STRIDE TREGLOWN

Environmental Statement: Chapter 9 – Air Quality

Ellel Holiday Village, Lancaster

Ellel Holiday Village LLP

9. Air Quality

9.1. Introduction

9.1.1 This chapter prepared by Apex Acoustics assesses the impact of the proposed development on local air quality. This includes a summary of the methods used to assess the impacts, the baseline conditions currently existing at the site and surroundings, and the potential direct and indirect impacts of the proposed development arising from fugitive dust emissions during construction. Road traffic exhaust emissions associated with vehicles travelling to and from the site during operation are also assessed, with mitigation measures required to prevent, reduce, or offset the impacts and the residual impacts presented towards the end of this chapter.

9.2. Planning Policy Context

Legislation

9.2.1 The Air Quality Standards Regulations (2010) came into force on 11th June 2010 and include Air Quality Limit Values (AQLVs) for the following pollutants:

- Nitrogen dioxide (NO2);
- Sulphur dioxide;
- Lead;
- Particulate matter with an aerodynamic diameter of less than 10µm (PM10);
- Particulate matter with an aerodynamic diameter of less than 2.5µm;
- Benzene; and,
- Carbon monoxide.

9.2.2 Target Values were also provided for an additional 5 pollutants. These include:

- Ozone;
- Arsenic;
- Cadmium;
- Nickel; and,
- Benzo(a)pyrene.

9.2.3 Part IV of the Environment Act (UK Government, 1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007 .The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that area not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determinations of compliance vary.

9.2.4 **Table 9-1** presents the AQOs for pollutants considered within the assessment.

Table 9-1: Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration (µg/m³)	**Averaging Period**
NO_2	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM_{10}	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum

9.2.5 **Table 9-2** summarises the advice provided in DEFRA guidance on where the AQOs for pollutants considered with this Chapter apply.

Table 9-2: Examples of where air Quality Objectives Apply

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean	All locations where the annual mean objective would apply, together with hotels Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

Local Air Quality Management

9.2.6 Under Section 82 of the Environment Act (Part IV) (1995) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in **Table 9-2**, are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

Dust

9.2.7 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (UK Government, 2016) and subsequent amendments, such as construction sites, is that provided in Section 79 of Part III of the Environmental Protection Act (UK Government, 1990). The Act defines nuisance as:

"*any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance,"*

9.2.8 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (UK Government, 1990). The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

National Planning Policy Framework

9.2.9 The revised National Planning Policy Framework (NPPF) was published in February 2019 and sets out the Government's planning policies for England and how these are expected to be applied.

9.2.10 The purpose of the planning system is to contribute to the achievement of sustainable development. In order to ensure this, the NPPF recognises three overarching objectives, including the following of relevance to air quality:

"*An environmental objective - to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."*

9.2.11 Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

[…]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality […]"

9.2.12 The NPPF specifically recognises air quality as part of delivering sustainable development and states that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

9.2.13 The implications of the NPPF have been considered throughout this assessment.

Planning Practice Guidance

9.2.14 The National Planning Practice Guidance (NPPG) web-based resource was launched on 6th March 2014 and updated on 1st November 2019 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. What air quality considerations does planning need to address?
2. What is the role of plan-making with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?
5. When could air quality considerations be relevant to the development management process?
6. What specific issues may need to be considered when assessing air quality impacts?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?

9.2.15 These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

Local Planning Policy

9.2.16 Lancaster City Council (LCC) formally adopted its Local Plan on 29th July 2020. This comprises two strategic documents, including Part One: Strategic Policies and Land Allocations Development Plan Document (DPD) and Part Two: Development Management DPD . These documents will shape the future of the Lancaster district up until 2031.

9.2.17 A review of the Part One: Strategic Policies and Land Allocations DPD indicated the following policy of relevance to this report:

Policy EN9 EN11: AQMAs

"The Council has designated three AQMAs within the district in order to improve levels of air quality. These AQMAs are identified on the Local Plan Policies Map in the following locations:

- *EN9.1 – Central Carnforth*
- *EN9.2 – Central Lancaster*
- *EN9.3 – Galgate*

Developments that are located within or adjacent to AQMAs will be expected to ensure that they do not contribute to increasing levels of air pollutants within the locality and adequately protect their users from the effects of poor air quality.

Any development proposal will be expected to have regard to all relevant policies contained within the Local Plan, in particular Policy DM31 of the Development Management DPD which relates to development and air quality."

9.2.18 A review of the Part Two: Development Management DPD indicated the following policies of relevance to this report:

Policy DM30: Sustainable Design

"Sustainable design has an important role to play in improving the overall sustainability performance of new development, offering opportunities to deliver improved efficiency and reduced environmental impacts. The Council is supportive of proposals that deliver high standards of sustainable design and construction. In delivering sustainable development the Council will encourage development to deliver high standards of sustainable design and construction through consideration of:

I. Measures to reduce energy consumption and carbon dioxide emissions, and water consumption;

II. Opportunities for energy supply from on-site, decentralised, renewable or low carbon energy systems;

III. Opportunities to contribute to local and community-led energy initiatives;

IV. Account of landform, layout, building orientation, massing and landscaping to minimise energy, water consumption and water efficiency measures;

V. Use of materials that reduce energy demand (for example, insulation) and increase the energy efficiency of the building/development; and VI. The reuse of existing resources (including the conversion of existing buildings) where this would be 'fit for purpose."

Policy DM31: Air Quality Management and Pollution

9.2.19 All development proposals must demonstrate that they have sought to minimise the levels of air polluting emissions generated and adequately protect their new users, and existing users, from the effects of poor air quality.

9.2.20 Development which is located within an AQMA, or any development which has the potential to, individually or cumulatively, contribute to increasing levels of air pollution, will be required to demonstrate how either on-site or off-site mitigation measures will be put in place to reduce the air quality impact. Any proposal must not significantly worsen any emissions or air pollutants in areas where pollution levels are close to objective/limit value levels.

9.2.21 Proposals should contribute towards delivering the actions detailed within the Lancaster District Air Quality Action Plan, once in place. Any proposal must not worsen any emissions or air pollutants in areas that could result in a breach of, or worsen site-level critical loads for ecosystems within relevant Internationally designated nature conservation sites during both construction and operational phases. Air Quality Assessments must be submitted for relevant development proposals, as outlined in the Council's Validation Guide.

9.2.22 All development proposals will be expected to take account of the Council's forthcoming SPD on Low Emissions and Air Quality."

9.2.23 The above policies have been considered throughout this assessment by considering potential air quality effects as a result of the proposals.

Low Emission and Air Quality Planning Advisory Note

9.2.24 LCC have produced a Low Emission and Air Quality Planning Advisory Note (PAN) in order to provide guidance on air quality considerations that should be made in relation to new developments. The PAN focusses on measures to reduce transport related emissions from proposals in the district and was taken into consideration throughout the chapter.

Air Quality Action Plan for Lancaster

9.2.25 LCC have produced an 'Air Quality Action Plan for Lancaster' . This outlines the Council's commitment to identify and assess options for improving air quality within central Lancaster and highlights how these may be implemented.

9.3. Approach to Assessment

Methodology

9.3.1 The proposed development has the potential to cause air quality impacts during the construction and operational phases. These have been assessed in accordance with the following methodology.

Construction Phase

9.3.2 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the IAQM document 'Guidance on the Assessment of Dust from Demolition and Construction V1.1' .

9.3.3 Activities on the proposed construction site have been divided into three types to reflect their different potential impacts. These are:

- Earthworks;
- Construction; and,
- Trackout.

9.3.4 The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and,
- The risk of health effects due to a significant increase in exposure to PM10.

9.3.5 The first stage screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment proceeds to the next stage. Additionally, should ecological receptors be identified within 50m of the site, or the construction vehicle route up to 500m from the site entrance, then the assessment also proceeds to the next stage.

9.3.6 The second stage of the assessment screens the risk of potential dust impacts. A site is initially allocated an effect significance (risk) category based on two factors:

- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity; and,
- The scale and nature of the works, which determines the magnitude of dust arising as low, medium or high.

9.3.7 The two factors are combined in order to determine the potential effect significance without the mitigation applied.

9.3.8 The influencing factors that define the sensitivity of the area around a development to potential impacts as shown in **Table 9-3**.

Table 9-3: Construction dust - Examples of factors defining sensitivity of an area

Receptor Sensitivity	Examples	
	Human Receptors	**Ecological Receptors**
High	Users expect high levels of amenity High aesthetic or value property People expected to be present continuously for extended periods of time Locations where members of the public are exposed over a time period relevant to the AQO for PM_{10}. e.g. residential properties, hospitals, schools and residential care homes	Internationally or nationally designated site e.g. Special Area of Conservation
Medium	Users would expect to enjoy a reasonable level of amenity Aesthetics or value of their property could be diminished by soiling People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	Nationally designated site e.g. Sites of Special Scientific Interest
Low	Enjoyment of amenity would not reasonably be expected Property would not be expected to be diminished in appearance Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads	Locally designated site e.g. Local Nature Reserve

9.3.9 The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and,
- Any known specific receptor sensitivities which go beyond the classifications given in the document.

9.3.10 These factors were considered in the undertaking of this assessment.

9.3.11 The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in **Table 9-4.**

Table 9-4: Construction dust - Sensitivity of the area to dust soiling effects on people and property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

9.3.12 **Table 9-5** outlines the criteria for determining the sensitivity of the area to human health impacts

Receptor Sensitivity	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m^3	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m^3	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m^3	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m^3	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	Greater than 32µg/m^3	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m^3	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m^3	More than 10	Low	Low	Low	Low	Low
		1 -10	Low	Low	Low	Low	Low
	Less than 24µg/m^3	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low

Receptor Sensitivity	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
Low	-	1 or more	Low	Low	Low	Low	Low

9.3.13 **Table 9-6** outlines the sensitivity of the area to ecological impacts.

Table 9-6: Construction dust - Sensitivity of the area to ecological impacts

Receptor Sensitivity	Distance from the Source (m)	
	Less than 20	Less than 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

9.3.14 The scale and nature of the construction works determine the magnitude of dust impacts arising from each activity. The relevant criteria are summarised in **Table 9-7**.

Table 9-7: Construction dust - Magnitude of emission

Magnitude	Activity	Criteria
Large	Earthworks	Total site area greater than 10,000m^2 Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) More than 10 heavy earth moving vehicles active at any one time Formation of bunds greater than 8m in height More than 100,000 tonnes of material moved
	Construction	Total building volume greater than 100,000m^3 On site concrete batching Sandblasting
	Trackout	More than 50 Heavy Duty Vehicle (HDV) trips per day Potentially dusty surface material (e.g. high clay content) Unpaved road length greater than 100m
Medium	Earthworks	Total site area 2,500m^2 to 10,000m^2 Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one time Formation of bunds 4m to 8m in height Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	Total building volume 25,000m^3 to 100,000m^3 Potentially dusty construction material (e.g. concrete) On site concrete batching
	Trackout	10 to 50 HDV trips per day Moderately dusty surface material (e.g. high clay content) Unpaved road length 50m to 100m

Magnitude	Activity	Criteria
Small	Earthworks	Total site area less than 2,500m^2 Soil type with large grain size (e.g. sand) Less than 5 heavy earth moving vehicles active at any one time Formation of bunds less than 4m in height Total material moved less than 20,000 tonnes Earthworks during wetter months
	Construction	Total building volume less than 25,000m^3 Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	Less than 10 HDV trips per day Surface material with low potential for dust release Unpaved road length less than 50m

9.3.15 The dust emission impact magnitude and the sensitivity of the area is combined to determine the impact significance. This is explained in the Significance Criteria Section.

Operational Phase

9.3.16 The proposed development has the potential to impact on existing air quality as a result of road traffic exhaust emissions, such as NO2 and PM10, associated with vehicles travelling to and from the site. Potential impacts were defined by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios:

- 2018 - Verification;
- Opening year Do-Minimum (DM) (predicted traffic flows in 2023 should the proposed development not proceed); and,
- Opening year Do-Something (DS) (predicted traffic flows in 2023 should the proposed development be completed).

9.3.17 The DM scenario (i.e. without the proposed development) included baseline traffic data, inclusive of anticipated growth, for the relevant assessment year. The DS scenario (i.e. with the proposed development) included baseline traffic data, inclusive of anticipated growth for the relevant assessment year, in addition to predicted traffic associated with the operation of the proposed development.

9.3.18 For the purpose of the assessment traffic data for 2023 was utilised as the proposed development opening year. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2018 were utilised within the dispersion model. The use of 2023 traffic data and 2018 emission factors is considered to provide a worst-case scenario and therefore the predicted pollution concentrations are likely to overestimate actual levels during the operation of the proposed development.

9.3.19 Reference should be made to **Appendix 9.1** for assessment input data and details of the verification process.

9.3.20 Locations sensitive to potential changes in off-site pollutant concentrations were identified within 200m of the highway network in accordance with the guidance provided within the DMRB on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance on where the AQOs apply, as summarised in **Table 9-2**, was utilised to determine worst-case receptor positions in the vicinity of links likely to be affected by changes in traffic flows as a result of the propoed development.

9.3.21 The sensitivity of receptors to potential changes in pollutant concentrations as a result of road vehicle exhaust emissions is outlined in **Table 9-8.** It should be noted that these are based on the values provided within the IAQM guidance with additional descriptors in ensure consistency throughout the ES.

Table 9-8 - Operational Phase Receptor Sensitivity

Receptor Sensitivity	Pollutant Concentration at Receptor in Assessment Year
Very High	110% or more of AQO
High	103 – 109% of AQO
Medium	95 – 102% of AQO
Low	76 – 94% of AQO
Very Low	75% or less of AQO

9.3.22 The magnitude of predicted air quality impacts was calculated based on the predicted concentration change between DM and DS scenarios as a proportion of the AQO. This is outlined in **Table 9-9.**

Table 9-9: Operational Phase Magnitude of Impact

Predicted Concentration Change as a Proportion of AQO (%)	Magnitude of Impact
0	Negligible
1	Low
2 - 5	Medium
6 - 10	High
More than 10	Very High

9.3.23 It should be noted that the categories in **Table 9.9** are intended to be used by rounding the change in percentage pollutant concentration to whole numbers.

9.4. Significance Criteria

9.4.1 The significance of potential effects was determined by integrating the assessments of sensitivity and impact magnitude in a reasoned way. This is described separately for the construction and operational phase impacts in the following Sections.

Construction Phase

9.4.2 The dust emission magnitude and the sensitivity of the area were combined to determine the significance of the unmitigated effects.

9.4.3 **Table 9-10** outlines the effect significance from earthworks and construction activities.

Table 9-10: Construction Dust - Effect Significance from Earthworks and Construction Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

9.4.4 **Table 9-11** outlines the effect significance from trackout.

Table 9-11: Construction Dust - Effect Significance From Trackout Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible

9.4.5 It should be noted that all construction dust impacts are classified as adverse as they relate to a deterioration in baseline air quality.

9.4.6 Site specific mitigation measures were identified from the IAQM guidance to reduce potential dust impacts based upon the predicted effect significance. For sites with negligible effects, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice and can be secured through the submission of a construction Environment Management Plan (CEMP) should outline planning permission be granted.

9.4.7 The significance of residual impacts was determined based on the dust effect significance and appropriate mitigation measures. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible, hence the residual effect will normally be negligible. This is regarded as not significant with respect to the Town and Country Planning (Environmental Impact Assessment) Regulations.

Operational Phase

9.4.8 For operational phase road vehicle exhaust emissions impacts, the interaction between the magnitude of impact and sensitivity of the receptor was utilised to define the significance of the effect, as outlined in **Table 9.12.**

Table 9.12: Operational Phase Road Vehicle Exhaust Emissions - Effect Significance

Receptor Sensitivity	Magnitude of Impact			
	Low	**Medium**	**High**	**Very High**
Very Low	Negligible	Negligible	Minor	Moderate
Low	Negligible	Minor	Moderate	Moderate
Medium	Minor	Moderate	Moderate	Major
High	Moderate	Moderate	Major	Major
Very High	Moderate	Major	Major	Major

9.4.9 Following the prediction of impacts at discrete receptor locations, the IAQM document provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:

- The existing and future air quality in the absence of the proposed development;
- The extent of current and future population exposure to the impacts; and,
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

9.4.10 The IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is moderate or major, the effect is likely to be considered significant in regards the EIA Regulations , whilst if the impact is minor or negligible, the impact is likely to be considered not significant in regards the EIA Regulations.

Assumptions / Limitations

9.4.11 A number of air quality factors are likely to change in future years and therefore act as limitations to the assessment, these include:

- Background pollutant concentrations are predicted to decrease in future years as a result of Government policies and legislation to reduce pollutant emissions. However, there is current uncertainty over the level of likely decrease. As such, a worst-case assumption that air quality conditions do not improve in the future was adopted to ensure robust results; and,
- Road traffic exhaust emissions are predicted to decrease in future years with changes to the UK's vehicle fleet in line with Government legislation. However, similarly to background concentrations, there is current uncertainty over the level of likely decrease. As such, a worst-case assumption that emission factors do not improve in the future was adopted to ensure robust results.

9.4.12 A number of assumptions have been made in the undertaking of the assessment. These include the following:

- The meteorological data used for the assessment is representative of the conditions at the site;
- The background concentrations used for the assessment are representative of baseline annual mean pollutant concentrations at the site;
- The traffic data obtained for the purpose of the assessment is accurate;
- The road widths and speeds applied to traffic data are accurate;
- The emissions factors obtained from the Emission Factor Toolkit, as described in **Appendix 9.1** and used in the assessment of operational phase road traffic exhaust emissions, are representative of the vehicle emissions;
- The monitoring data used in the assessment was accurate;
- The total building volume will be more than 100,000m3; and,
- The unpaved length of roads on-site during the construction phase will be more than 100m.

9.5. Baseline Conditions

Introduction

9.5.1 Existing air quality conditions in the vicinity of the proposed development were identified in order to provide a baseline for assessment. These are detailed in the following Sections.

Local Air quality Management

9.5.2 As required by the Environment Act, LCC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO2 are above the AQO within the city. As such, three AQMAs have been declared. The closest of these to the proposed site is described as follows:

"*Galgate AQMA - An area encompassing properties along both sides of the A6 Main Road in Galgate, extending.*"

9.5.3 The proposed development is located approximately 760m south-west of the AQMA. As such, there is the potential for vehicles travelling to and from the site to increase pollution levels in this sensitive area. This has been considered throughout the assessment.

9.5.4 LCC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMAs have been designated.

Background Concentrations

9.5.5 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire UK to assist LAs in their Review and Assessment of air quality. The proposed development is located in grid square National Grid Reference (NGR): 348500, 454500. Data for this location was downloaded from the DEFRA website for the purpose of the assessment and is summarised in **Table 9.13**.

Table 9.13 - Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration (µg/m^3)		
	2018	**2020**	**2023**
NO_2	12.72	11.56	10.04
PM_{10}	10.40	10.19	10.00

9.5.6 As shown in **Table 9.13**, predicted background NO2 and PM10 concentrations are below the relevant AQOs at the site.

Local Air Quality Monitoring Data

9.5.7 Monitoring of pollutant concentrations is undertaken by LCC throughout their area of jurisdiction. Recent results from the closest survey positions to the site are shown in **Table 9.14**. Exceedences of the relevant AQO are shown in bold.

Table 9.14: Monitoring Results

Monitoring Site		Monitored NO_2 Concentration (µg/m^3)		
		2016	**2017**	**2018**
V	Galgate	**42**	38	33
Z	Galgate	**42**	37	33
ZA	Galgate	31	27	26
ZB	Galgate	29	24	24
ZC	Galgate	37	34	31

9.5.8 As shown in **Table 9.14**, annual mean NO2 concentrations were above the AQO at the V and Z Galgate sites in 2016. As these are positioned at roadside locations within an AQMA, exceedences are to be expected. It should be noted that annual mean NO2 concentrations have decreased below the AQO at all locations in 2017 and 2018. Reference should be made to **Figure 9**.1 for a map of the survey positions.

9.6. Air Quality Receptors

9.6.1 A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for dust and road vehicle exhaust emission impacts in the following Sections.

Construction Phase Sensitive Receptors

9.6.2 Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 350m from the site boundary. These are summarised in **Table 9.15.**

Table 9.15: Construction Dust - Earthworks and Constrction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Less than 20	10 - 100	1
Less than 50	10 - 100	1
Less than 100	More than 100	-
Less than 350	More than 100	-

9.6.3 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the site access. These are summarised in **Table 9.16.**

Table 9-16: Construction Dust - Trackout Dust Sensitive Receptors

Distance from Site Access Route (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Less than 20	10 - 100	0
Less than 50	More than 100	0

9.6.4 The ecological receptor identified in **Table 9.15** is the Lancaster Canal which runs through the proposed development. Although the Lancaster Canal is not an officially designated site, it has been included as an ecological receptor following consultation with the Canal and River Trust .

9.6.5 A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in **Table 9.17**

Table 9.17: Additional Area Dust Sensitivity Factors to Potential Dust Impacts

Guidance	Comment
Whether there is any history of dust generating activities in the area	The desk top study did not indicate any dust generating activities in the local area
The likelihood of concurrent dust generating activity on nearby sites	A review of the planning portal did not indicate any additional development proposals likely to result in concurrent dust generation in the vicinity of the site

Guidance	Comment
Pre-existing screening between the source and the receptors	Trees and shrubs are located sporadically along the site boundary. These may act as a barrier between emission sources and receptors should they be retained during the construction phase
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	As shown in **Figure 10.2**, the predominant wind bearing at the site is from the west with significant frequencies from the south-east. As such, receptors to the east and north-west of the boundary are most likely to be affected by dust releases
Conclusions drawn from local topography	There are no significant topographical constraints to dust dispersion
Duration of the potential impact, as a receptor may become more sensitive over time	Currently it is unclear as to the duration of the construction phase. However, it is likely that it will extend over one year
Any known specific receptor sensitivities which go beyond the classifications given in the document	No specific receptor sensitivities identified during the baseline assessment

9.6.6 Based on the criteria shown in **Table 9.17**, the sensitivity of the receiving environment to potential dust soiling and health impacts is classified as high. This was because identified receptors included residential properties.

9.6.7 As the identified ecological receptor is not a designated site, the sensitivity was classified as low.

9.6.8 The sensitivity of the receiving environment to specific dust impacts is shown in **Table 9.18**.

Table 9.18: Sensitivity of the Surrounding Areas to Specific Dust Impacts

Potential Impact	Sensitivity of the Surrounding Area		
	Earthworks	**Construction**	**Trackout**
Dust Soiling	High	High	High
Human Health	Low	Low	Low
Ecological	Low	Low	-

9.6.9 It should be noted that trackout activities will not take place within the relevant screening distance from the Lancaster Canal.

Operational Phase Sensitive Receptors

9.6.10 Receptors sensitive to potential road vehicle exhaust emission impacts were identified from a desk top study and are summarised in **Table 9.19.**

Table 9.19: Operational Phase Road Vehicle Exhaust Emissions Sensitive Receptor Locations

Receptor		NGR (m)	
		X	Y
R1	Residential - A6, Preston Lancaster Road	348938.9	452681.5
R2	Residential - A6, Preston Lancaster Road	348772.8	453022.3
R3	Residential - A6, Preston Lancaster Road	348699.0	453317.7
R4	Residential - A6, Preston Lancaster Road	348622.6	453696.1
R5	Residential - Whams Lane	349423.7	453246.2
R6	Residential - Whams Lane	349504.2	453332.9
R7	Residential - M6	349134.5	453977.1
R8	Residential - M6	348897.4	454070.8
R9	Residential - M6	348759.3	455190.5
R10	Residential Mooring - Lancaster Canal	348277.1	454917.9
R11	Residential Mooring - Lancaster Canal	348269.9	455003.0
R12	Residential - A6, Preston Lancaster Road	348289.1	455186.3
R13	Residential - A6, Preston Lancaster Road	348354.4	455258.4
R14	Residential - A6, Preston Lancaster Road	348364.5	455312.8
R15	Residential - A6, Preston Lancaster Road	348359.8	455360.0
R16	Residential - A6, Preston Lancaster Road	348372.3	455367.4
R17	Residential - A6, Preston Lancaster Road	348385.0	455476.7
R18	Residential - A6, Preston Lancaster Road	348369.1	455571.1

9.6.11 Reference should be made to **Figure 9.3** for a graphical representation of operational phase road vehicle exhaust emission sensitive receptor locations.

9.7. Identification and Evaluation of Likely Significant Effects

9.7.1 This Section describes the potential impacts and likely effects on the baseline described above that could arise in the absence of mitigation during the construction and operation of the proposed development. This will set the scene for the mitigation developed for the Site in the following Section.

Construction Phase

9.7.2 The undertaking of activities such as excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicles movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.

9.7.3 The potential impacts at sensitive locations depends significantly on local meteorology during that undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.

9.7.4 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 350m of the site boundary. As such, a detailed assessment of potential dust impacts has been undertaken.

9.7.5 It should be noted that predicted environmental impacts from construction phase activities are considered to be adverse but temporary in nature.

Earthworks

9.7.6 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The site covers an area greater than 100,000m2. In accordance with the criteria outlined in **Table 9.7**, the magnitude of potential dust emissions from earthworks is therefore large.

9.7.7 **Table 9.18** indicates the sensitivity of the area to dust soiling effects on people or property is high. In accordance with the criteria outlined in Table 9.10, the significance of unmitigated dust soiling effects as a result of earthworks is predicted to be high.

9.7.8 **Table 9.18** indicates the sensitivity of the area to human health is low. In accordance with the criteria outlined in **Table 9.10**, the significance of unmitigated effects at human health receptors as a result of earthworks is predicted to be low.

9.7.9 **Table 9.18** indicates the sensitivity of the area to ecological impacts is low. In accordance with the criteria outlined in **Table 9.10**, the significance of unmitigated effects at ecological receptors as a result of earthworks is predicted to be low.

Construction

9.7.10 Based on initial site layout designs, the new buildings are anticipated to have a total volume of more than 100,000m3. In accordance with the criteria outlined in Table 9.7, the magnitude of potential dust emissions from construction is therefore large.

9.7.11 **Table 9.18** indicates the sensitivity of the area to dust soiling effects on people of property is high. In accordance with the criteria outlined in Table 9.10, the significance of unmitigated dust soiling effects as a results of construction activities is predicted to be high.

9.7.12 **Table 9.18** indicates the sensitivity of the area to human health is low. In accordance with the criteria outlined in **Table 9.10**, the significance of unmitigated effects at human health receptors as a result of construction activities is predicted to be low.

9.7.13 **Table 9.18** indicates the sensitivity of the area to ecological impacts is low. In accordance with the criteria outlined in **Table 9.10**, the significance of unmitigated effects at ecological receptors as a result of earthworks is predicted to be low.

Trackout

9.7.14 Based on the site area, it is anticipated that the unpaved road length may be greater than 100m. In accordance with the criteria outlined in **Table 9.7**, the magnitude of potential dust emissions from trackout is therefore large.

9.7.15 **Table 9.18** indicates the sensitivity of the area to dust soiling effects on people or property is high. In accordance with the criteria outlined in **Table 9.11**, the significance of unmitigated dust soiling effects as a result of trackout activities is predicted to be high.

9.7.16 **Table 9.18** indicates the sensitivity of the area to human health is low. In accordance with the criteria outlined in **Table 9.11**, the significance of unmitigated human health receptors as a result of trackout activities is predicted to be low.

Summary of Dust Effects

9.7.17 A summary of the potential construction phase effect significance from each dust generating activity is provided in **Table 9.20.**

Table 9.20: Summary of Potential Unmitigated Effect Significance

Potential Impact	Potential Unmitigated Dust Effect		
	Earthworks	**Construction**	**Trackout**
Dust Soiling	High	High	High
Human Health	Low	Low	Low
Ecological	Low	Low	-

Operational Phase

9.7.18 Vehicle movements associated with the operation of the proposed development will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutants concentrations at sensitive locations in the vicinity of the site.

9.7.19 For the purpose of the assessment, traffic data for 2023 was utilised as the opening year of the proposed development. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors and background concentrations for 2018 were utilised within the dispersion model. The use of 2023 traffic data and 2018 emission factors is considered to provide a worst-case scenario and therefore predicted pollution concentrations are likely to overestimate actual levels during the operational of the proposed development. Reference should be made to **Appendix 9.1** for assessment inputs.

9.7.20 It should be noted that predicted impacts from operational phase activities are considered to be adverse and permanent in nature.

Predicted Concentrations

9.7.21 Annual mean NO2 concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. The results are summarised in **Table 9.21.**

Table: Predicted Annual Mean NO2 Concentrations

Receptor		Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$)		
		DM	**DS**	**Change**
R1	Residential - A6, Preston Lancaster Road	18.05	18.14	0.09
R2	Residential - A6, Preston Lancaster Road	18.27	18.36	0.09
R3	Residential - A6, Preston Lancaster Road	16.06	16.12	0.06
R4	Residential - A6, Preston Lancaster Road	18.55	18.66	0.11

Receptor		Predicted Annual Mean NO_2 Concentration (µg/m^3)		
		DM	DS	Change
R5	Residential - Whams Lane	21.05	21.19	0.14
R6	Residential - Whams Lane	26.37	26.59	0.22
R7	Residential - M6	19.78	19.90	0.12
R8	Residential - M6	20.72	20.87	0.15
R9	Residential - M6	18.36	18.40	0.04
R10	Residential Mooring - Lancaster Canal	20.15	20.23	0.08
R11	Residential Mooring - Lancaster Canal	20.51	20.59	0.08
R12	Residential - A6, Preston Lancaster Road	17.23	17.28	0.05
R13	Residential - A6, Preston Lancaster Road	30.76	30.94	0.18
R14	Residential - A6, Preston Lancaster Road	31.72	31.91	0.19
R15	Residential - A6, Preston Lancaster Road	35.99	36.21	0.22
R16	Residential - A6, Preston Lancaster Road	37.07	37.30	0.23
R17	Residential - A6, Preston Lancaster Road	26.46	26.60	0.14
R18	Residential - A6, Preston Lancaster Road	28.09	28.24	0.15

9.7.22 As shown in **Table 9.21**, predicted annual mean NO2 concentrations were significantly below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.

9.7.23 Reference should be made to **Figure 9.4** and **Figure 9.5** for graphical representations of annual mean NO2 concentrations across the assessment area for the DM and DS scenarios, respectively.

9.7.24 Annual mean PM10 concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. The results are summarised in **Table 9.22**.

Table 9.22: Predicted Annual mean PM10 Concentrations

Receptor		Predicted Annual Mean PM_{10} Concentration (µg/m^3)		
		DM	DS	Change
R1	Residential - A6, Preston Lancaster Road	11.38	11.40	0.02
R2	Residential - A6, Preston Lancaster Road	11.41	11.43	0.02
R3	Residential - A6, Preston Lancaster Road	10.94	10.95	0.01
R4	Residential - A6, Preston Lancaster Road	11.41	11.43	0.02

Receptor		Predicted Annual Mean PM_{10} Concentration ($\mu g/m^3$)		
		DM	DS	Change
R5	Residential - Whams Lane	11.22	11.24	0.01
R6	Residential - Whams Lane	11.77	11.79	0.02
R7	Residential - M6	11.10	11.11	0.01
R8	Residential - M6	11.21	11.22	0.01
R9	Residential - M6	10.97	10.98	0.00
R10	Residential Mooring - Lancaster Canal	11.75	11.77	0.02
R11	Residential Mooring - Lancaster Canal	11.70	11.71	0.01
R12	Residential - A6, Preston Lancaster Road	11.10	11.10	0.01
R13	Residential - A6, Preston Lancaster Road	13.27	13.30	0.03
R14	Residential - A6, Preston Lancaster Road	13.41	13.45	0.04
R15	Residential - A6, Preston Lancaster Road	13.95	13.99	0.04
R16	Residential - A6, Preston Lancaster Road	14.13	14.17	0.04
R17	Residential - A6, Preston Lancaster Road	12.51	12.53	0.02
R18	Residential - A6, Preston Lancaster Road	12.79	12.82	0.03

9.7.25 As shown in **Table 9.22**, predicted annual mean PM10 concentrations were significantly below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.

9.7.26 Reference should be made to **Figures 9.6** and **Figure 9.7** for graphical representations of annual mean PM10 concentrations across the assessment area for the DM and DS scenarios, respectively.

Effect Significance

9.7.27 Predicted effects on annual mean NO2 concentrations at the sensitive receptor locations are summarised in **Table 9.23**.

9.7.28 **Table 9.23**: Predicted Operational Phase Road Vehicle Exhaust Emissions Effect Significance - NO2

Table 9.23: Predicted Operational Phase road Vehicle Exhaust Emissions Effect Significance - NO2

Receptor		Predicted Concentration	Predicted Concentration Change as Proportion of AQO (%)	Effect Significance
R1	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R2	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible

Receptor		Predicted Concentration	Predicted Concentration Change as Proportion of AQO (%)	Effect Significance
R3	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R4	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R5	Residential - Whams Lane	Below 75% of AQO	0	Negligible
R6	Residential - Whams Lane	Below 75% of AQO	1	Negligible
R7	Residential - M6	Below 75% of AQO	0	Negligible
R8	Residential - M6	Below 75% of AQO	0	Negligible
R9	Residential - M6	Below 75% of AQO	0	Negligible
R10	Residential Mooring - Lancaster Canal	Below 75% of AQO	0	Negligible
R11	Residential Mooring - Lancaster Canal	Below 75% of AQO	0	Negligible
R12	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R13	Residential - A6, Preston Lancaster Road	76 - 94% of AQO	0	Negligible
R14	Residential - A6, Preston Lancaster Road	76 - 94% of AQO	0	Negligible
R15	Residential - A6, Preston Lancaster Road	76 - 94% of AQO	1	Negligible
R16	Residential - A6, Preston Lancaster Road	76 - 94% of AQO	1	Negligible
R17	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R18	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible

9.7.29 As indicated in **Table 9.23**, effects on annual mean NO2 concentrations as a result of the proposed development were predicted to be negligible at all receptors.

9.7.30 Predicted effects an annual mean PM10 concentrations at the sensitive receptor locations are summarised in **Table 9.24.**

Table9.24: Predicted Operational Phase Road Vehicle Exhaust Emissions Effect Significance - PM10

Receptor		Predicted Concentration	Predicted Concentration Change as Proportion of AQO (%)	Effect Significance
R1	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R2	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R3	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible

Receptor		Predicted Concentration	Predicted Concentration Change as Proportion of AQO (%)	Effect Significance
R4	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R5	Residential - Whams Lane	Below 75% of AQO	0	Negligible
R6	Residential - Whams Lane	Below 75% of AQO	0	Negligible
R7	Residential - M6	Below 75% of AQO	0	Negligible
R8	Residential - M6	Below 75% of AQO	0	Negligible
R9	Residential - M6	Below 75% of AQO	0	Negligible
R10	Residential Mooring - Lancaster Canal	Below 75% of AQO	0	Negligible
R11	Residential Mooring - Lancaster Canal	Below 75% of AQO	0	Negligible
R12	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R13	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R14	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R15	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R16	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R17	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible
R18	Residential - A6, Preston Lancaster Road	Below 75% of AQO	0	Negligible

9.7.31 As indicated in **Table 9.24**, effects on annual mean PM10 concentrations as a result of the proposed development were predicted to be negligible at all receptors.

Overall Effect Significance

9.7.32 The overall significance of operational phase road traffic emission effects was determined as negligible, which is considered to be not significant. This was based on the predicted effects at sensitive receptor locations and the considerations outlined previously. Further justification is provided in **Table 9.25.**

Guidance	Comment
The existing and future air quality in the absence of the development	Predicted annual mean NO_2 and PM_{10} concentrations were below the AQOs at all sensitive receptors in the DM scenario. It is considered unlikely that future air quality conditions will change significantly in the absence of the development given the relatively established nature of the area
The extent of current and future population exposure to the impacts	The development is not predicted to affect the population exposed to exceedences of the AQOs

Guidance	Comment
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	The assessment assumed that vehicle exhaust emission rates and background pollutant levels will not reduce in future years. This provides worst-case results when compared with DEFRA and Highways England methodologies Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature

9.8. Mitigation Measures

Construction Phase

9.8.1 Due to the size and nature of the Proposed Development a Construction Environmental Management Plan (CEMP) will be produced to control potential impacts during the construction phase should outline planning permission be granted. The mitigation measures outlined in **Table 9.26** will be included within the CEMP to mitigate fugitive dust emissions during construction. These are based on the advice provided within IAQM guidance and are therefore considered suitable for the site.

Table 9.26: Fugitive Construction Dust Emissions Mitigation Measures

Issue	Control Measure
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager Display the head or regional office contact information Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the LA
Site management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken Make the complaints log available to the LA upon request Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book
Monitoring	Undertake daily on-site and off-site inspection to monitor dust, record inspection results, and make the log available to the LA upon request Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the LA upon request Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
Site preparation	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible Fully enclose site or specific operations where there is a high potential for dust production and they are active for an extensive period Avoid site runoff of water or mud Keep site fencing, barriers and scaffolding clean using wet methods Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary - no idling vehicles Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials

Issue	Control Measure
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate Use enclosed chutes and conveyors and covered skips Minimise drop heights and use fine water sprays wherever appropriate Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods
Waste management	No bonfires or burning of waste materials
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil as soon as practicable
Construction	Avoid scabbling (roughening of concrete surfaces) if possible Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust
Trackout	Use water-assisted dust sweeper on access and local roads, if required Avoid dry sweeping of large areas Ensure vehicles entering and leaving site are covered to prevent escape of materials Record all inspections of haul routes and any subsequent action in a site log book Inspect haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably possible Implement a wheel washing system, if required Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits Access gates to be located at least 10m from receptors where possible

9.8.2 Following the implementation of the measures outlined in **Table 9.26**, the residual impacts from all dust generating activities is predicted to be negligible. This is considered to be not significant, in accordance with the EIA Regulations.

Operational Phase

9.8.3 During the operational phase of the proposed development there is the potential for air quality impacts as a result of vehicle exhaust emissions. These were assessed in accordance with the IAQM methodology . Impacts on pollutant concentrations were predicted to be negligible at all sensitive receptor locations. This is considered to be not significant, in accordance with the EIA Regulations . As such, mitigation measures are not considered necessary.

9.9. Identification of Further Mitigation Measures

Construction Phase

9.9.1 As potential air quality impacts during the construction phase were predicted to be negligible following the implementation of the outlined design measures, further measures to reduce effects are not considered necessary.

Operational Phase

Lancaster Low Emissions and Air Quality Planning Advisory Note

9.9.2 Potential air quality impacts as a result of operational phase vehicle exhaust emissions were predicted to be negligible. However, the LCC 'Low Emissions and Air Quality' PAN provides recommended air quality mitigation which is determined by the scale of the proposals.

9.9.3 The guidance provides a methodology for classifying a development, identifying suitable assessment and mitigation in relation to the classification, and the documents relating to air quality which should be included in the planning application for consideration by the LA.

Site Classification

9.9.4 The general characteristics of the site allows for its classification as one of six possible typologies. In order to establish the classification, the following features must be considered:

- The proposed site land-use;
- The size of the site based on the number of units or floor area;
- The site location in relation to LCC's AQMAs;
- The number of vehicle movements and fleet composition in Annual Average Daily Traffic (AADT) format; and,
- The potential risk of exposure of future site users to poor air quality.

9.9.5 The relevant characteristics were reviewed and a discussion of the findings is provided in **Table 9.27.**

Table 9.27: Development Classification

Consideration	Comment
Land use	The proposed development is classified as mixed-use and comprises holiday lodges, a hotel, activity centres and complementary leisure and retail spaces
Development size	The development comprises over 2,500m^2 of mixed-use land and a 90-bedroom hotel
Site location	The site is located approximately 760m south-west of the Galgate AQMA and is partially within the hatched area defined within the PAN
Development trip generation	Traffic generation associated with the proposals was provided by SK Transport Planning Ltd, the Transport Consultants for the project. This indicated that the proposals are anticipated to generate approximately 2,500 daily movements
Risk of new exposure	The development is not located within an AQMA

9.9.6 Based on the findings summarised in **Table 9.27**, the development would be classified as a Type 3 site, in accordance with the PAN.

9.9.7 It should be noted that although the predicted daily trip generation is anticipated to be more than 1,000, the assessment indicated that impacts on annual mean pollutant concentrations as a result of traffic generated by the development were negligible at all sensitive receptor locations. Given the proposed development is not located within an AQMA, it is considered that standard mitigation measures will be sufficient to reduce any potential air quality impacts to a minimum.

Mitigation

9.9.8 LCC requires the inclusion of the following measures for all sites in order to limit air quality impacts from the developments of any size and location:

- Production and adoption of a CEMP; and,
- Inclusion of electric vehicle (EV) infrastructure.

9.9.9 The Air Quality Assessment includes consideration of potential fugitive dust emissions during construction and highlights suitable mitigation and a full CEMP will be provided as part of the assessment.

9.9.10 As outlined in the Framework Travel Plan for the development, the following mitigation is included as part of the proposals:

- Production and implementation of a Travel Plan;
- A Travel Plan Co-ordinator (TPC) will be appointed two months prior to occupation to co-ordinate the implementation and review of the Travel Plan;
- A Travel Pack will be prepared by the TPC prior to occupation and issued to all operators and staff. Following initial occupation, the travel pack will be regularly updated and re-issued accordingly;
- Information on local walking and cycling routes will be provided to staff in the travel pack and staff and guests on the travel page of the website and at the Tourist Information point;
- Promotion of local and national travel campaigns including changes to public transport services;
- Guests will be required to leave their vehicles on entry at the car park and either walk, cycle or use the electric buggies to access their accommodation, creating a car-free circular route around the site;
- Provision of secure cycle parking and EV charging facilities in line with the appropriate guidance;
- The site will be served by a bike hire scheme that can be used by both staff and guests to travel around the site, and for guests to travel off-site;
- Promotion of the Liftshare car sharing database;
- Provision of a shuttle bus to provide connections to Lancaster City Centre and the train station;
- Two existing canal bridges will be improved to allow connections across all areas of the site and improve access to the canal towpath;

9.9.11 Implementation of the above methods should encourage site access by sustainable transport measures and further minimise air quality impacts throughout the operational phase.

9.9.12 As the current planning application is for outline consent with all matters reserved, except for access, some specific measures could not be finalised at the time of this assessment. As such, the applicant is willing to accept a condition to be attached to any forthcoming permission requiring a Low Emissions Strategy to be produced prior to occupation.

9.10. Residual Impacts

9.10.1 Residual effect of the proposed development following implementation of mitigation measures was predicted to be negligible as a result of construction phase activities. This is considered to be not significant, in accordance with the relevant guidance.

9.10.2 The residual effect of the proposed development following implementation of mitigation measures was predicted to be negligible as a result of operational phase activities. This is considered to be not significant, in accordance with the relevant guidance.

9.11. Conclusions

9.11.1 The proposed development has the potential to cause air quality impacts as a result of fugitive dust emissions during construction and road traffic exhaust emissions associated with vehicles travelling to and from the site during operation. As such, an assessment was undertaken in order to determine baseline conditions and assess potential effects as a result of the proposed development.

9.11.2 During the construction phase of the proposed development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology . Assuming good practice dust control measures are implemented, the residual effect of potential air quality effects from dust generated by earthworks, construction and trackout activities was predicted to be negligible, which is considered to be not significant.

9.11.3 Potential impacts during the operational phase of the proposals may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the site. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the local highway network both with and without the proposed development in place. Results were subsequently verified using local monitoring data.

9.11.4 Review of the dispersion modelling results indicated that effects on annual mean NO2 and PM10 concentrations as a result of traffic generated by the proposed development were classified as negligible at all receptor locations.

9.11.5 Mitigation has been included within the development in accordance with the requirements of the LCC PAN. As the site is not located within an AQMA and predicted impacts as a result of operational phase road vehicle exhaust emissions were predicted to be negligible at all receptor locations, it is considered that standard mitigation measures will be sufficient to reduce any potential air quality impacts to a minimum. As the current planning application is for outline consent with all matters reserved, except for access, some specific measures cannot be finalised at the time of this assessment. As such, it is recommended that a condition is attached to any forthcoming permission requiring a Low Emissions Strategy to be produced prior to occupation.

9.11.6 Based on the worst case predicted impact, the overall significance of potential air quality effects during the operational phase of the proposed development was classified as negligible, which is considered to be not significant.