation stage. Final detail will be provided on receipt of the estimates of construction traffic movements].

Land Use Change

19.7.19. As per paragraph 19.5.13 above, minimal carbon emissions are anticipated from land use change. Emissions have therefore not been assessed quantitatively.

Highways Works

Highways Infrastructure

19.7.20. Using the methodology presented in paragraphs 19.7.7 to 19.5.8 above, post-mitigation emissions are calculated to be 15,375 tCO_2e for the **Highway Works** infrastructure, corresponding to an 11% reduction compared to the pre-mitigation assessment.

19.7.21. [As noted earlier, emissions associated with the bridge construction (associated with the J24 **I**mprovement) and additional civils structures (e.g. piled foundations if required) have not been calculated at this consultation phase. Final details will be provided on receipt of a material bill of quantities].

Construction Activities

19.7.22. Using the methodology presented in paragraph 19.7.10 above, post-mitigation emissions are calculated to be 2,444 tCO_2e for the **Highway Works** construction activities.

Land Use Change

19.7.23. As per paragraph 19.5.13 above, minimal carbon emissions are anticipated from land use change. Emissions have therefore not been assessed quantitatively. [Emissions from material transport and the bridge have not been calculated at this consultation stage. Final details will be provided on receipt of further information].

Summary and Magnitude of Impact

19.7.24. The post-mitigation estimated GHG emissions arising from the construction stage of the **Scheme** are presented in Table 19.7. Note that these emissions exclude material transport emissions and embodied emissions from drainage, the bridge structure and other required civils works. [section to be completed]

Table 19.7: Estimated post-mitigation construction stage GHG emissions

LCA Stage	Item	Emissions (tCO_2e)
A1-A5	**EMG2 Main Site**	108,704
	EMG1 Works	9,281
	Highways Works	17,819
A1-A5	**Total**	**135,804**

19.7.25. The magnitude of impact is therefore 135,804 tCO_2e for the construction period.

Sensitivity of the Receptor

19.7.26. In accordance with paragraph 19.2.26, the receptor (global climate) is considered to be of high sensitivity.

Significance of the Effect

19.7.27. Overall, the magnitude of impact of the **Scheme** is assessed to be 135,804 tCO_2e and the sensitivity of the receptor is high. Consistent with paragraph 19.2.30, the magnitude of

emissions comprises 0.001% and 0.006% of the Fourth and Fifth UK Carbon Budgets, respectively (set out in paragraph 19.3.3).

19.7.28. The total post-mitigation magnitude of emissions has been calculated to be a 43% emissions reduction compared to the pre-mitigation assessment. In addition, mitigation measures set out in paragraphs 19.6.3 to 19.6.7 are likely to further reduce the magnitude of emissions. Detailed WLC assessments will be undertaken prior to construction, and post practical completion, which will provide further details on the low-carbon design measures selected for the **Scheme**.

19.7.29. The Net Zero Carbon Building Standard (NZCBS) pilot edition (UK Green Building Council, 2024) provides technical details on how UK buildings should be constructed and operated in a low-carbon way. A building that verifiably demonstrates alignment with the NZCBS is classified as 'Net Zero Carbon Aligned'. Should all UK buildings align to the NZCBS, the buildings sector would meet its share of the UK carbon budgets to enable a 1.5°C trajectory.

19.7.30. The NZCBS contains limits for upfront embodied carbon specific to warehousing: with construction starting in 2028 (in line with the timescales presented in Chapter 3), the limit is 540 $kgCO_2e/m^2$ GIA (including LCA modules A1-A5).

19.7.31. Table 19.8 presents the construction emissions intensities for the **EMG2 Main Site** and **EMG1 Works** buildings in the context of the NZCBS embodied carbon intensity limits, and the SEGRO embodied carbon intensity target of 320 $kgCO_2e/m^2$. These two intensities are not directly comparable, as the SEGRO target covers LCA modules A1-A3, whilst the NZCBS limit covers LCA modules A1-A5. As such, two intensities have been calculated for the **EMG2 Main Site** and **EMG1 Works** buildings – an A1-A3 intensity and an A1-A5 intensity (both presented as tCO_2e per m^2 GIA).

19.7.32. Table 19.8 also presents construction emissions intensities for the **Highways Works** infrastructure, with A1-A5 emissions normalised against length of the highways, as recommended by National Highways (2021) guidance.

Table 19.8: Post-mitigation construction stage GHG emission intensities

Module	Scheme Element	Intensity	Applicable limit/target	Limit/target intensity
A1-A3	**EMG2 Main Site buildings**	300 $kgCO_2e/m^2$	SEGRO	320 $kgCO_2e/m^2$
	EMG1 Works buildings	314 $kgCO_2e/m^2$		
	Highways Works	1,680 $kgCO_2e/m$	NA	NA
A1-A5	**EMG2 Main Site buildings**	330 $kgCO_2e/m^2$	NZCBS	540 $kgCO_2e/m^2$
	EMG1 Works buildings	321 $kgCO_2e/m^2$		
	Highways Works	1,947 $kgCO_2e/m$	NA	NA

19.7.33. When compared to the emission intensities for the **Scheme** in Table 19.8, it can be seen that the **EMG2 Main Site** and **EMG1 Works** building emission intensities are lower than the NZCBS limit and the SEGRO embodied carbon target. As such, it can be concluded that the construction

emissions from the building elements of the **Scheme** are in keeping with the UK's net zero carbon trajectory, and local and national policy.

19.7.34. It should be noted that the NZCBS includes building elements and LCA modules not covered in the emission intensities in Table 19.8 (for example, mechanical and electrical plant (MEP) are excluded, and material transport emissions (LCA stage A4) are yet to be calculated). However, the **EMG2 Main Site** buildings and **EMG1 Works** buildings intensities are 39% and 41% respectively lower than the NZCBS. Given the extent to which these intensities are lower than the NZCBS limit, it is considered unlikely that the incorporation of the additional building elements and transport emissions are unlikely to result in the NZCBS limits being exceeded.

19.7.35. No comparable embodied carbon benchmarks or targets are available for infrastructure developments. However, when considering the mitigation measures in paragraph 19.6.3 above, it is considered that the **EMG2 Main Site**, **EMG1 Works** and **Highways Works** infrastructure is in keeping with national and local decarbonisation policy goals (including the National Infrastructure Strategy (HM Treasury, 2020), the UK Net Zero Strategy (BEIS, 2021a) and the North West Leicestershire Local Plan (NWLDC, 2021)).

19.7.36. Considering the quantifiable emissions reductions set out in paragraph 19.7.28, the magnitude of emissions in the context of national carbon budgets, proposed mitigation measures set out above, alignment with net zero-aligned benchmarks, and alignment with local and national policy, based on the definitions in paragraphs 19.2.31 and 19.2.32 the magnitude of impact of the **Scheme** on the **high sensitivity** receptor would result in a **minor adverse** construction-stage effect, which is **not significant**.

Assessment of Operational Effects

CCRA

19.7.37. As highlighted in paragraph 19.5.39, the main risks from climate change on the **Scheme** are related to consistently heightened temperatures, changes to rainfall patterns, increased humidity and increased frequency of extreme events such as floods and storms. The potentially significant risks are listed in paragraph 19.5.39 and in Appendix 19c.

19.7.38. Considering the mitigation measures set out in paragraphs 19.6.11 and 19.6.12, the CCRA concluded that the effect of climate change on the operation of the **Scheme** is **negligible** with no risk being assessed as significant. This is **not significant** in EIA terms.

GHG Assessment

19.7.39. The mitigation measures set out in paragraphs 19.6.13 to 19.6.19 have been taken into consideration to calculate a realistic and achievable reduction in operational carbon from the from the calculated baseline for the **Scheme**. Where mitigation measures cannot be quantified at this stage (owing to the early design stage of the **Scheme**), additional context around the potential emissions savings has been provided where possible. This context has been based on the implementation of similar mitigation measures at EMG1.

EMG2 Main Site

Energy Use

19.7.40. The impact of the mitigation measures set out in paragraphs 19.6.13 to 19.6.17 have been modelled in the Energy Report appended to this chapter (Appendix 19.4), which details the extent to which the mitigation measures will reduce operational emissions resultant from the **Scheme**, in comparison to the pre mitigation scenario. These measures ensure that the **EMG2 Main Site** buildings are in line with the indicative Future Buildings Standard specifications for non-domestic buildings (Department for Levelling up, Housing and Communities, 2024), with high levels of energy efficiency and no fossil fuel heating.

19.7.41. With regards to the 'be lean' measures, energy modelling incorporated improvements beyond building regulation requirements, including improvements in U values for all building fabric elements and openings, specification of high efficiency building services, in order to exceed current Part L requirements and meet the indicative Future Building Standard requirements. Such energy reduction measures together result in a 350 MWh per year reduction in regulated operational energy over the baseline, which equates to a 96 tCO_2e per year reduction in emissions and 10% reduction in regulated energy demand.

19.7.42. With regards to the 'be green' measures, solar PV will be installed to cover 20% of building roofs. This will provide 1,034 MWh per annum (3.4 kWh per m^2 of building footprint), delivering 285 tCO_2e savings in regulated energy per year (a saving of 29% compared to the pre-mitigation assessment). Warehouses will have the structural capacity to support 100% PV coverage, and as such, should tenants require greater unregulated energy demand from more energy intense activities than anticipated, greater coverage of PV can be accommodated.

19.7.43. Overall, the operational energy emissions reduction measures result in modelled energy consumption of 39,328 MWh per year (2,209 MWh per year regulated energy demand, and 37,119 MWh per year unregulated energy demand). Applying the methodology outlined at 19.5.45 to 19.5.47, associated emissions total 10,824 tCO_2e per annum in the first year of operation, of which 608 tCO_2e arises from regulated energy demand and 10,216 tCO_2e arises from unregulated energy demand.

19.7.44. This corresponds to a saving of 1,384 MWh and 381 tCO_2e per annum (arising from the reduction in regulated energy demand), and a 39% reduction in regulated emissions in comparison to the pre-mitigation assessment. Owing to the nature of unregulated energy (i.e. resulting from a system or process that is not controlled), reductions in such electricity consumption is not within the scope of the Applicant and would rely on tenants to install efficient building equipment/appliances. Therefore, reductions in such demand have not been modelled. Overall, the mitigation measures applied result in a reduction of 3.4% in total energy emissions.

Road Users

19.7.45. The application the STS, as detailed in paragraphs 19.6.18 and 19.6.19, is anticipated to reduce operational transport movements, and hence reduce the magnitude of emissions from operational transport at the **EMG2 Main Site**. A similar STS has been implemented at EMG1 with associated emissions savings assessed within [Appendix 6[x]]: EMG1 Commuter-Related Carbon Calculations. Emissions savings reported indicate the extent of emissions savings that could be achieved at the **EMG2 Main Site**: from 2019 to 2023 the implementation of sustainable

transport initiatives at EMG1 resulted in a cumulative saving of 4,431 tCO_2e. Potential emissions savings for **EMG2 Main Site** at full occupation have been forecast, assuming that **EMG2 Main Site** achieves a similar level of sustainable commuting as EMG1, and totals emissions savings of 789 tCO_2e per year. Post-mitigation transport emissions are therefore 111,052 tCO_2e, a saving of 9.1% for commuter emissions and 0.7% for total **EMG2 Main Site** operational transport emissions. Refer to Appendix [6[x]X] for further information on the STS and associated CO_2e savings.

Refurbishment and Maintenance

19.7.46. [As detailed at 19.5.53, emissions associated with refurbishment and maintenance have not yet been calculated at this consultation stage. Further detail will be provided at the ES stage once likely repair timescales have been established].

Land Use Change

19.7.47. There will be substantial landscape planting at the **EMG2 Main Site**, including mixed broadleaved woodland (see **Figure 3.2**). When managed sustainably, woodland acts as a "carbon sink", sequestering or removing CO_2 from the atmosphere over time. As such, the landscape planting will reduce total lifetime emissions associated with the **Scheme**. The landscape plan (**Figure 10.11**) includes an area of approximately 10.8 ha for mixed broadleaf woodland planting.

19.7.48. The emissions removals from woodland planting have been calculated using Woodland Carbon Code (WCC) modelling, an internationally recognised standard for calculating carbon storage from woodland restoration and planting projects. Average yearly removals during the operation of the Scheme are calculated to be 75 tCO_2e.

EMG1 Works

Energy Use

19.7.49. Using the methodology detailed in paragraph 19.7.40, **EMG1 Works** operational energy consumption post-mitigation has been assessed to be 1,487 MWh per year (comprising 241 MWh of regulated energy demand, and 1,245 MWh of unregulated energy demand per annum). The proposed PV installation would generate 112 MWh per year (4.5 kWh/m^2 building footprint). Applying the methodology outlined at 19.5.45 to 19.5.47, associated emissions total 409 tCO_2e per annum in the first year of operation, of which 66 tCO_2e is regulated energy and 343 tCO_2e is unregulated energy. This corresponds to a reduction of 38% in regulated energy, and 9% reduction in total energy demand compared to pre-mitigation assessment.

Road Users

19.7.50. The emissions reductions from the implementation of the STS have been applied to the **EMG2 Main Site** emissions only, given the measures detailed apply to the **EMG2 Main Site**, with the **EMG1 Works** benefiting from the existing sustainable transport measures already implemented at the consented EMG1. As such **EMG1 Works** operational traffic emissions post-mitigation are unchanged from the pre-mitigation assessment, at 9,021 tCO_2e per year.

Refurbishment and Maintenance

19.7.51. [Emissions associated with refurbishment and maintenance have not yet been calculated at this consultation stage. Final details will be provided on receipt of likely repair timescales].

Highway Works

19.7.52. [As per paragraph 19.5.60, operational emissions from the Highways Works have not yet been quantified at the consultation stage. [section to be completed].

Summary and Magnitude of Impact

19.7.53. The post-mitigation estimated GHG emissions per year arising from operation of the **Scheme** are presented in **Table 19.9**. [These emissions totals will be updated following the receipt of final information (as detailed above) and the calculation of currently omitted emissions sources].

Table 19.9: Estimated post-mitigation operation GHG emissions

LCA Stage	Item	Emissions (tCO_2e)
B1-B8	**EMG2 Main Site**	121,802
	EMG1 Works	9,430
	Highways Works	TBC
B1-B8	**Total**	**131,232**

19.7.54. The magnitude of impact is therefore 131,232 tCO_2e per year for the construction period.

Sensitivity of the Receptor

19.7.55. In accordance with paragraph 19.2.26, the receptor (global climate) is considered to be of high sensitivity.

Significance of Effect

19.7.56. Overall, the magnitude of impact of the **Scheme** is assessed to be 131,232 tCO_2e and the sensitivity of the receptor is high. Consistent with paragraph 19.2.30, the magnitude of emissions comprises 0.008% and 0.068% of the Fifth and Sixth UK Carbon Budgets, respectively (set out in paragraph 19.3.3).

19.7.57. As noted in paragraph 19.4.11, the energy consumption emissions for the **EMG2 Main Site** and **EMG1 Works** do not incorporate future UK electricity grid decarbonisation. Additionally, the per annum transport emissions do not incorporate an increase proportion of zero emission vehicles on UK roads. As such, the magnitude of operational emissions reported likely presents an overestimate.

19.7.58. The total post-mitigation magnitude of emissions has been calculated to be a 1% emissions reduction compared to the pre-mitigation assessment. These reductions arise from the following measures:

- 'Be lean' and 'be green' mitigation measures for the **EMG2 Main Site** and **EMG1 Works** buildings, resulting in a 39% reduction in regulated energy emissions.

- Implementation of the STS, resulting in a 9% reduction in commuter transport emissions.

19.7.59. Given the majority of emissions arise from unregulated energy use in the buildings and HGV movements, both of which are reported to remain the same as pre-mitigation emissions, the overall reduction in operational emissions appears to be negligible despite the above described mitigation. This is due to the limited influence that the Applicant has on these emissions sources, in particular unregulated energy demand as noted in paragraph 19.7.43 above. The mitigation the Applicant is able to implement (i.e. regarding regulated energy demand reductions and sustainable travel to site) is considered to align with local and national policy and a net zero trajectory. This is further examined below.

19.7.60. The NZCBS (see paragraph 19.7.29) contains limits and targets for operational energy use limits. For unrefrigerated warehouses, with construction starting in 2028, the operational energy use limit is 32 kWh/m^2 GIA per year, and for refrigerated warehouses the limit is 72 kWh/m^2 GIA per year. The **EMG2 Main Site** and **EMG1 Works** operational intensities have been calculated as 131 kWh/m^2 GIA per year and 65 kWh/m^2 GIA per year, respectively. As such, the operational energy intensity for the **Scheme** exceeds the NZCBS limits. However, unregulated energy demand has been calculated without knowledge of occupier activities (including whether warehouses will be predominantly refrigerated or unrefrigerated), and as such has used standard UK Government National Calculation Methodology (NCM) templates for buildings within the B8 category, and true energy consumption (and resultant emissions) will vary significantly depending on how the end user utilises the building. Given the Applicants' commitment to reducing operational carbon emissions (including occupier emissions) by 42% by 2030 (see Chapter 3), the Applicant will engage with its future tenants to reduce unregulated energy use, and aim to meet the NZCBS energy use limits building-wide.

19.7.61. As set out in paragraph 19.7.41, it is considered that the buildings elements of the **Scheme** (including **EMG2 Main Site** and **EMG1 Works**) are in line with the indicative Future Buildings Standard requirements.

19.7.62. The mitigation measures set out in paragraphs 19.6.13 to 19.6.19 are supported by national and local energy and climate change policy (in particular the UK Net Zero Strategy (BEIS, 2021a), the North West Leicestershire Local Plan (NWLDC, 2021) and the Heat and Buildings Strategy (BEIS, 2021b)).

19.7.63. Considering the emissions reductions, the magnitude of emissions in the context of national carbon budgets, proposed mitigation measures, and alignment with local and national policy, based on the definitions in paragraphs 19.2.31 and 19.2.32 the magnitude of impact of the **Scheme** on the **high sensitivity** receptor would result in a **minor adverse** operation-stage effect, which is **not significant**.

Assessment of Whole Life Effects

Magnitude of Impact

19.7.64. It is noted in the IEMA guidance (2022) that due to the nature of GHG emissions, it is good practice to include a section that reports on the whole life GHG emissions associated with a project, alongside the sections that assess construction, operation, and decommissioning

effects in isolation. As such, net GHG emissions from the **Scheme** (total construction-emissions and yearly operational-stage emissions, including committed mitigation measures) are shown in Table 19.10.

Table 19.10: Scheme net GHG impact

Project Stage	GHG Emissions (tCO_2e)			
	EMG2 Main Site	**EMG1 Site**	**Highway Works**	**Scheme total**
Construction	108,704	9,281	17,819	135,804
Operation (per year)	121,802	9,430	TBC	131,232
Total	**230,506**	**18,711**	**17,819**	**267,036**

19.7.65. The net magnitude of impact (accounting for construction and year one of operation) is therefore 267,036 tCO_2e.

Sensitivity of the Receptor

19.7.66. In accordance with paragraph 19.2.26, the receptor (global climate) is considered to be of high sensitivity.

Significance of Effect

19.7.67. Consistent with paragraph 19.2.30, Table 19.11 presents the net emissions in the context of the UK and Carbon Budgets.

Table 19.11: Net emissions and carbon budgets

Carbon Budget	2023-2027	2028-2032	2033-2037	Total[6]
Scheme emissions (tCO_2e)	27,161	239,875	656,158	923,194
Scheme emissions as percentage of UK Carbon budgets (%)	0.001%	0.014%	0.068%	0.020%

19.7.68. As can be seen in Table 19.11, the **Scheme** does not make a material contribution to the UK Carbon Budgets. The magnitude of whole life emissions takes into account the mitigation measures set out in Section 6, which are in line with local and national climate change policy.

19.7.69. The emissions summarised within Table 19.11 are likely to provide a conservative overestimate of emissions resultant from the **Scheme**, particularly with regards to the operational-stage emissions. Emissions resulting from electricity demand have been calculated using current grid average carbon intensity. As noted at paragraph 19.4.11, this does not take into account future decarbonisation of grid electricity and the transport sector in line with national policy and legislation, which will in turn result in reduced operational emissions resultant from the proposed buildings and traffic movements over the **Scheme's** lifetime.

[6] Note that this total represents total emissions during the carbon budget periods (2023-2037), not the Scheme's lifetime.

19.7.70. Using the definitions in paragraphs 19.2.31 and 19.2.32, the impact of whole-life GHG emissions from the **Scheme** on the **high sensitivity** receptor would result in a **minor adverse** whole life effect, which is **not significant.**

19.8. Cumulative Effects

[section to be completed]

Intra-Project Effects

19.8.1. GHG emissions have a global effect rather than directly affecting any specific local receptor. As such, the impacts of the **EMG2** Main Site and **EMG1 Works**, whilst quantified separately, have been assessed for the **Scheme** as a whole. There are therefore no additional intra-project effects aside from those already reported in paragraphs 19.5.37 and 19.5.66.

19.8.2. All developments that emit GHGs have the potential to impact the atmospheric mass of GHGs as a receptor, and so may have a cumulative impact on climate change. Consequently, cumulative effects due to other specific local development projects are not individually predicted but are considered when considering the impact of the **Scheme** by defining the atmospheric mass of GHGs as a high sensitivity receptor.

19.8.3. It is important to note that the **Scheme** will not operate in isolation. The existing EMG1 Rail Freight Terminal will serve both existing occupiers and new occupiers on the **EMG2 Main Site** and Plot 16 (**EMG1 Works**). By utilising the Rail Freight Terminal, tenants could reduce the number of long-haul HGV movements required, hence reducing operational emissions associated with transport movements.

19.8.4. However, as stated in **Chapter 3: Project Description**, no additional capacity for train movements is proposed at the rail freight interchange beyond that approved through the EMG 1 DCO. As such, it is not possible for the Applicant to determine the extent to which future tenants will utilise the Rail Freight Terminal. The cumulative impact of emissions reductions from the use of the Rail Freight Terminal by **EMG2 Main Site** and **EMG1 Works** users have therefore not been quantified within this assessment.

19.8.5. Instead, the cumulative impacts have been assessed qualitatively. Emissions associated with the transport of goods by HGV exceeds those associated with rail (0.09752 $kgCO_2e$ per tonne per km for average laden HGVs, compared to 0.02779 $kgCO_2e$ per tonne per km for rail, offering a 72% reduction (DESNZ and Defra, 2024)). As such, any use of the rail freight interchange during the operation of the **Scheme** will result in reduced emissions compared to those assessed. Overall, the cumulative operational GHG impact of the **Scheme** and the existing EMG1 Rail Freight Terminal is likely to result in reduced emissions, when compared to the operational GHG impact set out in paragraphs 19.5.63 to 19.5.66.

19.9. Summary of Effects and Conclusions

[section to be completed]

19.9.1. The potential impact of GHG emissions due to the **Scheme**, resulting in an effect on the global atmospheric GHG concentration that contributes to climate change, has been assessed and

reported in this chapter. The impacts of climate change on the **Scheme** have also been assessed and reported.

19.9.2. The construction-stage emissions before mitigation total 237,679 tCO_2e, arising from embodied emissions from the manufacturing and construction of buildings, roads and ancillary infrastructure, and energy use for site construction activities. This makes up 0.002% and 0.011% of the fourth and fifth UK Carbon Budgets respectively. Considering this magnitude of emissions, and the absence of measures to ensure the **Scheme** is in line with the UK's net zero trajectory, this would result in a moderate adverse effect, which is significant in EIA terms.

19.9.3. A selection of mitigation measures will be incorporated in order to meet the Applicant's embodied carbon target for new buildings, of 320 $kgCO_2e/m^2$, alongside mitigation measures to reduce emissions from other elements of the **Scheme** (i.e. roads and ancillary infrastructure). Examples of such mitigation measures include the incorporation of lower carbon materials, lower carbon fuel alternatives for construction plant and the site compound, and energy efficiency measures for site activities. Embodied carbon reduction measures implemented would deliver a 43% emissions reduction, resulting in construction-stage emissions totalling 135,804 tCO_2e. The mitigation measures are in line with local and national policy, and the embodied carbon intensity for the buildings is in line with the NZCBS requirements for net zero aligned buildings. Construction emissions make up 0.001% and 0.006% of the UK's fourth and fifth Carbon Budgets respectively. The post mitigation construction effect is therefore **minor adverse**, which is **not significant** in EIA terms.

19.9.4. The operational-stage emissions of the **Scheme** before mitigation would result in 132,517 tCO_2e per annum (using the current grid average and UK road fleet mix). Operational emissions arise from building energy use and operational traffic. Within the context of national carbon budgets, this would lead to a total impact of 795,105 tCO_2e by 2037, which makes up 0.008% and 0.069% of the fifth and sixth UK Carbon Budgets. Considering this magnitude of emissions, and the absence of measures to ensure the **Scheme** is in line with the UK's net zero trajectory, this would result in a moderate adverse effect, which is significant in EIA terms.

19.9.5. Mitigation measures to reduce such operational emissions include building energy efficiency measures, the incorporation of solar PV and the implementation of a travel plan. The implementation of these mitigation measures will deliver a 1% emissions reduction, resulting in operational-stage emissions totalling 131,232 tCO_2e per annum. The magnitude of the emissions reduction is negligible given the majority of emissions associated with the operational-stage of the **Scheme** arise from unregulated energy use in the buildings and HGV movements, both of which are the Applicant has limited influence over. Given the mitigation the Applicant is able to implement (i.e. regarding regulated energy demand reductions and sustainable travel to site), it is considered that mitigation measures committed to are in line with local and national policy (including the Future Buildings Standard). Operational emissions make up 0.008% and 0.068% of the fifth and sixth UK Carbon Budgets. Further, it can be anticipated grid electricity will decarbonise in line with national net zero targets and policy, resulting in further decarbonisation of the remaining operational emissions. The post mitigation operational effect is therefore **minor adverse**, which is **not significant** in EIA terms.

19.9.6. The net emissions of the **Scheme** (total construction emissions and yearly operational-stage emissions, including committed mitigation measures) are 267,036 tCO_2e (post mitigation). Within the context of the UK Carbon Budgets, the net emissions expended as a result of the

Scheme equal 0.020% (from the period 2027-2037). Considering the magnitude of emissions and alignment with national and local climate change policy and net zero building standards, the whole life net effect is **minor adverse**, which is **not significant** in EIA terms.

19.9.7. Of the 17 potential risks to the **Scheme** as a result of climate change, six were considered to have a potentially significant effect. Owing to the good practice design measures that will be incorporated into the **Scheme**, including measures to address the risk of overheating and extreme weather, these effects were determined to be **negligible** and therefore **not significant** in EIA terms.

19.10. References

BEIS (2020) Energy White Paper: Powering our net zero future. [online] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/945899/201216_BEIS_EWP_Command_Paper_Accessible.pdf Accessed October 2024

BEIS (2021a) Net Zero Strategy: Build Back Greener. [Online] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf Accessed October 2024

BEIS (2021b). Heat and Buildings Strategy. [online] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1044598/6.7408_BEIS_Clean_Heat_Heat___Buildings_Strategy_Stage_2_v5_WEB.pdf Accessed November 2024

BEIS (2022) United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/943618/uk-2030-ndc.pdf Accessed November 2024

BSI (2023). PAS 2080: Carbon Management in Buildings and Infrastructure. Available: https://www.bsigroup.com/en-GB/insights-and-media/insights/brochures/pas-2080-carbon-management-in-infrastructure-and-built-environment/ Accessed November 2024

Climate Change Committee (2020) The Sixth Carbon Budget: The UK's path to Net Zero. [Online] https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf. Accessed October 2024

Department for Levelling Up, Housing and Communities (2023). National Planning Policy Framework. Available: https://www.gov.uk/government/publications/national-planning-policy-framework--2 Accessed November 2024

Department for Levelling Up, Housing and Communities (2024). The Future Homes and Buildings Standards: 2023 consultation. Available: https://www.gov.uk/government/consultations/the-future-homes-and-buildings-standards-2023-consultation Accessed November 2024

Department for Transport (2024). National Networks National Policy Statement. Available: https://assets.publishing.service.gov.uk/media/65e9c5ac62ff48001a87b373/national-networks-national-policy-statement-web.pdf Accessed November 2024

DESNZ and Defra (2024). Greenhouse gas reporting: conversion factors 2024. Available: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024 Accessed November 2024

DESNZ (2023). Powering Up Britain: The Net Zero Growth Plan. Available https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147457/powering-up-britain-net-zero-growth-plan.pdf Accessed November 2024

Highways England (2021). Design Manual For Roads and Bridges LA 114: Climate. Available: https://standardsforhighways.co.uk/tses/attachments/d1ec82f3-834b-4d5f-89c6-d7d7d299dce0?inline=true Accessed November 2024.

HM Treasury (2020). National Infrastructure Strategy. [online] https://assets.publishing.service.gov.uk/media/5fbf7591e90e077ee2eadc44/NIS_Report_Web_Accessible.pdf Accessed November 2024

IEMA (2020). Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation.

IEMA (2022). Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance. 2nd Edition.

IPCC (2013). AR5 Climate Change 2013: The Physical Science Basis. Available: https://www.ipcc.ch/report/ar5/wg1/ Accessed November 2024.

Jones and Hammond (2019). Inventory of Carbon and Energy (ICE) Database. Available at: https://circularecology.com/embodied-carbon-footprint-database.html Accessed November 2024

Met Office. (2020). UK Climate Averages. Available: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages Accessed November 2024.

Met Office (2024a) UK Climate Extremes. Available: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-extremes Accessed November 2024

Met Office (2024b) Past weather events: Exceptionally wet month for parts of the Midlands. Available: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2024/2024_07_september_rain.pdf Accessed November 2024

MOHC (2024). UK Climate Projections User Interface v2.11.0 Available: https://ukclimateprojections-ui.metoffice.gov.uk/ui/home. Accessed November 2024

National Highways (2024) Standards for Highways. Available: https://www.standardsforhighways.co.uk/mchw/ Accessed January 2025.

NWLDC (2019). Zero Carbon Roadmap. Available: https://www.nwleics.gov.uk/files/documents/nwldc_zero_carbon_roadmap_nov_2019/20190234-NWLDC%20Zero%20Carbon%20Roadmap-04-Main%20Report-Rev%20K%20-%20final.pdf Accessed November 2024

NWLDC (2020). Zero Carbon Roadmap Action Plan. Available: https://www.nwleics.gov.uk/files/documents/nwldc_zero_carbon_roadmap_action_plan_sept_2020/20190234-NWLDC%20Zero%20Carbon%20Roadmap-03-Action%20Plan-Rev%20M.pdf Accessed November 2024

NWLDC (2021). North West Leicestershire Local Plan. Available: https://www.nwleics.gov.uk/files/documents/north_west_leicestershire_local_plan_as_amended_by_the_partial_review1/Adopted%20Written%20Statement%202021%20-%20public%20copy%20%284%29.pdf Accessed November 2024

NWLDC (2024). Draft North West Leicestershire Local Plan 2020-2040. Proposed Policies for Consultation. https://www.nwleics.gov.uk/files/documents/proposed_policies/Reg%2018%20%28Policies%29%20for%20consultation_final.pdf Accessed November 2024

OneClick LCA (2023). Carbon Heroes Benchmarks.

OneClick LCA (2024). OneClick LCA Database.

RICS (2012). Standard IP 32/2012, Methodology to Calculate Embodied Carbon of Materials, 1st Edition, information paper. July 2012, London.

RICS (2023). Whole life carbon assessment for the built environment (2nd Edition). Available: https://www.rics.org/content/dam/ricsglobal/documents/standards/Whole_life_carbon_assessment_PS_Sept23.pdf Accessed November 2024

Tyndall Centre (2024). Setting Climate Commitments for North West Leicestershire: Quantifying the implications of the United Nations Paris Agreement for North West Leicestershire. Available: https://carbonbudget.manchester.ac.uk/reports/E07000134/ Accessed November 2024.

UK Green Building Council (2024). UK Net Zero Carbon Buildings Standard, Pilot Version rev1. Available: https://www.nzcbuildings.co.uk/_files/ugd/6ea7ba_558d6df150b448f084c5a98b94f88727.pdf

WRI and WBCSD (2004). The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. Revised edition, Washington and Geneva: WRI and WBCSD.