Chapter 14: Climate Change and Greenhouse Gases

TRIUM

CLIMATE CHANGE AND GREENHOUSE GASES	
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SUPPORTING APPENDIX	**ES Volume 3, Appendix: Climate Change and Greenhouse Gases** Annex 1: Climate Change Technical Note Annex 2: Policy and Guidance Background Annex 3: Extract from Whole Life-Cycle Carbon Assessment Annex 4: Extract from the Energy Statement Annex 5: Professional Experience
KEY CONSIDERATIONS	**PART A** by Trium Environmental Consulting LLP This Environmental Statement (ES) chapter addresses climate change resilience and adaptation. A future climate scenario has been developed through the use of the future climate projections published by the Met Office (through the UK Climate Projections (UKCP18) website). The results include projections for variables including annual mean temperatures, and annual changes in summer and winter precipitation. To describe the predicted future climate, a high emissions scenario (RCP8.5) for 2080 has been utilised as the future baseline. RCP8.5 has been used as it represents the most reasonable emissions scenario with regards to climate policy, land use, and technological development. The year 2080 is the timeframe considered most relevant to the Proposed Development. The projected change to the range of climatic conditions will adopt the 50% probability level, which is a central estimate adopted given the level of uncertainty associated with predicting the modelled scenarios. An assessment of the resilience of the Proposed Development to future climate change has then been carried out, following a methodology developed from Institute of Environmental Management and Assessment (IEMA) guidance. The assessment includes an overview of the climate change resilience and adaptation measures that have been factored into the design of the Proposed Development and an assessment of the residual effects of future climate hazards at receptors within the Proposed Development. In addition, in-combination climate change effects have also been assessed, as advised by IEMA in its guidance on the resilience and adaptation of projects to climate change[1]. IEMA defines 'in-combination' effects as: *"the extent to which climate exacerbates or ameliorates the effects of the project on the environment (i.e. 'in-combination' effects)"*. The future climate change scenario has been considered for each of the technical topics presented in this ES, and the level of assessment and methodology is proportional to the available evidence base. The aim of the assessment has been to consider whether the effect on receptors (under the current condition, without climate change) are likely to be different under an alternative future climate regime; in particular, to identify whether the potential impacts of the Proposed Development will be worse or improve under the future baseline, and therefore if these changes alter the significance of effects identified for the Proposed Development under the current condition (without climate change). **PART B** by Air Quality Consultants Ltd The Proposed Development will lead to the direct and indirect release of greenhouse gases (GHG), both during the demolition and construction stage, and throughout the lifetime of the Proposed Development. This assessment estimates the GHG associated with the Proposed Development taking a lifecycle approach and presents the mitigation measures and specific design measures provided by the scheme to minimise its GHG footprint. This is the effect of the Proposed Development on climate change.
CONSULTATION	An EIA Scoping Report was prepared and submitted to LBS on 11th January 2024 (ref: 20/AP/0749), requesting an EIA Scoping Opinion. The EIA Scoping Report is appended to this ES in **ES Volume 3, Appendix: EIA Methodology – Annex 1**. An EIA Scoping Opinion was issued by LBS on 27th March 2024 and is provided in **ES Volume 3, Appendix: EIA Methodology – Annex 2**, in which the methodology proposed for the climate change and greenhouse gases assessment was accepted and details of the chosen carbon budget and associated reasoning is provided, which has been addressed in paragraphs 14.141 to 14.148

PART A CLIMATE CHANGE RESILIENCE AND ADAPTATION

14.1 The approach to assessing the potential impact of climate change on the Proposed Development has been undertaken in accordance with the Institute of Environmental Management and Assessment's (IEMA's) guidance 'Climate Change Resilience and Adaption'[2], which presents a framework for the consideration of climate change resilience and adaption in the EIA process. It recognises a need for a proportionate approach to the assessment, due to the uncertainties associated with predicting how the environment will respond to climate change.

14.2 The guidance advises on inter alia, defining the future climate scenario, the integration of climate change adaption into the design, and the process for EIA. The guidance also provides advice on the execution of the impact assessment across the technical topics, including the identification of the climate related parameters which are likely to influence the project in question, and the anticipated changes to those parameters under a future climate scenario.

14.3 Consistent with the guidance, a future climate scenario has been developed through the use of the future climate projections published by the Met Office (through the UK Climate Projections (UKCP18) website[3]). The results include projections for variables including annual mean temperatures, and annual changes in summer and winter precipitation – refer to **ES Volume 3, Appendix: Climate Change and Greenhouse Gases – Annex 1**.

14.4 To describe the predicted future climate, a high emissions scenario (RCP8.5) for 2080 has been utilised as the future baseline. RCP8.5 has been used as it represents a conservative high emissions scenario. The year 2080 is the timeframe considered most relevant to the Proposed Development, this is relevant as an estimated operational lifetime of 60 years has been assumed, this is a typical assumption in accordance with British Standard EN 15978:2011[4]. The projected change to the range of climatic conditions has adopted the 50% probability level, which is a central estimate adopted given the level of uncertainty associated with predicting the modelled scenarios. This approach is in accordance with the IEMA Climate Change Resilience and Adaptation guidance, which states that "*Recommended best practice is to use the higher emissions scenario (RCP 8.5 in the latest UKCP18 projections) at the 50th percentile, for the 2080s timelines, unless a substantiated case can be made for not doing this (e.g. anticipated lifespan of the project is shorter than 2080s)".*

14.5 The future climate change scenario has been considered by each of the technical topics covered within this ES ('In-Combination Climate Change Impacts'), and the level of assessment and methodology is proportional to the available evidence base. The aim of the assessment has been to consider whether the effect on receptors (under the current condition, without climate change) are likely to be different under an alternative future climate regime; in particular, to identify whether the potential impacts of the Proposed Development will be worse or improve under the future baseline, and therefore if these changes alter the significance of effects identified for the Proposed Development under the current condition (without climate change). A key aspect of the assessment (for each of the technical topics considered) has been to identify the likely effect of those receptors considered more vulnerable to changes in climate, having taken into account the resilience and adaptive measures (being either design or management) which are proposed for the scheme in order to mitigate the risk presented by climate change.

14.6 Due to the level of uncertainty in both the future climate projections and how the future climate conditions may affect sensitive receptors, the assessment is qualitative (determining whether or not there is the risk of significant effects as a result of climate change impacts on/in conjunction with the Proposed Development), based on objective professional judgement, unless where there is published, accepted quantifiable methods available (i.e., in relation to the assessment of flood risk).

14.7 The final section of Part A presents the adaption and resilience measures proposed as part of the Proposed Development, in response to the projected future climate change scenario (as described below).

Historic and Existing Climate Conditions

14.8 The most recent State of the UK Climate Report[5] reviews current climate conditions against historic trends, summarised as follows:

- In comparison to the 20th century, recent decades have been warmer, wetter and sunnier;
- 2022 was the warmest year in the UK since 1884, 0.9°C above the 1991 – 2020 average;

[1] *IEMA (2020) IEMA EIA Guide to: Climate Change Resilience and Adaptation.*
[2] *IEMA (2020). Climate Change Resilience and Adaption*
[3] *https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/download-data*
[4] *British Standard BSEN 15978:2011. Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method.*
[5] *International Journal of Climatology (2022), State of the UK Climate 2022*

- The most recent decade (2013 – 2022) was 0.3°C warmer than the 1991 – 2020 average and 1.1°C warmer than the 1961 – 1990 average;
- In 2022 the UK had its driest summer since 1995;
- The most recent decade (2013 – 2022) has been on average as wet as 1991 – 2020 and 8% wetter than 1961 – 1990 for the UK;
- UK Winters for the most recent decade (2013 – 2022) have been 10% wetter than those in 1991 – 2020 and 25% wetter than in 1961 – 1990; and
- The number and severity of substantial snowfall events have generally declined since the 1960s.

Future Climate Change Scenario

14.9 The 2022 UKCP Headline Findings[6] highlights the key climate projections for the UK as follows:

- By the end of the 21st century, all areas of the UK are projected to be warmer, more so in summer than in winter;
- Hot summers are expected to become more common. The temperature of hot summer days, by the 2070s, show increases of 3.8°C to 6.8°C, under a high emissions scenario, along with an increase in the frequency of hot spells;
- Rainfall patterns across the UK are not uniform and vary on seasonal and regional scales and will continue to vary in the future;
- Significant increases in hourly precipitation extremes in the future;
- Despite overall summer drying trends in the future, future increases in the intensity of heavy summer rainfall events are likely;
- Future climate change is projected to bring about a change in the seasonality of extremes; and
- Sea levels rising.

14.10 The future climate of London is predicted to undergo significant change over the duration of the Proposed Development. Recent historical and current events such as the hot, dry summers of 2022 provide a demonstration of the conditions that are likely to become more frequent.

14.11 Annual Mean air temperature in London is predicted to rise by 1.04ºC during 2020 – 2039, and during the period of construction of the Proposed Development with completion by 2034. This rises to 1.87ºC between 2040 – 2059, 2.96ºC between 2060-2079 and 4.28ºC between 2080 – 2099, during much of the anticipated life span of the Proposed Development.

14.12 Rainfall in London is predicted to decrease by 8.66% during summer and rise by 7.35% in winter between 2020 – 2039; decrease by 19.99% during summer and rise by 11.42% during winter between 2040 – 2059; decrease by 29.04% during summer and rise by 17.90% in winter between 2060 – 2079; and decrease by 40.10% in summer and rise by 23.61 in winter between 2080 – 2099. In addition, annual precipitation is predicted to decrease by -1.92% by 2079 and -2.50% by 2099.

14.13 Further detail on the future climate change scenario that has been considered in this assessment based on the climate projections published by the Met Office (through the UK Climate Projections (UKCP18) website) is provided in **ES Volume 3, Appendix: Climate Change and Greenhouse Gases – Annex 1**.

[6] *UKCP (August 2022), UK Climate Projections: Headline Findings.*

In-Combination Climate Change Impacts

Socio-Economics

14.14 As set out above in Paragraph 14.9 a number of environmental factors are considered to experience potential variations in the future due to climate change. The Proposed Development has been designed to minimise the exposure of the resident, worker and visitor population to socio-economic issues which could be accentuated by climate change, specifically around the risk of effects to healthcare and open/play space demand. Therefore, whilst the baseline sensitivity might increase slightly at the general population level, it is not envisaged that the specific impact of the Proposed Development and its resident population would be adversely affected. These changes to future climatic conditions are not considered to have a significant effect upon the sensitive receptors within the socio-economic assessment with respect to the Proposed Development.

14.15 Therefore, potential effects related to climate change are not relevant to the assessment of socio-economic effects (**ES Volume 1, Chapter 6: Socio-Economics**).

Traffic and Transport

14.16 Climate change would not have a direct effect on the potential effects considered in **ES Volume 1, Chapter 7: Traffic and Transport**. However, changing travel behaviour in response to climate change concerns is expected to result in a switch to more sustainable modes of travel, lower emission vehicles and encourage advances in technology which in turn would support improved telecommuting and flexible working, reducing the scale of peak hour travel. A reduction in vehicle emissions and traffic volumes would have a benefit for pedestrian and cyclist amenity, fear and intimidation.

14.17 The Proposed Development, designed based on current behaviour patterns, is therefore considered to be resilient. Any future changes in travel patterns would serve to increase benefits for users of the site as well as residents, visitors and employees of the local area, although this benefit is not expected to be of a scale that would change the overall residual effects and their significance.

14.18 Therefore, the effects as presented in **ES Volume 1, Chapter 7: Traffic and Transport** would remain unchanged under the future climate scenario.

Air Quality

14.19 Air quality is predicted to improve in the future, owing to lower emissions from road vehicles and heating and cooling plant as progressively lower emission technologies become available.

14.20 The assessment focuses on the near-term (year of opening), but the outlook for the longer term is one of improvement, both in terms of local and regional air quality, but also in terms of emissions associated with the Proposed Development itself.

14.21 Climate change is a long-term effect, and whilst climate change may increase summer temperatures, which might affect dispersion, create temperature inversions and static atmospheric conditions, all of which may contribute to elevated concentrations, significant long-term changes in climate are not expected by 2028 (the first year of occupation assumed by the air quality assessment[7]). It is, however, not possible to robustly quantify the extent of any changes in climate in the short-term.

14.22 In the longer term (2050 – 2080) changes in climate might affect the need for additional heating and cooling and, therefore, may have an influence on the regional emissions associated with the Proposed Development, but significant effects are not expected as a result.

14.23 Overall, it is judged that any effects on dispersion as a result of climate change will be offset by improvements to air quality brought about by the UK's decarbonisation and improvements to vehicle technology. Therefore,

[7] *Whilst the earliest occupation year, as described in **ES Volume 1, Chapter 5: Demolition and Construction** is 2029, it has been assumed to be 2028, to ensure a worst-case assessment.*

the effects as presented in **ES Volume 1, Chapter 8: Air Quality** would remain unchanged under the future climate scenario.

Noise and Vibration

14.24 No climate change variables directly affect the assessments presented within **ES Volume 1, Chapter 9: Noise and Vibration**. Whilst temperature, or other variables may inadvertently influence the environmental noise and vibration climate, these changes are not considered quantifiable and do not warrant additional specific mitigation. The design of the heating and cooling plant equipment is to take this into account with appropriate mitigation included as necessary to maintain the noise emission limits provided in Table 9.33 of **ES Volume 1, Chapter 9: Noise and Vibration.**

Daylight, Sunlight and Overshadowing

14.25 The daylight assessment is based on an assumed overcast sky in accordance with BRE guidelines. The assessment is not related to frequency of overcast skies or any specific meteorological conditions and as such would not be affected by future climate change.

14.26 The sunlight assessment is a long-term assessment of sunlight exposure based on Annual Probable Sunlight Hours (APSH). Whilst future climate change predicts hotter, drier summers, it also predicts wetter winters and there are no future projections for APSH to suggest whether these will increase or decrease with future climate change. On balance it is likely that annual sunlight hours will remain broadly consistent.

14.27 The overshadowing assessment assesses the number of sun hours an area should receive. The assessment is based on the equinox in line with BRE guidance. Future climate change will not materially affect the potential number of sun hours at any given time of year (i.e. sunrise and sunset) and therefore would not affect the results of the overshadowing assessment.

14.28 Therefore, the effects as presented in **ES Volume 1, Chapter 10: Daylight, Sunlight and Overshadowing** would remain unchanged under the future climate scenario.

Wind Microclimate

14.29 The 'Climate Projects Report' published by UKCP18 presented the probable changes in wind speeds for the 2070-2099 period (timeframe considered most relevant for urban regeneration projects) in both the summer and winter seasons (see Climate Change Technical Note presented within **ES Volume 3, Appendix: Climate Change and Greenhouse Gases – Annex 1**).

14.30 As set out within this annex, the current trends in climate change are not likely to have significant effects on the predicted wind microclimate conditions in and around the Proposed Development. It is therefore not necessary to provide a quantitative analysis of the increase in storm frequency and its implication on the effect on the wind microclimate for the Proposed Development. The effects identified within the wind microclimate assessment (**ES Volume 1, Chapter 11: Wind Microclimate**) would remain unchanged under the 2080 future climate scenario.

Archaeology

14.31 The impacts of the Proposed Development have the potential to remove completely buried heritage assets relating to the Roman through to post-medieval agricultural remains and associated buildings and deeply buried prehistoric remains (the environmental effect being offset during the demolition and construction stage through agreed archaeological work). Therefore, climate change would have no effect on remains. While palaeoenvironmental remains would be vulnerable to changes in hydrology, specifically desiccation, increased rainfall could be beneficial for the preservation for any localised alluvial deposits, however no such deposits have been identified within the site.

14.32 The future climate change scenario considered above would not alter the findings and conclusions of the Proposed Development as set out in **ES Volume 1, Chapter 12: Archaeology**.

Ground Conditions

14.33 It is necessary to consider whether the effects of the Proposed Development on ground conditions will alter due to the predicted effects of climate change.

14.34 When assessing the effect of climate change on ground conditions, the key variable is the future effect and change in rainfall levels. For example, an increase in rainfall levels is likely to create an increase in pollution pathways for contaminants to reach controlled waters, thus leading to adverse effects on sensitive receptors.

14.35 The receptors that have been identified within **ES Volume 1, Chapter 13: Ground Conditions and Land Contamination** need to be considered in terms of their vulnerability (i.e. susceptibility or resilience to change) to the changes in the future climate. Table 14.1 below, gives a summary of the receptors, including their sensitivity classification and their vulnerability under these future climate conditions.

14.36 The vulnerability of a receptor is defined by the following classifications:

- High Vulnerability – the receptors directly dependent on existing and/or prevailing climatic factors and reliant on these specific existing climate conditions continuing in the future; or only able to tolerate a very limited variation in climate conditions;
- Moderate Vulnerability – the receptor is dependent on some climatic factors, but able to tolerate a range of conditions; and
- Low Vulnerability – climatic factors have little influence on receptors.

Table 14.1 Summary of Receptor Sensitivity and Vulnerability for Assessment

Receptor	Sensitivity	Vulnerability
Soils and Geology	Low	Moderate
Hydrology (River Peck)	Low	High
Hydrogeology	High	High
Human Health (construction workers and adjacent site users)	High	Moderate
Human Health (future site users and services maintenance staff)	High	Moderate
Infrastructure and Building Material	High	Moderate
Proposed Planting	High	High

14.37 Within **ES Volume 1, Chapter 13: Ground Conditions and Land Contamination**, the current and future baseline conditions and the impacts on controlled waters have already considered the predicted impact of climate change. For example, the WFD ecological status for the 'London' management catchment for the majority of waterbodies have 'Moderate' ecological status; however, the majority of waterbodies have a future objective of 'good' by 2027 and takes into account the future effect of climate change on water quality.

14.38 The proposed mitigation measures include the future effects of climate change and, therefore, once these measures are implemented, the Proposed Development will be considered safe in terms of future climate effects, and it would not have a deleterious effect on local soil or groundwater quality.

14.39 Overall, with the proposed mitigation measures identified, there will be no change to the findings and conclusions set out in **ES Volume 1, Chapter 13: Ground Conditions and Land Contamination**.

Built Heritage, Townscape and Visual

14.40 Changes expected from climate change, such as increased rainfall levels and temperatures, and decreased wind speed and cloud cover, are unlikely to impact on the appearance of the Proposed Development in views and its relationship to townscape character during the period of demolition and constructions works, or when

the Proposed Development is completed. Heritage, townscape and visual receptors are considered to be of low vulnerability to climatic factors. Therefore, the effects as stated in **ES Volume 2** will remain unchanged.

Adaptation and Resilience of the Proposed Development to Climate Change

14.41 The latest UK Climate Change Risk Assessment[8] identifies the key climate-related risk areas for action in the UK. The following have been identified as relevant to the Proposed Development:

- Risks to soil health from increased flooding and drought.
- Risks to people and the economy from climate-related failure of the power system.
- Risks to human health, wellbeing and productivity from increased exposure to heat in homes and other buildings.

14.42 Accordingly, and based on the future climate change scenario projections set out in **ES Volume 3, Appendix: Climate Change and Greenhouse Gases – Annex 1**, the main climatic factors that have influenced the evolution and design of the Proposed Development are temperature and precipitation. The design team have worked collaboratively to ensure climate change adaptation measures are incorporated into the design, which are discussed below.

Increase in Annual and Maximum Temperatures

Overheating of Buildings

14.43 In order to reduce overheating risk during periods of increase temperatures, the Energy Strategy for the Proposed Development has developed a mitigation strategy for managing heating and cooling, increasing the resilience to future climate change.

14.44 The Energy Strategy for the Proposed Development is driven by the local and national guidelines including the GLA Energy Plan 2022 which provides a London Energy Hierarchy (i.e. Be Lean, Be Clean, Be Green and Be Seen). The following mitigation methods will be implemented to minimise the internal heat generation through energy efficient design of the Proposed Development:

- Energy efficient lighting i.e. LED;
- Lowering the air permeability rate beyond the standardized values;
- Installation of heat recovery ventilation systems (Mechanical Ventilation Heat Recovery (MVHR)) which average 89% efficiency;
- Cooling provision through VRV (variable refrigerant volume) / VRF (variable refrigerant flow) systems to retail and office spaces.

14.45 The mitigation methods implemented to reduce the amount of heat entering the building in the summer months within the Proposed Development include developing facades with suitable glazing-to-solid ratios, strategic balcony placements on southern facades and reduction in window sizes where necessary to reduce solar gain.

Success of the Landscaping (and Biodiversity Benefits)

14.46 The increase in annual and maximum temperatures has the potential to damage soils (through periods of drought/drying out) and reduce the success of the proposed landscaping (and its biodiversity benefits). It is therefore critical to ensure that the landscape strategy is designed to be resilient to climate change, and that an adaptive management regime is implemented.

14.47 Green and biodiverse roofs play an important role in climate resilience and supporting local ecosystems and habitats. Given the green roofs proposed for the Proposed Development, they will contribute to the greening of London (in support of London Plan Policy G5).

14.48 The soft landscaping strategy (which includes large areas of green roofs and use of rain gardens as part of the Sustainable Urban Drainage (SuDS) strategy) will reduce the amount of hardstanding within the Proposed Development, which will reduce the 'Urban Heat Island' effect and allow areas of shading and cooling during instances of hot weather.

14.49 Measures to improve resilience include the incorporation of diverse tree species and a combination of native and adapted plant species, with high durability and low water demand, which will withstand future predicted temperatures and drier conditions.

14.50 A Habitat Management Plan (or similar) will be produced (secured via a suitably worded planning condition), and will facilitate the appropriate management of landscapes areas, which will mitigate the risk of failure of the landscaping and will assist in maintain the biodiversity benefits of the Proposed Development.

Climate-Related Failure of the Power System

14.51 An electric-led energy strategy is proposed, with the utilisation of Air Source Heat Pumps (ASHPs) and the use of high-performance Heat pumps/VRF for non-domestic areas for the provision of space heating, cooling and hot water. In addition, the installation of PV panels is included within the scheme to contribute to the reduction of the on-site carbon emissions. The Proposed Development also includes the provision of two life-safety diesel generators, for use during emergencies.

Increase in Precipitation / Intense Rainfall Events

Flood Risk

14.52 RMA Environmental have prepared a Flood Risk Assessment ('FRA') which has been submitted in support of the planning application. The Environment Agency's (EA) flood map for planning shows that the entire site is located within Flood Zone 1 (low risk) and therefore has little or no flood risk from rivers and/or the sea. The closest land within Flood Zone 2 (medium risk) is located approximately 320m to the north, at an elevation approximately 4m lower than the site and, therefore it is considered that the site will remain within Flood Zone 1 for its operational lifetime.

14.53 Additionally, the majority of the existing site has very low surface water flood risk as per the EA's surface water flood risk mapping. However, an area of ponding with up to a high surface water flood risk has been identified in the central western part of the existing site, along with the western half of the site located within an area with reservoir flooding during normal river levels.

14.54 Appropriate mitigation measures which form a part of the sustainable drainage system, including the redistribution of any surface water ponding to the new low points within the site (i.e. areas of open spaces and public realm) will be implemented and managed once the Proposed Development is complete and operational.

14.55 The impact of climate change on water management and surface water runoff have been considered as part of the Drainage Strategy, submitted in support of the planning application. The Drainage Strategy proposes that all drainage from the site is discharged via the outfalls to the east onto Rye Lane and to the north-west onto Peckham High Street. Surface water discharge will be restricted to greenfield runoff rates in line with the London Plan, and has been designed to not cause risk to person or property for storms up to and including the 1 in 100 year event, with an additional allowance of 40% due to climate change.

14.56 Sustainable drainage measures which are included in the Proposed Development include the following:

- Rainwater harvesting systems;

[8] *HM Government (2022), UK Climate Change Risk Assessment 2022*

- Provision of blue and green roofs across the site;
- Bioretention Systems in the form of rain gardens located within public realm;
- Areas of tree planting and development of green spaces, use of tree pit cell attenuation crates during Phase 1 to feed into underground geocellular attenuation tanks;
- Provision of attenuation storage tanks to manage the rate of water discharge to local public sewer network;
- Usage of permeable paving in hardscape strategy as a water quality SuDS feature; and
- Inclusion of detention basins in areas with lawns and perennial planting for additional storage during low probability storm events.

14.57 The FRA has demonstrated that the Proposed Development will be safe and that it would not increase flood risk elsewhere. The proposed development is considered appropriate in relation to the flood risk vulnerability classifications set out in Table 3 of the NPPF PPG and should therefore be considered acceptable in relation to current planning policy.

Part A Likely Significant Effects

14.58 In conclusion, under the future 2080 climate scenario, the residual effects of the Proposed Development would remain consistent with the effects identified as described throughout this ES and summarised in **ES Volume 1, Chapter 16: Likely Significant Effects** under the current climate conditions. It is considered by the design team that the adaptation and resilience measures set out above will address the future climate change scenario for the lifetime of the Proposed Development (2080) and no additional or different likely significant climate change adaptation/resilience related effects have been identified**.**

PART B GREENHOUSE GAS EMISSIONS ASSESSMENT

ASSESSMENT METHODOLOGY

14.59 This section of this ES chapter provides a Greenhouse Gas (GHG) assessment for the Proposed Development. The Proposed Development comprises the demolition of existing buildings and phased redevelopment to provide a replacement supermarket and associated service yard and car parking (Use Class E(a)); flexible retail, leisure (including drinking establishment), and commercial accommodation (Use Class E / Sui Generis); dwellings (Use Class C3); landscaping and associated works. A full description of the Proposed Development can be found in **ES Volume 1, Chapter 4: The Proposed Development**.

14.60 GHGs are gases which have the potential to increase atmospheric temperatures, and which contribute to climate change. The Proposed Development will lead to the direct and indirect release of GHGs, during the demolition and construction phase, and throughout its lifetime. This assessment estimates the GHG emissions associated with the Proposed Development taking a lifecycle approach and presents the embedded design measures provided by the scheme to avoid and reduce its direct and indirect GHG emissions.

Scope of the Assessment

14.61 The EIA Regulations require that EIAs have consideration to climate change and require that the assessment provides: *"A description of the likely significant effects of the development on the environment resulting from, inter alia… (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change".*

14.62 The impact of future climate change on the resilience of the Proposed Development has been addressed within Part A of this ES chapter. This assessment (Part B) covers the impacts of the project on climate through the quantification of GHGs resulting from the Proposed Development. This assessment provides an estimate of GHG emissions in the first year of occupation (2028)[9] and over the lifetime of the Proposed Development.

14.63 Relevant policy and guidance to this assessment is set out in **ES Volume 3, Appendix: Climate Change and Greenhouse Gases – Annex 2.**

Defining the Baseline

14.64 The site currently comprises the existing Aylesham Centre, alongside an associated surface car park (353 spaces), service yard and a petrol filling station. In addition, it comprises retail units fronting on to Rye Lane, with additional retail units within a covered mall, including a Morrisons supermarket.

14.65 The existing buildings will be demolished, the material from which includes embedded carbon. To provide a conservative assessment, the baseline is assumed to be zero, as the embedded carbon emissions associated with construction already reflect the net change. Baseline emissions associated with transport, maintenance activities and energy are also assumed to be zero, as the information was not available at the time the assessment was undertaken.

14.66 Assuming a baseline of zero across the existing site will result in a worst-case quantification of the net change in GHG emissions and allows for a conservative assessment.

Evolution of the Baseline

14.67 If the Proposed Development was not to come forward, it is expected that the site would remain in its current state for the foreseeable future.

14.68 Whilst the emissions from the existing site operations have not been quantified in this assessment, it is anticipated they would reduce in the future given the transition to a decarbonised economy in line with the UK Government's long-term strategy to aim for net zero GHG emissions by 2050.

14.69 For the purposes of this assessment, the future baseline emissions are assumed to be zero, as this represents the worst-case scenario as all GHG emissions are assumed to be new rather than replacing any existing emissions.

Impact Assessment Methodology

14.70 The assessment has taken a whole life approach to develop a GHG footprint for the Proposed Development. The footprint sources considered include GHG emissions:

- Embodied in the material used in the construction of the Proposed Development;
- From construction site activities (e.g., construction plant, site offices, welfare facilities, etc.);
- From traffic movements during the construction and operational phases;
- From energy consumed by the operation of the Proposed Development;
- From the operational repair, maintenance and refurbishment of the Proposed Development;
- From potable water supply and treatment during operation of the Proposed Development; and
- From deconstruction of the Proposed Development at the end of its lifetime.

14.71 GHG emissions from the disposal of waste generated by the Proposed Development have been scoped out of the assessment, due to uncertainties in input data and them contributing only a small amount to the total Proposed Development GHG footprint. The exclusion of this GHG source will not materially affect the GHG

[9] *Whilst the earliest occupation year, as described in **ES Volume 1, Chapter 5: Demolition and Construction** is 2029, it has been assumed to be 2028, to ensure a worst-case assessment.*

footprint or assessment conclusions and consideration to embedded design measures to minimise waste are provided in this assessment.

14.72 Table 14.2 sets out the GHG assessment scenarios examined by the assessment, key sources of data and methodologies used.

14.73 The metric for assessing the climate change impacts of GHG emissions in this assessment is Global Warming Potential (GWP). This is expressed in units of CO_2 equivalent (CO_2e) over 100 years. This allows for the emissions of the seven key GHG: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), nitrogen trifluoride (NF_3) and sulphur hexafluoride (SF_6) expressed in terms of their equivalent global warming potential in mass of CO_2e.

14.74 Emissions associated with the construction phase of the Proposed Development are calculated for the whole construction phase and annualised emissions based on the anticipated construction period, which is approximately nine years based on information in **ES Volume 1, Chapter 5: Demolition and Construction**. The construction phase GHG emissions have therefore been annualised assuming a 9-year construction phase.

14.75 The energy and transport GHG emissions associated with the current use(s) at the site and with the Proposed Development have been calculated for the opening year (whilst the earliest occupation year, as described in **ES Volume 1, Chapter 5: Demolition and Construction** is 2029, it has been assumed to be 2028, to ensure a worst-case assessment), taking account of national projections with regards to decarbonisation of the energy supply in the future, vehicle fleet composition, etc. Emissions associated with repair, maintenance and refurbishment have been assumed as zero.

14.76 The GHG assessment (using the methodologies referenced in Table 14.2) is based on an estimated operational lifetime of 60 years, which is a typical assumption for a development of this type and is in accordance with British Standard EN 15978:2011.

14.77 The 'net emissions' are the change in the GHG emissions between the baseline and the Proposed Development, taking account of GHG reduction measures. Offsetting of emissions is also considered in the calculation of residual net GHG emissions.

Table 14.2 GHG Assessment Scenarios

Development Phase	Baseline	Proposed Development	Methods and Data Sources	Reference
DEMOLITION AND CONSTRUCTION				
Embodied Carbon	The baseline is assumed to be zero.	Emissions associated with the extraction and processing of the materials required to construct the Proposed Development ('cradle to gate').	Module A1-A3 emissions as presented in the Whole Life Carbon (WLC) assessment	WLC Assessment[10]
Transport	The baseline is assumed to be zero.	Emissions associated with traffic generated by the demolition and construction works of the Proposed Development.	Module A4 emissions as presented in the WLC assessment.	WLC Assessment
Construction Site Activities	The baseline is assumed to be zero.	Emissions associated with energy consumption for site accommodation and plant use during the demolition and construction works.	Module A5 emissions as presented in the WLC assessment.	WLC Assessment
OPERATION				
Repair, Maintenance and Refurbishment	The baseline is assumed to be zero.	Emissions associated with the operational repair, maintenance and refurbishment of the Proposed Development.	Module B1-B5 emissions from use, repair, maintenance and refurbishment during the building's lifetime as presented in the WLC assessment.	WLC Assessment
Transport	The baseline is assumed to be zero.	Emissions associated with traffic generated by the operation of the Proposed Development in the opening year (2028).	Application of calculated 2028 GHG factors to km travelled by mode from transport assessment.	Transport Consultant
Energy	The baseline is assumed to be zero.	Emissions from energy use associated with operation of the Proposed Development, taking account of measures to reduce energy consumption and utilise renewable energy on-site.	CO_2 from energy use for the Proposed Development taking into account savings from the Energy Statement.	Energy Statement[11]
Water Supply and Treatment	The baseline is assumed to be zero.	Emissions associated with supply of potable water and treatment of wastewater.	Module B7 emissions as presented in the WLC assessment.	WLC Assessment
Deconstruction	n/a	Emissions associated with deconstruction and demolition activities of the Proposed Development.	Modules C1-C4 deconstruction/demolition; transport; materials re-used or recycled; and disposal emissions associated with demolition activities and generated waste.	WLC Assessment

Demolition and Construction

14.78 GHGs associated with the demolition and construction of the Proposed Development relate to those embodied in the materials from which it is constructed, and with traffic movements generated during the construction stage.

Embodied Carbon

14.79 Emissions from the manufacturing of construction materials have been sourced from the WLC assessment[10]. These correspond to modules A1-A3 of a carbon lifecycle assessment as defined in RICS[12] and Greater London Authority (GLA)[13] guidance.

Construction Traffic

14.80 Emissions from the construction traffic have been sourced from the WLC assessment[10]. These correspond to module A4 of a carbon lifecycle assessment as defined in RICS[12] and GLA[13] guidance.

Construction Site Activities

14.81 Emissions from energy consumption for site accommodation and plant use during construction works have been sourced from the WLC assessment[10]. These correspond to module A5 of a carbon lifecycle assessment as defined in RICS[12] and GLA[13] guidance.

Completed Development

14.82 GHGs associated with the operation of the Proposed Development relate to emissions from repair, maintenance and refurbishment, transport, energy use and water supply. There will also be emissions from the end-of-life phase.

[10] *Hodkison (2024) Whole Life Cycle Carbon Emissions Assessment*
[11] *M-E Engineers Limited (2024) Aylesham Centre - Energy Statement*
[12] *RICS(2017) Whole life carbon assessment for the built environment*
[13] *GLA (2020) Whole Life-Cycle Carbon Assessments guidance Pre-consultation draft (April 2020)*

Repair, Maintenance and Refurbishment

14.83 Over the lifetime of the Proposed Development there will be GHG emissions associated with the repair, maintenance and refurbishment[14] of the buildings. These emissions are effectively 'unregulated' as there is no policy or standard for establishing compliance nor are there published data on good practice against which developments can be benchmarked. Nonetheless, emissions from repair, maintenance and refurbishment have been considered in the GHG assessment based on modules B1-B5 within the WLC assessment[10].

Transport

14.84 GHG emissions factors for transport have been derived from the Department for Transport's (DfT's) WebTAG data book[15] and the Department for Energy, Security and Net Zero (DESNZ) GHG conversion factors[16]. The WebTAG data and GHG conversion factors have been used to derive GHG emissions for each year to 2050 for the purposes of calculating the Proposed Development's lifetime transport emissions. It has been assumed that, from 2050, the transport emissions are net zero in line with the UK Government's commitments to net zero carbon by 2050 (see earlier in this ES Chapter)

14.85 The calculation of transportation GHG emissions has been carried out by multiplying the transport GHG factors detailed in Table 14.3 by distanced travelled by mode (km), calculated using trip generation per mode data provided by the Applicant's Transport Consultant (Arup) and assumptions relating to the average distance travelled by mode taken from the LTDS[17].

Table 14.3 2028 Transport GHG Factors by Mode (selected modes)

Activity	Type	Unit	Calculated 2028 Factor (kg CO_2e)
Car	Average Car	km	0.1268
Motorcycle	Average motorcycle	km	0.0864
London Taxi	Black cab	km	0.2325
London Bus/Coach	Local London bus	Passenger.km	0.0695
Underground	London Underground	Passenger.km	0.0163
Vans	Average Van	km	0.193
HGV	All HGVs	km	0.715

Energy Consumption

14.86 CO_2 emitted as a result of the running of the energy systems employed by the Proposed Development have been taken from the Energy Statement[11]. Further detail on the CO_2 factors and CO_2 emissions from energy consumption is provided in the Energy Statement.

14.87 The assessment includes regulated energy consumption, which is energy consumption from heating and cooling, lighting, and on-site infrastructure such as lifts, and unregulated energy consumption, which is electricity consumption from the behaviour of the building's users, such as personal electrical appliances (phones, laptops, televisions etc.), and kitchen appliances. Energy consumption has been calculated using the information stated in the Energy Statement[11].

14.88 Data from the Energy Statement relate to annual emissions and have been used for the first year of occupation of the Proposed Development (2028). Lifetime emissions from energy have been calculated by decarbonising the annual energy emissions from the Energy Statement in line with Government projections[18] for the period between 2028 and 2050. Beyond 2050, emissions from energy are assumed to be zero in line with Government's net zero commitments (see Paragraphs 14.91 to 14.94).

Water Supply and Treatment

14.89 GHG emissions associated with water supply been obtained from the WLC assessment[10], which correspond to module B7 of the WLC assessment.

End of Life

14.90 Emissions associated with the end-of-life phase of the Proposed Development have been sourced from the WLC assessment[10]. These correspond to modules C1-C4 of the WLC assessment, and include emissions associated with:

- Site activities associated with the deconstruction and demolition of buildings;
- Transportation of demolition and deconstruction materials away from site;
- The treatment and processing of materials for re-use or recycling; and
- Final disposal of materials that are not re-used or recycled.

Net Zero Policy Implications

14.91 The UK has recently legislated a 2050 net zero target following recommendations and analysis completed by the Committee on Climate Change (CCC)[19]. The CCC's Net Zero report[20] has established a "Further Ambition" scenario which considers feasible and cost-effective policy and technology interventions to ensure the UK can meet its new net zero target.

14.92 For power generation under this scenario, the CCC consider that 100% of power generation by 2050 will be low carbon and for ground transport it forecasts that all ground transportation (apart from small number of HGVs) will be electrically powered. The CCC therefore forecast that power and ground transportation sectors are largely decarbonised by 2050 with any residual emissions removed through technical and or natural means.

14.93 The implications of the UK adopting the net zero target are that it is reasonable to assume that government policies will be brought forward to ensure the net zero target is achieved.

14.94 It is therefore anticipated that all operational energy and transportation emissions associated with the Proposed Development are likely to be zero by 2050 at the latest.

Assumptions and Limitations

14.95 The following assumptions and limitations are relevant to the GHG assessment:

- The Proposed Development is complete and operating at full capacity in 2028. As described in paragraph 14.75, whilst the earliest occupation year is 2029, the assessment has been undertaken using 2028 to ensure a worst-case scenario;
- The construction phase will be completed over a period of approximately nine years;
- Construction of the Proposed Development involves the buildings and infrastructure, and transport movements described in **ES Volume 1, Chapter 5: Demolition and Construction**;

[14] Refurbishment refers to ongoing refurbishment of elements of the buildings as required during its estimated 60-year lifetime and does not include a complete whole-building refurbishment, as this would occur at the end of the buildings' practical life and would be subject to a future lifecycle GHG assessment.
[15] DfT (2023) TAG data book November 2023 v1.22. Available: https://www.gov.uk/government/publications/tag-data-book
[16] DESNZ (2023) Greenhouse gas reporting: conversion factors 2023. Available: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023

[17] TfL (2022) London Travel Demand Survey: Workbook 2022/23.

[19] Net zero has been defined by the CCC to allow for GHG removals to offset any residual GHG emissions in 2050 so that the overall balance of emissions is zero.
[20] Committee on Climate Change (2019) Net Zero. The UK's contribution to stopping global warming, Available: https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/

- Measures set out within the Energy Statement[11] and Sustainability Statement[21] to minimise emissions from energy consumption and embodied carbon will be implemented; and
- The lifetime GHG emissions make a number of assumptions, led by Government data and strategies about decarbonisation of key emissions sources such as energy and transport.

Methodology for Defining Effects

Receptors and Receptor Sensitivity

14.96 The assessment of GHGs does not include identification of sensitive receptors, as GHG emissions do not directly affect specific locations or receptors but lead to indirect effects by contributing to climate change. Identification of sensitive areas for climate change has been undertaken by The Intergovernmental Panel on Climate Change (IPCC)[22]. Impacts on specific areas are not included within this assessment, since the impacts of GHG emissions will affect the global atmosphere, and therefore need to be considered in a total context, rather than on localised areas.

Magnitude of Impact

14.97 There are no impact descriptors for GHG emissions; the approach taken is therefore to consider the calculated GHG emissions relating to the Proposed Development (during the demolition, refurbishment and construction phase and once complete and operational) in the context of GHG emissions budgets for:

- The UK, as published by the DESNZ in the UK-wide carbon budgets[23];
- The GLA-wide area, as published within the London Environment Strategy Implementation Plan[24]; and
- The LBS, as published by the University of Manchester Tyndall Centre for Climate Change Research[25].

Defining the Effect

14.98 For GHG emissions there are no recognised criteria and thresholds that relate to the quantum of GHG emissions released.

Geographic Extent of Effects

14.99 The geographic extent of effects arising from the Proposed Development will extend beyond the Development boundary and could well extend across the entire country. GHG emissions and implications for climate change are commonly considered in a 'global' context.

Effect Duration

14.100 GHG emissions will be generated for the lifetime of the project (or at least up to 2050) by which time it might be expected that net GHG emissions will be zero. They are, therefore, considered to be permanent.

Direct and Indirect

14.101 The Proposed Development's GHG emissions will not have any direct environmental effects, but contribute to climate change, which is an indirect environmental effect.

Categorising Likely Significant Effects

14.102 In terms of defining significance, guidance from IEMA[26] has been adopted, which has identified three underlying principles to inform the assessment of significance, as follows:

- GHG emissions from all projects will contribute to climate change; the largest interrelated cumulative environmental effect;
- The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA Directive – e.g., population, fauna, soil, etc.; and
- GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be considered to be significant.

14.103 Based on these principles, IEMA conclude that:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact, however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

14.104 In advising on the significance of any net change in GHG emission resulting from a development IEMA identify that in order to limit the adverse effects from climate change global temperature change needs to be limited to well below 2°C, aiming for 1.5°C. The implication of this objective is that global emissions need to fall to net zero by 2050.

14.105 The UK's response to limiting climate change is enshrined in law through the Climate Change Act[5] which requires the UK economy to be net zero by 2050 following a trajectory set through five yearly carbon budgets. The 2050 target (and interim budgets set to date) are, according to the CCC, compatible with the required magnitude and rate of GHG emissions reductions required in the UK to meet the goals of the Paris Agreement, thereby limiting severe adverse effects.

14.106 It follows therefore that the significance of any net change of GHG resulting from a development is not so much whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions consistent with a trajectory towards net zero by 2050.

14.107 To establish the significance of the GHG emissions from a development therefore requires judgements on:

- Their consistency with policy requirements, since these have been specified to ensure the economy decarbonises in line with the UK's net zero target; and
- The degree to which the development has sought to mitigate its emissions.

Examining each of these dimensions allows the assessment to make professional judgement on the likely significance of effects based on a set of significance criteria established in the IEMA guidance, summarised in Table 14.4.

[21] *M-E Engineers Limited (2024) Aylesham Centre - Sustainability Statement*
[22] *The Intergovernmental Panel on Climate Change (2022), 'AR6 Climate Change 2022: Impacts, Adaptation, and Vulnerability'*
[23] *DESNZ (2021) Carbon Budgets. Available: https://www.gov.uk/guidance/carbon-budgets#setting-of-the-fourth-carbon-budget-2023-2027*
[24] *GLA (2023) London Environment Strategy Implementation Plan.*
[25] *The University of Manchester Tyndall Centre for Climate Change Research (2024) Setting Climate Commitments for Southwark. Available: https://carbonbudget.manchester.ac.uk/reports/E09000012/*
[26] *IEMA (2022), 'Assessing Greenhouse Gas Emissions and Evaluating their Significance.' 2nd Edition.*

Table 14.4 GHG Significance Criteria

Significance Rating	Description	Criteria to Determine Significance of Net GHG Emissions
Major Adverse	A project with Major Adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.	The project's net GHG impacts are: • Not mitigated or are only compliant with do-minimum standards set through regulation; and • Do not provide further reductions required by existing local and national policy for projects of this type.
Moderate Adverse	A project with Moderate Adverse effects falls short of fully contributing to the UK's trajectory towards net zero.	The project's net GHG impacts are: • Partially mitigated; and • May partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type.
Minor Adverse	A project with Minor Adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.	The project's net GHG impacts are: • Fully consistent with applicable existing and emerging policy requirements; and • In line good practice design standards for projects of this type.
Negligible	A project with Negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.	The project's net GHG impacts are: • Reduced through measures that go well beyond existing and emerging policy; and • Better than good practice design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050.
Beneficial	A project with Beneficial effects substantially exceeds net zero requirements with a positive climate impact.	The project's net GHG impacts are: • Below zero; and • It causes a reduction in atmospheric GHG concentrations, whether directly or indirectly, compared to the without-project baseline.

14.108 IEMA advise that:

- Major Adverse, Moderate Adverse and Beneficial effects should be considered significant in the context of EIA. Minor Adverse and Negligible effects are considered to be not significant;
- In the case of large-scale developments, irrespective of the level of mitigation, if net GHG emissions exceed 5% of UK or devolved administrations carbon budget, this is a level of change that is considered significant;
- Meeting the minimum standards set through existing policy or regulation cannot necessarily be taken as evidence of avoiding a significant adverse effect, and it is recommended therefore that the assessment also considers emerging policy/standards and the guidance of expert bodies such as the CCC on necessary policy developments, particularly for multi-phased projects with long timescales; and
- To aid decision making it is important to inform the decision maker about the relative severity of environmental effects such that they can be weighed in a planning balance. Therefore, it is essential to provide context for the magnitude of GHG emissions reported in the EIA in way that aids evaluation of these effects by the decision maker. IEMA advise that context can be provided through comparison of the whole life GHG emissions resulting from the development with national, local and sectoral totals, as well as carbon budgets.

14.109 Therefore, the assessment of significance is established over two steps as follows:

Step 1: Establish Context of GHG Emissions

14.110 Context for decision making is provided by comparing the net change in the whole life GHG emissions resulting from the development with local and regional GHG emissions totals, and carbon budgets.

Step 2: Determine Significance of Effects

14.111 Significance of effects is established through applying the criteria detailed in Table 14.4 based on professional judgement that considers:

- The consistency of the development with national, regional and local policies designed to limit GHG emissions and meet the UK's net zero target; and
- The robustness, timeliness and efficacy of mitigation measures proposed to avoid, reduce and compensate GHG emissions.

14.112 In terms of mitigation, IEMA recommends that mitigation should in the first instance seek to avoid GHG emissions. Where GHG emissions cannot be avoided, the development should aim to reduce the residual significance of a project's emissions at all stages. Where additional GHG emissions remain but cannot be further reduced at source, approaches should be considered that compensate the project's remaining emissions, for example through offsetting.

BASELINE CONDITIONS

Demolition and Construction

14.113 The existing buildings will be demolished, the materials from which will include embodied carbon. Any embodied carbon in the demolition materials is not additional to this project; the reuse of materials recycled during demolition results in a reduced requirement for new construction materials, and consequently a reduction in embodied carbon generated during construction. The baseline is assumed to be zero, as the embodied carbon emissions associated with construction already reflect the net change.

Completed Development

14.114 Baseline GHG emissions associated with repairs, maintenance and refurbishment, transport, energy consumption, as well as water supply emissions are assumed to be zero which is considered to be a worst-case assessment. This is a conservative assumption, as it is likely that the building would be occupied in future if the Proposed Development did not proceed and would thus generate emissions.

14.115 The estimated baseline GHG emissions is provided in Table 14.5. The total assumed baseline GHG emissions are zero tonnes/annum CO_2e.

Table 14.5 Summary of Baseline GHG Emissions

Development Phase		Baseline CO_2e Emissions (tonnes/annum)	Comment/Rationale
Demolition, Construction and Retrofit		0	Assumed to be zero, however, taken into account in embedded emissions from construction materials (as overall reduction in materials required as a result of reuse and recycling)
Operation	Repair, Maintenance and Refurbishment	0	Assumed to be zero, which is a conservative assumption.
	Transport	0	Assumed to be zero, which is a conservative assumption.
	Energy	0	Assumed to be zero, which is a conservative assumption.
	Water Supply	0	Assumed to be zero, which is a conservative assumption.
TOTAL		**0**	Construction + Operation

EMBEDDED MITIGATION

14.116 A range of mitigation measures are embedded into the design of the Proposed Development to avoid and reduce GHG emissions during its construction and operation, and once the Proposed Development is complete and operational.

Demolition and Construction

14.117 Reducing GHG emissions during demolition and construction works includes consideration of minimising the use of materials as well as the procurement of sustainable materials, with consideration of the embodied carbon footprint of the material, from the extraction of the raw materials to the production of the final construction products, and the transport of products between the factory and Proposed Development.

14.118 The Applicant will also develop a Demolition and Construction Environmental Management Plan (DCEMP) which will detail control measures and activities to be undertaken to minimise environmental effects, including matters regarding waste management, as well as energy and power usage. An Outline DCEMP has been prepared and submitted with the planning application, and a detailed DCEMP will be prepared at a later date and secured via a planning condition. In addition, according to the Circular Economy Statement[27], the Proposed Development will commit to divert 95% of non-hazardous construction, demolition and excavation waste from landfill to be either recycled or reused. Following a pre-redevelopment and pre-demolition audit, 100% of concrete and brick and 25% of bituminous materials will be recycled on-site and the Applicant has committed to a target of 20% of the total tonnage for reuse and recycling on-site.

Completed Development

Transport

14.119 The following measures are embedded within the design of the Proposed Development to influence sustainable travel behaviour from the site:

- The residential component of the Proposed Development will be 'car-free'. This will discourage the use of private cars and encourage the use of existing public transport options;
- The adoption of a Workplace & Residential Travel Plan[28] setting out measures to encourage sustainable means of transport (public, cycling and walking) via offers such as cycle to work schemes, promotion and encouragement of participation in national cycle to workday/week campaigns, as well as offers for season ticket loans;
- 1,609 long stay secure cycle spaces will be provided, as well as 256 short stay cycle spaces;
- All the short stay spaces will be provided in the form of Sheffield stands, all of which will be provided within the public realm; and
- The Proposed Development will provide improvements to the public realm and streetscape to enhance the pedestrian experience.

14.120 In addition, the Proposed Development will also adopt measures set out within a Delivery & Servicing Plan[28], which will aim to facilitate sustainable freight travel to and from the site, as well as promote smarter operations that reduce the need for freight travel overall or that reduce or eliminate trips, particularly during peak periods.

14.121 The GHG emissions saving benefits of these measures are embedded into the Proposed Developments' GHG footprint set out in this ES chapter.

14.122 Overall, the site itself is in a highly accessible location (PTAL score of 6a/6b) and so is accessible to a wide range of transport services, being in close proximity to a number of bus, underground and rail routes.

Energy Consumption

14.123 The Proposed Development incorporates a suite of design measures to maximise energy efficiency, reduce energy demand and generate and supply renewable energy, including:

- An all-electric energy strategy with no gas supply to the Proposed Development, including Air Source Heat Pumps (ASHPs) and Use of high-performance Heat pumps/VRF for non-domestic areas;
- Integration of openable elements in the façades allowing occupants to benefit from fresh air and to reduce reliance on cooling during the summer months;
- High efficiency glazing, fabric specification and air tightness specified throughout to minimise total heating and cooling energy requirements; and
- Energy-efficient equipment will be used throughout the Proposed Development to reduce energy consumption.

14.124 The GHG emissions saving benefits of these measures are embedded in the Proposed Development's GHG footprint set out in this chapter.

POTENTIAL EFFECTS

Demolition, Construction and Retrofit

Embodied Carbon

14.125 The total embedded CO_2e emissions for the Proposed Development, as presented in modules A1-A3 of the WLC assessment[10], are 52,188 tonnes; based on a 9-year construction programme this equates to 5,799 tonnes/annum.

14.126 Since the Proposed Development is to be constructed on land that is already developed, and does not lead to a loss in habitat, forest or agricultural land, no land use change GHG emissions are assumed to occur.

Transport

14.127 The total CO_2e emissions from transport during construction of the Proposed Development, as presented in module A4 of the WLC assessment[10], are 1,456 tonnes, based on a 9-year construction programme this equates to 162 tonnes/annum.

Site Activities

14.128 The total embedded CO_2e emissions from site activities during construction of the Proposed Development, as presented in module A5 of the WLC assessment[10], are 5,260 tonnes, based on a 9-year construction programme this equates to 584 tonnes/annum.

Completed Development

Repair, Maintenance and Refurbishment

14.129 GHG emissions from repair, maintenance and refurbishment during the Proposed Development's lifetime have been sourced from the whole life-cycle assessment[10] (modules B1-B5) and are 28,670 tonnes, or 478 tonnes/annum based on a lifetime of 60 years.

Transport

14.130 The assessment of transport related GHG emissions for the completed Proposed Development in the opening year are presented in Table 14.6. The assessment multiplies the calculated 2028 GHG emission factors for each mode of travel (see Table 14.3) by the distance travelled per mode. Distance travelled was calculated from the number of trips and the average distance travelled per mode as advised by the Transport Consultant.

[27] *Hodkison (2024) Circular Economy Statement – Aylesham Centre*

[28] *Arup (2024) Transport Assessment – Aylesham Centre*

Table 14.6 Assessment of GHG Emissions from Operational Transport

Mode	Emission Factors CO_2e per km or passenger km (from Table 14.3)	Distance Travelled per Annum (km) [a] Completed Proposed Development	CO_2e Tonnes (per annum) [b] 2028 Opening Year	Lifetime CO_2e Emissions Tonnes
Underground	0.0163	6.180,534	101	464
London Bus/Coach	0.0695	2,218,262	154	1,877
Car	0.1268	15,965,021	2,024	27,894
London Taxi	0.2325	134,890	31	432
Motorcycle	0.0864	374,149	32	445
Cycle	0	626,423	0	0
Walk	0	466,044	0	0
Vans	0.193	568,922	110	1,723
HGV	0.715	190,700	93	1,913
TOTAL	-	**16,540,360**	**2,588**	**35,480**

[a] Except national rail, underground and bus, which are passenger km.
[b] CO_2e emissions are calculated by multiplying distance travelled by CO_2e factors by mode from Table 14.3.

Energy Consumption

14.131 The CO_2 emissions from energy consumption of the Proposed Development are described in the Energy Statement[11]. The Energy Statement compares the Proposed Development to a notional "baseline" of compliance with Part L Building Regulations.

14.132 Table 14.7 summarises the improvement in performance for the Proposed Development for regulated CO_2 emissions, taking into account measures to address the Mayor's Climate Change Strategy to be lean, be clean, be green.

Table 14.7 Assessment of CO_2 Emissions from Energy Consumption [a]

Item	Domestic (Tonnes CO_2 per annum)	Non-domestic (Tonnes CO2 per annum)	Site-wide (Tonnes CO2 per annum)
REGULATED EMISSIONS			
Baseline: Part L compliance	511	66	577
After energy demand reduction (be lean)	379	51	430
% Improvement	26%	23%	25%
After heat network connection (be clean)	281	42	323
% Improvement	45%	36%	44%
After renewable energy (be green)	281	42	323
% Improvement	0%	0%	0%
Net Emissions [b]	281	42	323
Overall % Improvement over Baseline: Part L compliance	45%	36%	44%
UNREGULATED EMISSIONS			
With Energy Strategy	282	37	319
REGULATED AND UNREGULATED			
Net Emissions [b]	563	79	642

Item	Domestic (Tonnes CO_2 per annum)	Non-domestic (Tonnes CO2 per annum)	Site-wide (Tonnes CO2 per annum)

Notes
[a] As described in the Energy Statement[11]
[b] Net emissions do not take into account offsets to meet GLA target zero carbon, which are discussed in the Mitigation section of this ES chapter.

14.133 Table 14.7 shows that the domestic and non-domestic regulated components of the Proposed Development will achieve a 45% and 36% improvement, respectively, in carbon emissions over Part L 2021 compliance, which is above the Mayor's target of 35% improvement.

14.134 Unregulated emissions do not require specific target reductions compared to a nominal baseline under the London Plan[29]. The London Plan requires all residual regulated emissions to be offset to zero, and so the Proposed Development will provide offsetting to further reduce the carbon emissions from regulated energy consumption. Carbon offsetting is discussed in the mitigation section of this report. The London Plan also requires that minimum of 10% and 15% reductions in domestic and non-domestic emissions are met through energy efficiency measures; the Proposed Development meets both the domestic target (26%) and the non-domestic target (23%).

14.135 To comply with the London Plan[29], the cash in-lieu contribution to offset regulated CO_2 emissions has been calculated within the Energy Statement[11] as £799,453.

Water Supply and Treatment

14.136 GHG emissions associated with water supply and treatment during the operational phase of the Proposed Development, as presented in module B7 of the WLC assessment[10], are 142 tonnes; this equates to 2 tonnes per annum based on a 60-year lifetime.

End of Life

14.137 The total embedded CO_2e emissions associated with the end-of-life stage of the Proposed Development, as presented in modules C1-C4 of the WLC assessment[10], are 4,104 tonnes. All of these emissions will occur at the end of the Proposed Development's life, and it is likely, due to decarbonisation of the economy to meet the net zero 2050 target, that there will be mechanisms in place to ensure these are at least net zero. In any case, they have been reported for completeness, but are not considered in the assessment of opening year emission.

Total GHG Emission Footprint

14.138 Table 14.8 summarises the GHG emissions for the Proposed Development in the opening year for each footprint element. The GHG emissions from embedded materials used in construction are annualised based on the duration of the demolition, construction and retrofit works (assumed to be 8 years (see Paragraph 14.74) and a 60-year life. Annualising the embedded GHG emissions allows them to be compared on a like-for-like basis to the operational GHG emissions which are reported on a per annum basis.

14.139 As shown in Table 14.8, the Proposed Development will result in a net increase in GHG emissions in the opening year of 10,257 tonnes.

Table 14.8 GHG Footprint for Proposed Development for Opening Year [a]

Development Stage	Footprint Element	Baseline (tonnes CO_2e per annum)	Opening Year (tonnes CO_2e per annum)	Lifetime Emissions (tonnes CO_2e)
Construction	Embedded	0	5,799	52,188
	Transport	0	162	1,456
	Site Activities	0	584	5,260

[29] *GLA (2021) The London Plan 2021*

Development Stage	Footprint Element	Baseline (tonnes CO_2e per annum)	Opening Year (tonnes CO_2e per annum)	Lifetime Emissions (tonnes CO_2e)
Operation	Repair, Maintenance and Refurbishment	0	478	28,670
	Energy	0	642	4,819
	Transport	0	2,588	35,480
	Water Supply and Treatment	0	2	142
TOTAL		**0**	**10,257**	**128,043**
End of Life	Demolition; Waste transport, processing and disposal	0	0	4,104

Notes:
[a] *All figures are rounded.*
[b] *All emissions to occur at the end of the life of the Development. This is not an annualised value.*

GHG Comparisons

14.140 As detailed in paragraph 14.104, the IEMA guidance has been adopted to determine the likely significant effects of the Proposed Development and considers the following three underlying principles to inform the assessment of significance.

Step 1: Establish Context of GHG Emissions

14.141 The first step in determining the likely significant effects is to contextualise the Proposed Development's net GHG emissions to the UK-wide carbon budget[23], the GLA-wide GHG emissions total[24], and the LBS's borough-wide GHG emissions total[25]. This can be done for the demolition, refurbishment and construction phase of the Proposed Development, as well as once complete and operational.

14.142 It should be noted that the LBS's carbon budgets include emissions for energy consumption only; thus, a comparison of the Proposed Development's GHG emissions (including emissions from various other sources) to the budget present a worst-case scenario.

Demolition and Construction Phase GHG Comparison

14.143 The demolition, refurbishment and construction period has been based on 9 years.

14.144 Table 14.9 shows the GHG comparison between the demolition, refurbishment and construction phase of the Proposed Development against the respective carbon budgets for the UK[23], GLA area[24] and the LBS[25]. As shown, the Proposed Development will comprise no greater than 3% (when rounded) of GHG emissions from any budget, which is a commensurate contribution for a major development of this nature.

Table 14.9 GHG Comparison – Demolition and Construction Phase

	Budget (MT CO_2e)	Proposed Development GHG Emissions (MT CO_2e)	% Comparison of Budget
2023 – 2027 (4th Budget)			
LBS-wide	2.3	0.013	0.6
GLA-wide	22.4		0.06
UK-wide	1,950		0.0007
2028 – 2032 (5th Budget)			
LBS-wide	1.2	0.033	2.7
GLA-wide	18.0		0.2
UK-wide	1,725		0.002
2033 – 2037 (6th Budget)			
LBS-wide	0.6	0.013	2.2
GLA-wide	-		-
UK-wide	965		0.001

14.145 It should be noted that all GHG emissions from the demolition, refurbishment and construction phase of the Proposed Development are included in the budget comparisons, which is conservative as embedded carbon emissions are not considered within the GLA budget, and the LBS budget considers energy emissions only.

Completed and Operational Phase GHG Comparison

14.146 As previously discussed in this ES Chapter the Proposed Development is anticipated to be first occupied in 2028 (see Paragraph 14.82).

14.147 Table 14.10 shows the GHG comparison between the complete and operational Proposed Development against the respective carbon budgets for the UK[23], GLA area[24] and the LBS[25]. As shown, the Proposed Development will comprise no greater than 2% (when rounded) of GHG emissions from any budget, which is a commensurate contribution for a major development of this nature.

Table 14.10 GHG Comparison – Complete and Operational Proposed Development

	Budget (MT CO_2e)	Proposed Development GHG Emissions (MT CO_2e)	% Comparison of Budget
2028 – 2032 (5th Budget)			
LBS-wide	1.6	0.016	1.0
GLA-wide	18.0		0.09
UK-wide	1,725		0.0009
2033 – 2037 (6th Budget)			
LBS-wide	0.9	0.012	1.3
GLA-wide	-		-
UK-wide	965		0.0012

14.148 As above, it should be noted that all GHG emissions from the complete and operational Proposed Development are included in the budget comparisons, which is conservative.

GLA WLC Benchmarks

14.149 Part F of the London Plan Policy SI 2 requires major applications to produce a WLCA, in accordance with GLA guidance[11] and demonstrate actions to reduce life cycle carbon emissions. The GLA guidance includes benchmarks for carbon performance.

14.150 The WLCA[10] produced to support the planning application demonstrates that the Proposed Development achieves the current GLA benchmarks for construction (Module A) and Modules B-C (excluding B6 and B7). Overall, Modules A-C (excluding B6 and B7) meet the current GLA benchmark for both the retail and residential buildings (<1,200 kg CO_2e/m^2 GIA). However, the Proposed Development does not meet the aspirational GLA benchmarks for neither Module A nor Modules B-C (excluding B6 and B7).

Step 2: Determine Significance of Effects

Consistency with Policy

14.151 The second step in determining the likely significant effects is to contextualise the Proposed Development's GHG emissions against policy, which is described in the following sections.

National Policies

14.152 In terms of national policy, the key national policy is the National Planning Policy Framework (NPPF)[30]. Paragraphs 159 b), 160 and 162 are of particular relevance to the GHG assessment, which are all within Part 14 of the NPPF.

14.153 Paragraph 159 b) requires that: "*New development should be planned in ways that can help reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.*"

14.154 The Proposed Development has been designed using an energy efficient, fabric-first approach as described in the Energy Statement[11]. A range of measures have been implemented into the design, as discussed in Paragraph 14.123, to directly or indirectly reduce GHG emissions.

14.155 Paragraph 160 requires that: "*To help increase the use and supply of renewable and low carbon energy and heat, plans should: a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts); b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for colocating potential heat customers and suppliers.*"

14.156 Although this strictly applies to development plans and therefore overlaps with local policies, discussed later in this section, the Proposed Development will employ the use of renewable energy (principally ASHPs and the use of high-performance heat pumps/VRF for non-domestic areas) within the building. The Proposed Development therefore complies with Paragraph 160 of the NPPF.

14.157 Paragraph 162 requires that: "*In determining planning applications, local planning authorities should expect new development to: a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.*"

14.158 Compliance with the local development plan is discussed in the following paragraphs, but as set out in the Energy Statement[11], the Proposed Development will be designed to ensure energy efficiency of building fabrics is maximised to maximise energy efficiency and reduce energy consumption, supplemented with renewable energy as needed to meet the requirements of Policy SI 2 of the London Plan and relevant LBS Local Plan policies. As such the Proposed Development does not conflict with Paragraph 162 of the NPPF.

14.159 In addition to the NPPF, it is appropriate to review how the Proposed Development aligns with national commitments to net zero by 2050. The CCC[31] has established a "balanced net zero pathway" which considers feasible and cost-effective policy and technology interventions to ensure the UK can meet its new net zero target.

14.160 For power generation under this scenario, the CCC consider that 100% of power generation by 2050 will be low carbon and for ground transport it forecasts that all ground transportation (apart from small number of HGVs) will be electrically powered. The CCC therefore forecast that power and ground transportation sectors are largely decarbonised by 2050 with any residual emissions removed through technical and or natural means.

14.161 It is therefore reasonable to assume that national policy measures will ensure that energy and transport emissions relating to the Proposed Development will be decarbonised, consistent with the UK's net zero target. The recent government announcement bringing forward the ban on sale of new vehicles that are not electrically powered to 2035 is an example of policy that is being developed. In addition, as described in the Energy Statement, the Proposed Development will adopt an all-electric energy strategy, ensuring the Proposed Development is fully net zero ready in accordance with CCC advice and projections.

14.162 Importantly the Proposed Development has adopted measures that are supportive of national policies to meet net zero. Specifically, this includes:

- Adopting a fabric-first approach to design to minimise energy demand;
- Development of an all-electric energy strategy, with no use of fossil fuels; and
- Delivering a 'car-free' scheme, when considering the residential aspect of the Proposed Development, with a focus on ensuring the majority of building users travel by sustainable or active modes of travel.

14.163 The Proposed Development has been demonstrated to be able to decarbonise in line with Government trajectories (see Paragraph 14.161) and will therefore not conflict with efforts to meet the national net zero target.

14.164 Overall, it is demonstrated that the Proposed Development complies with the requirements of national planning policy relevant to GHG emissions.

Regional Policies

14.165 The Mayor of London published the current 'London Plan' in March 2021. This is the Spatial Development Strategy for Greater London. The Development Plan for each London borough must ultimately comply with the general requirements of the London Plan[29].

14.166 The London Plan includes planning policies both for reducing energy consumption within buildings and, more significantly, for promoting the use of decentralised electricity generation and renewable energy technologies. These policies cover the requirements of each borough with respect to energy strategies and planning applications.

14.167 The London Plan recognises that energy efficiency should come before energy supply considerations and has suggested a simple strategy known as the Energy Hierarchy (Policy SI 2). The process follows good practice in the design of low carbon buildings and comprises four distinct stages and order of application:

- 1. Use Less Energy (Be Lean);
- 2. Supply Energy Efficiently (Be Clean);
- 3. Use Renewable Energy (Be Green); and
- 4. Monitor, verify and report on energy performance (Be Seen).

14.168 This strategy puts energy efficiency/conservation measures first to reduce the demand for energy, 'Be Lean'. Following this, consideration must be given to supplying the resultant reduced energy demand as efficiently as possible, including to exploit local energy resources (such as secondary heat) and supply energy efficiently, 'Be Clean'. Sources of low or zero carbon and renewable energy technologies should then be examined for incorporation, 'Be Green'. Lastly, it is a requirement for developments to monitor and report energy performance post-construction to ensure that the actual carbon performance of the development is aligned with the Mayor's net zero carbon target, 'Be Seen'.

14.169 The London Plan requires a minimum on-site reduction of at least 35 per cent beyond Part L 2013 Building Regulations and non-residential development should achieve a 15 per cent reduction through energy efficiency measures alone. The policy also requires all development to achieve net zero, through offsetting residual emissions as necessary.

14.170 The Energy Statement[11] explains how the Proposed Development will comply with Policy SI 2 of the London Plan, through delivery of an energy efficient design with 26% and 23% reduction, in domestic and non-domestic emissions, against Part L from energy efficiency measures and through offsetting as a cash in-lieu contribution to offset regulated CO_2 emissions (calculated at £799,453) to achieve net zero emissions from energy consumption.

[30] *Department for Levelling Up, Housing & Communities (2023) National Planning Policy Framework.*

[31] *CCC, (2019). Net Zero, Technical report.*

Local Policies

14.171 LBS's Local Plan[32] was adopted in February 2022. The following policy is applicable to the GHG assessment.

14.172 Policy P70 'Energy' states:

> *"All Development*
>
> *Energy Hierarchy*
>
> *1. Development must minimise carbon emissions on site in accordance with the following energy hierarchy:*
>
> 1. *Be lean (energy efficient design and construction); then*
> 2. *Be clean (low carbon energy supply); then*
> 3. *Be green (on site renewable energy generation and storage)*
>
> *Major Development*
>
> *2. Development must reduce operational greenhouse gas emissions and minimise both annual and peak energy demand. This must be in accordance with the following energy hierarchy:*
>
> 1. *Be lean (energy efficient design and construction); then*
> 2. *Be clean (low carbon energy supply); then*
> 3. *Be green (on site renewable energy generation and storage); then*
> 4. *Be seen (monitor, verify and report on energy performance); then*
> 5. *Offset residual carbon emissions to reach zero carbon target.*
>
> *3. Major development must be net-zero carbon.*
>
> *4. Major residential development must reduce carbon emissions on site (100% on 2013 Building Regulations). In exceptional circumstances, any shortfall must be secured off site through planning obligations or as a financial contribution.*
>
> *5. Major non-residential development must reduce carbon emissions on site by a minimum of 40% on 2013 Building Regulations. Any shortfall must be secured off site through planning obligations or as a financial contribution.*
>
> *6. Development proposals referable to the Mayor must calculate whole life cycle carbon emissions through a nationally recognised assessment and demonstrate actions taken to reduce life cycle carbon emissions."*

14.173 The Proposed Development complies with the requirements of Policy P70 by:

- Production of a detailed Energy Statement[11] for the Proposed Development assessing the design and performance of the building against the Mayor's Energy Hierarchy;
- Adopting an energy efficient design, zero-emission ASHP heating and PV energy to achieve a 45% and 36% reduction in domestic and non-domestic, respectively, regulated carbon dioxide emissions below the Part L 2021 Building Regulations baseline; and
- Offsetting the remaining emissions through a cash in lieu contribution (see Paragraph 14.135).

14.174 The Proposed Development complies with the requirements of relevant national, regional and local policies relevant to GHGs.

Mitigation Assessment

14.175 Table 14.11 sets out an assessment of the Proposed Development's approach to mitigation against the mitigation principles described in IEMA guidance, to avoid and reduce GHGs where practicable and compensate for any residual emissions. Embedded mitigation measures are summarised in paragraphs 14.116 to 14.124 and additional mitigation measures are described in paragraphs 14.180 to 14.181.

Table 14.11 Proposed Development Approach to Mitigation in Accordance with IEMA Mitigation Principles

Development Stage	Embedded Mitigation	Additional Mitigation
Construction	Reuse of material where possible. Minimising waste to landfill. Good practice measures to minimise energy use from construction activities. Consideration to use of construction materials with low embedded carbon. Development of a DCEMP, Project Waste Management Plan. And Construction Logistics Plan (CLP).	n/a
Operation: Repair, Maintenance and Refurbishment	N/A	It is anticipated that materials used in repair, maintenance and refurbishment will be sourced sustainably and in line with relevant policy requirements at the time the works are undertaken.
Operation: Transport	Measures are adopted into the design of the Proposed Development that aim to reduce car journeys and encourage low/zero carbon alternatives (e.g., cycling/walking). A Travel Plan will also be implemented to promote sustainable transport.	n/a
Operation: Energy	Energy saving measures to meet the Mayor's climate change strategy, which requires 35% carbon reduction beyond Building Regulation. Non-residential developments should aim to achieve 15% through energy efficiency measures alone. The Proposed Development includes a 45% reduction against Part L 2013, of which 28% is through energy efficiency measures.	Regulated emissions will be reduced to zero via offset payment, in line with GLA guidelines.

14.176 The mitigation measures set out in Table 14.11 are judged to represent good practice and be proportionate and consistent with developments of this scale and type.

Assessment of Significance

14.177 Table 14.12 summarises the residual significance of effects of the Proposed Development's GHG emissions, following the IEMA approach summarised in Table 14.4.

14.178 The assessment considers the context of the Proposed Development's GHG emissions, as well as the compliance of the Proposed Development will relevant national and local policies and the robustness, timeliness and efficacy of the mitigation to avoid and reduce GHG emissions.

Table 14.12 Proposed Development Assessment of Effects in Accordance with IEMA Guidance

IEMA Step	Description	Assessment	Alignment with IEMA Guidance (Table 14.4)
Step 1	Context	The Proposed Development's emissions are a small component of national, regional and local GHG emissions budgets. The Proposed Development provides net zero regulated energy emissions through offsetting and can decarbonise in line with national trajectories to net zero.	Minor Adverse: Fully in line with measures necessary to achieve the UK's trajectory towards net zero.
Step 2	Consistency with Policy	The Proposed Development has been demonstrated to meet the requirements of national, regional and local policies relating to GHG emissions and climate change.	Minor Adverse: The Proposed Development is fully consistent with applicable existing policy requirements.
	Robustness, timeliness and efficacy of mitigation	The Proposed Development has adopted good practice measures to avoid and reduce GHG emissions during the construction phase and over the lifetime of its operation. The majority of the measures to avoid and reduce GHGs are designed in and will therefore be delivered during construction or from the occupation of Proposed Development onwards.	Minor Adverse: The GHG mitigation provided by the Proposed Development is in line with best practice design standards for projects of this type.

[32] *LBS (2022) The Southwark Plan 2019-2036*

14.179 Although the Proposed Development contributes to local and national GHG emissions, it is considered that these have been minimised through an appropriate degree of mitigation consistent with best practice and IEMA guidance, and ensures the Proposed Development is compliant with the UK's target for net zero carbon emissions by 2050. The Proposed Development has been demonstrated to meet all relevant policies related to GHG emissions and climate change. Based on the significance criteria set out in Table 14.4, it is therefore judged that the Proposed Development will have a Minor Adverse impact on GHG emissions, and the effect is 'not significant'.

MITIGATION, MONITORING AND RESIDUAL EFFECTS

14.180 Additional mitigation measures and environmental management strategies that will help directly or indirectly reduce GHG emissions during construction and operation of the Proposed Development are summarised in the following sections. The measures set out below are additional to the embedded mitigation measures described in Paragraphs 14.116 to 14.124.

Completed Development

Energy Consumption

14.181 To comply with Policy SI 2 of the London Plan and Policy P70 of the LBS' Local Plan, carbon offset payments will be provided to offset residual regulated CO_2 emissions to zero percent of Part L of the Building Regulations.

Residual Effects

14.182 The residual effects are the same as those identified in the main assessment of potential effects. The GHG effects associated with the Proposed Development are Minor Adverse and 'not significant'.

ASSESSMENT OF THE FUTURE ENVIRONMENT

Evolution of the Baseline Scenario

14.183 If the Proposed Development were not to come forward, the site would remain in its current state. The emissions from the existing site operations have not been quantified in this assessment, although it is anticipated they would reduce in the future given the transition to a decarbonised economy in line with the UK Government's long-term strategy to aim for net zero GHG emissions by 2050.

14.184 Whilst any new development in the local area will lead to an incremental increase in GHG emissions in the shorter term, with decarbonisation of the national grid, increased take up and improvements in low or zero carbon transport technology and continued improvements in building designs, these changes are likely to ensure the UK reaches net zero emission by 2050, as required by the UK Climate Change Act Amendment 2019.

Cumulative Effects Assessment

14.185 GHG emissions from all projects will contribute to climate change; globally, not just locally. As set out in the IEMA guidance:

"Effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other".

14.186 This statement relates to 'cumulative' on a global scale. The definition of 'cumulative effects' in the context of GHGs and climate change therefore goes far beyond the typical definition of cumulative effects for EIA, which tends to focus on other proposed projects in the vicinity of the Proposed Development.

14.187 The EIA has identified 24 cumulative schemes in the assessment (see **ES Volume 1, Chapter 2: EIA Methodology**). It is difficult to quantify the GHG emissions from each of these cumulative schemes and as discussed above, cumulative contributions to climate change from GHGs will extend well beyond these schemes. It is expected that mitigation will be provided, principally for embodied carbon during construction and operational energy and transport, which are policy compliant and work to minimise the on-site GHG emissions and reduce the lifetime GHG emissions of each cumulative scheme.

14.188 The residual cumulative GHG emissions from the cumulative schemes and the Proposed Development will likely be small in the context of local, regional and national GHG emissions, but as part of the wider cumulative effects of GHG emissions from all local, regional, national and global sources are nonetheless judged to be 'not significant' in accordance with IEMA guidance.

PART B LIKELY SIGNIFICANT EFFECTS

14.189 The GHG assessment has identified that the Proposed Development will lead to GHG emissions, however, these are described as Minor Adverse and therefore 'not significant' in accordance with IEMA best practice guidance on the assessment of GHGs for EIA.

14.190 This conclusion is based on the GHG emissions generated by the Proposed Development being small in the context of local and regional emissions and GHG budgets, the Proposed Development being compliant will all relevant policies relating to GHG and climate change, and the fact that the Proposed Development will not conflict with or prevent the UK meeting its net zero GHG emissions target of 2050.

14.191 Mitigation is provided to avoid and reduce GHG emissions, which follows the key principles of GHG mitigation in the IEMA guidance and which is consistent with the requirements of relevant policy.