

10 Air Quality

Introduction

- 10.1 This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of Air Quality.
- 10.2 The following effects air quality have been considered:
- Construction Effects: to evaluate the effects from fugitive dust and exhaust emissions associated with construction activities and the recommendation for any necessary mitigation measures; and
 - Operational Effects: to describe the significance of the potential air quality effects resulting from changes in traffic flow characteristics on the local road network due to the operation of the Proposed Development and operation of any energy centre, with due regard for any impacts on the human-health and ecological receptors, and recommendation for any necessary mitigation.
- 10.3 The main pollutants of concern in this assessment are those associated with vehicle exhaust emissions, the energy centre and nuisance dust from construction works activity and vehicle movements.
- 10.4 The chapter is supported by the following technical appendices in Volume 3 of this ES:
- Appendix 10.1: Construction Dust Assessment Methodology
 - Appendix 10.2: ADMS Model Inputs
- 10.5 Figures 10.1 to 10.14 are included in Volume 2 of the ES.

Assessment Methodology

Legislation and Planning Policy Context

European Legislation

Ambient Air Quality Directive

- 10.6 European Union (EU) air quality legislation is provided within Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidated previous legislation which was designed to deal with specific pollutants in a consistent manner and provided new air quality objectives for particulate matter (PM) with an aerodynamic diameter of less than 2.5µm (PM_{2.5}). The consolidated Directives include:
- Directive 99/30/EC - the First Air Quality "Daughter" Directive - sets ambient Air Quality Limit Values (AQLVs) for nitrogen dioxide (NO₂), oxides of nitrogen (NO_x), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);

- Directive 2000/69/EC - the Second Air Quality "Daughter" Directive - sets ambient AQLVs for benzene and carbon monoxide; and
- Directive 2002/3/EC - the Third Air Quality "Daughter" Directive - seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.

10.7 The fourth Directive was not included within the consolidation and is described as;

- Directive 2004/107/EC - sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

UK Legislation

Air Quality Standards Regulations

- 10.8 The Air Quality Standards (Amendment) Regulations (2016) came into force on 31st December 2016. These Regulations amend the Air Quality Standards Regulations 2010 and transpose the EU Directive 2008/50/EC into UK law. AQLVs were published in these regulations for seven pollutants, as well as Target Values for an additional six pollutants.
- 10.9 AQLVs are legally binding limits on concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects of sensitive groups or on ecosystems.
- 10.10 Part IV of the Environment Act (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 (Air Quality Strategy for England, Scotland, Wales and Northern Ireland). The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for compliance vary slightly.
- 10.11 Table 10.1 presents the AQOs for pollutants considered within this assessment.

Table 10.1: Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration (µg/m ³)	Averaging Period
NO ₂	40	Annual Mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM ₁₀	40	Annual mean
	50	1-hour mean; not to be exceeded more than 35 times a year
PM _{2.5}	25	Annual Mean

- 10.12 Table 10.2 summarises the advice provided in DEFRA guidance, Local Air Quality Management Technical Guidance 2016 (LAQM TG16), (DEFRA, 2016) on where the AQOs for pollutants considered within this report apply.

Table 10.2: Examples of Where the Air Quality Objective apply

Averaging Period	Objectives Should Apply At	Objectives 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 to. 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 and 8 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-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

- 10.13 Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of administration under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves considering present and likely future air quality against the AQOs. If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period 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

- 10.14 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2018) are those provided in Section 79 of Part III of the Environmental Protection Act (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."*
- 10.15 Enforcement of the Act, in regard to nuisance, is currently under the administration 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 (1990). Enforcement can insist that there be no dust beyond the boundary of the works. 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 practice measures.

National Planning Policy

National Planning Policy Framework (NPPF) (March 2018)

- 10.16 The NPPF (Ministry of Housing, Communities and Local Government, 2018) sets out the Government's core policies and principles with respect to land use planning, including air quality. The document includes the following considerations which are relevant to this assessment:

"The planning system should contribute to and enhance the natural and local environment by:

[...]

Preventing both new and existing development from contributing to or 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..." (Paragraph 170 (e)).

"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." (Paragraph 181).

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

National Planning Practice Guidance

- 10.18 The National Planning Practice Guidance (NPPG) (Ministry of Housing, Communities and Local Governments, 2018) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

Paragraph 001 states that: *"Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with EU Limit Values. It is important that the potential impact of new development on air quality is taken into account, where the national assessment indicates that relevant limits have been exceeded or are near the limit".* The role of Local Authorities under LAQM are stated and that AQAPs should be prepared to identify *"measures that will be introduced in pursuit of the objectives..."*

Paragraph 005 states that *"Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to*

generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation..."

Paragraph 007 states that *"Assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality..."*.

In terms of mitigation, Paragraph 008 states that *"Mitigation options where necessary will be location specific, will depend on the proposed development and should be proportionate to the likely impact."*

Paragraph 009 includes a flow chart highlighting how the assessment of air quality impacts should fit into the development management process. It makes it clear that air quality impact risks, AQLVs and AQOs should be considered in the decision-making process.

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

Local Planning Policy

Reading Borough Local Plan

- 10.20 Reading Borough Council's (RBC) Local Development Framework (LDF) (consists of a portfolio of documents of which the Core Strategy, which was adopted with alterations in January 2015, is the principal overarching part. The Core Strategy sets out the strategic policy framework for the city until 2020.
- 10.21 A review of the Core Strategy indicated the following policy in relation to air quality that is relevant to this assessment:

"Policy CS34: Pollution and Water Resources

Development will only be permitted where it would not be damaging to the environment through air, land, noise or light pollution; where it would preserve or ideally enhance ground and surface water quality; and where existing water resources, sewerage and wastewater treatment infrastructure are adequate to support the proposed development.

Proposals for development that are sensitive to the effects of air, noise or light pollution will only be permitted in areas where they will not be subject to high levels of such pollution, unless adequate mitigation measures are provided to minimise the impact of such pollution.

[...]."

"Policy CS11: Use of Employment Land for Alternative Uses

[...]

Factors which may be taken into account in assessing these criteria include:

[...]

(iv) effects on neighbouring uses of noise, pollution and air quality, intensity of activity; ..."

- 10.22 The draft Local Plan was submitted in March 2018 and aims to guide development within Reading up to 2036. A review of this Local Plan indicated the following policy in relation to air quality.

“Policy CC9: Securing infrastructure

Proposals for development will not be permitted unless infrastructure, services, resources, amenities or other assets lost or impacted upon as a result of the development or made necessary by the development will be provided through direct provision or financial contributions at the appropriate time. Employment development should provide mitigation measures in line with its impacts on the demand for housing (including affordable housing), labour and skills and on the transport network.

[...]

Other measures, as follows, should also be considered where a specific need is identified and justified:

[...]

- *Measures to tackle poor air quality or for on-going air quality monitoring; ...”*

“Policy EN15: Air Quality

Development should have regard to the need to improve air quality and reduce the effects of poor air quality.

i. Development that would detrimentally affect air quality will not be permitted unless the effect is to be mitigated. The following criteria should be taken into account:

ii. Where a development would introduce sensitive uses (such as residential, schools and nurseries, hospitals, care facilities) into, or intensify such uses within, an Air Quality Management Area, detrimental effects on that use will be mitigated. Mitigation measures should be detailed in any planning application. If there are significant detrimental effects that cannot be mitigated, the application should be refused.

iii. Where required, planning obligations will be used to secure contributions to measures to tackle poor air quality or for air quality monitoring.”

“Policy CR6 Living in Central Reading

Proposals for residential development within the central area will be assessed against the following criteria:

[...]

ii) Proposals for new residential development within the central area will be required to demonstrate how the issue of potential noise disturbance from neighbouring land uses and other sources, and air quality implications of residential development, have been considered and if necessary, mitigated. New residential development should not be located next to existing town centre uses where those uses would give rise to unacceptable levels of noise and disturbance to the occupiers of the new scheme, unless this can be mitigated.”

“Policy CR14: Other Sites For Development in Central Reading

The following sites will be developed according with the principles set out in this policy:

[...]

- *Address air quality impacts on residential use; ...”*

10.23 Reference has been made to these policies during the undertaking of this Air Quality Assessment by assessing pollutant concentrations across the Proposed Development.

Relevant Guidance

10.24 A series of guidance documents will be considered throughout the project, including,

- National Planning Practise Guidance (NPPG);
- Local Air Quality Management Technical Guidance LAQM 2016 (LAQM (TG16));
- Guidance on the Assessment of Dust from Demolition and Construction;
- Land-Use Planning and Development Control: Planning for Air Quality;
- Institute of Air Quality Management (IAQM); and
- Environmental Protection UK (EPUK).

Study Area

10.25 The Proposed Development is located adjacent to Reading station at approximate National Grid Reference (NGR) 471350, 174010. The site location plan is shown in Figure 10.1.

10.26 The Proposed Development is located within the vicinity of Reading AQMA which has been declared for exceedances of the annual mean AQO for nitrogen dioxide (NO₂). As such, there is the potential for future residents to be exposed to an area of poor air quality. Additionally, there are concerns that the development will cause adverse impacts to existing pollution levels at nearby sensitive receptors within the AQMA.

Baseline Methodology

10.27 The Proposed Development has the potential to cause air quality effects during the construction and operational phases in addition to exposing future site users to elevated pollution levels. These issues have been assessed in accordance with the following methodology.

Construction Phase Assessment

10.28 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, 2014'.

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

- Demolition;
- Earthworks;

- Construction; and
 - Trackout.
- 10.30 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 significant increase in exposure to PM₁₀ and PM_{2.5}.
- 10.31 The spatial scope for the construction phase assessment is detailed in the methodology section below. The assessment has considered the entirety of the site rather than specific phases. By considering the site as a whole this ensures that a worst case assessment has been considered when assessing the potential magnitude of dust generation and the proximity of sensitive receptors.
- 10.32 The guidance screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the site boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should proceed to a detailed assessment. Additionally, should ecological receptors be identified within 50m of the boundary site or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should also proceed to a detailed assessment.
- 10.33 A full methodology for the construction phase assessment is detailed within Appendix 10.2 of the ES.

Operational Phase Assessment

- 10.34 The development has the potential to impact on existing air quality as a result of road traffic exhaust emissions, such as NO₂, PM₁₀ and PM_{2.5}, associated with vehicles travelling to and from the site in combination with the combustion of gas within the proposed combines heat and power (CHP) units will result in emissions, as well as exposing future site-users to elevated pollutant levels.
- 10.35 The maximum number of vehicles generated by the operational phase would be at the anticipated Proposed Development completion year (2025). This scenario also considers the cumulative impacts of the concurrent construction related road vehicles and therefore it is considered that reasonable and robust scenarios have been considered.
- 10.36 The Proposed Development includes sensitive land use and is located in the vicinity of an AQMA. As such, the proposals have the potential to introduce new receptors into an area of existing poor air quality, as well as to cause potential effects within the existing sensitive area. Detailed dispersion modelling was therefore undertaken to quantify NO₂ and PM₁₀ concentrations across the site, determine suitability for the proposed use, and to assess and quantify the effects associated with the Proposed Development. The assessment was undertaken using the following scenarios:
- 2017 Verification;
 - Opening year do-minimum (DM) (predicted traffic flows in 2025 should the proposals not proceed including committed developments flows); and

- Opening year do-something (DS) (predicted traffic flows in 2025 should the proposals be completed including committed developments flows, with the addition of traffic generated by the Proposed Development).
- 10.37 As outlined in Chapter 9: Traffic and Transport of this ES, 2025 represents the year with the maximum quantum of development. Under this assessment year, all construction and operational traffic will access the site from Caversham Road and Trooper Potts Way. 2025 represents the fully operational development with traffic associated with the Proposed Development distributed along surrounding road networks. Further details for assessment input data are included in Appendix 10.1 of this ES.
- 10.38 For road emissions receptors potentially sensitive to changes in NO₂ and PM₁₀ concentrations were identified within 200m of the affected highway network in accordance with the guidance provided within the Design Manual for Roads and Bridges (DMRB) (Highways Agency, 2007) on the likely limits of pollutant dispersion from road sources. LAQM (TG16) provides the following examples of where annual mean AQOs should apply:
- 10.39 The assessment steps are detailed below.
- Residential properties;
 - Schools;
 - Hospitals; and
 - Care homes.
- 10.40 The sensitivity impact significance of each receptor will be defined in accordance with the criteria shown in Table 10.4 to 10.6. These are based upon the guidance provided within the EPUK and IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2015).

Consultation

- 10.41 The Environment Health Officer at Reading Borough Council was consulted to request comment on the proposed methodology and obtain the latest air quality monitoring data. Consultations with the following organisations were carried out. These can be seen in Table 10.3.

Table 10.3: Consultation Responses Relevant to this Chapter

Date	Consultee and Issues Raised	How/ Where Addressed
10 th July 2018	Ross Jarvis <i>Detailed the proposed methodology and requested comments and approval; alongside the most recent LAQM Annual Status Report.</i>	Approval received regarding methodology with no additional comments.
17 th August 2018	Adrian Cole, Traffic Data survey <i>Queries regarding the trip development and traffic flows associated with the development.</i>	Baseline Traffic Data received
January 2018	Scoping Report Paragraph 4.8 <i>Consideration of predicted changes in baseline environmental conditions, including changes</i>	No effects regarding climate change in regard to air quality. All future pollution levels have been addressed in Table 10.16.

Date	Consultee and Issues Raised	How/ Where Addressed
	<i>resulting from climate change, will be set out within each ES topic chapter (Chapters 5 to 12), where robust information is available at the time of writing.</i>	
	Scoping Report Paragraph 4.13 <i>An assessment of the amount of carbon generated from operational traffic will be included within Chapter 9 (Air Quality) of the ES.</i>	All future year operational traffic both committed developments and the proposed development site have been taken into account during the air quality assessment.
	Scoping Report Paragraph 4.17 <i>Consideration has been given to the potential health pathways associated with the proposed development.</i>	Sensitivity of an area and specific sensitive receptors have been addressed in section 'Assessment of construction effects' and 'Assessment of operational effects'
	Scoping report Paragraph 5.63 <i>states that the proposed development is not anticipated to include any centralised means of providing heat and/or power, so intends to scope out this aspect of combustion point sources. However, you are advised that adopted planning Policy DM2 (Decentralised Energy) requires decentralised energy which may include such equipment and the ES will need to discuss this, as appropriate."</i>	Energy production at the development site is currently undergoing discussions. It has been proposed that CHP and boiler units may be installed. Further assessment to follow the air quality assessment once all relevant information has been received.
	Scoping report Paragraph 5.63 <i>Additionally, the operation of the proposed development is not likely to generate dust and therefore an assessment of operational dust effects is also proposed to be scoped out of the assessment.</i>	Operational dust has not been assessed within this report.

Assessment Criteria and Assignment of Significance

- 10.42 The approach is consistent with the EPUK / IAQM Land-use Planning & Development Control: Planning for Air Quality document, the IAQM Guidance on the assessment of dust from demolition and construction and, where relevant, Defra's Local Air Quality Management Technical Guidance: LAQM (TG16). Further information regarding assessment inputs and criteria is shown in Appendix 10.1.

Construction Assessment Criteria

- 10.43 A qualitative assessment of the impact risks and significance of construction dust is considered in accordance with IAQM Guidance, 2014.
- 10.44 The effects of dust are linked to particle size and two main categories are usually considered:
- PM₁₀ particles, those up to 10 µm in diameter, remain suspended in the air for long periods and are small enough to be breathed in and so can potentially impact on health; and

- Dust, generally considered to be particles larger than 10 µm which fall out of the air quite quickly and can soil surfaces (e.g. a car, window sill, laundry). Additionally, dust can potentially have adverse effects on vegetation and fauna at sensitive habitat sites.
- 10.45 The IAQM Guidance on the assessment of dust from demolition and construction sets out 350m as the distance from the site boundary and 50m from the site traffic route(s) up to 500 m of the entrance, within which there could potentially be nuisance dust and PM₁₀ effects on human receptors. For sensitive ecological receptors, the corresponding distances are 50 m in both cases. These distances are set to be deliberately conservative.
- 10.46 The IAQM Construction guidance aims to estimate the impacts of both PM₁₀ and dust through a risk-based assessment procedure. The IAQM Construction guidance provides a methodological framework, but notes that professional judgement is required to assess effects: *“This is necessary, because the diverse range of projects that are likely to be subject to dust impact assessment means that it is not possible to be prescriptive as to how to assess the impacts. Also a wide range of factors affect the amount of dust that may arise, and these are not readily quantified.”* (Section 11).
- 10.47 The dust risk categories that have been determined for each of the four activities above have been used to define the appropriate site-specific mitigation measures based on those described in the IAQM Construction guidance. The guidance states that provided the mitigation measures are successfully implemented, the resultant effects of the dust exposure will normally be *“not significant”*.

Receptor Sensitivity Factors

- 10.48 The influencing factors surrounding the sensitivity of an area around the development for construction, earthworks and trackout are determined in Table 10.4.

Table 10.4: Examples of Factors Defining Sensitivity of an Area

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	Users expect of 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.	Locally designated site e.g. Local Nature Reserve

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
	Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, playing fields, farmland, footpaths, short term car park and roads.	

10.49 The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust effects during the construction phase:

- 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 the 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 effect, as a receptor may become more sensitive over time; and
- Any known specific receptor sensitivities which go beyond the classifications given in the document.

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

10.51 The sensitivity of the area to dust soiling effects on people and property is shown in Table 10.5.

Table 10.5: 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

10.52 Table 10.6 outlines the sensitivity of the area to human health effects.

Table 10.6: Sensitivity of the Area to Human Health Effects

Receptor Sensitivity	Annual Mean PM10 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

Receptor Sensitivity	Annual Mean PM10 Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
	28 - 32µg/m3	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m3	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/m3	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/m3	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m3	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m3	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Less than 24µg/m3	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	-	More than 1	Low	Low	Low	Low	Low

Magnitude of Impact

- 10.53 The potential magnitude of dust emissions through the construction phase is outlined in Tables 1 to 8 Appendix 10.1.
- 10.54 Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. 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 **'not significant'**. This has been described as **negligible** within this report to provide continuity between assessment terminologies.
- 10.55 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts. The IAQM guidance suggests the provision of details of the assessor's qualifications and experience. The Statement of Expertise is included at Appendix 1.2 of this ES.

Operational Phase Assessment Criteria

Human Sensitive Receptors

- 10.56 The air quality impacts at each receptor was defined in accordance with the criteria shown in Table 10.7. These are based upon the guidance provided within the EPUK and IAQM guidance. Sensitivity descriptors are included to allow comparisons of various air quality impacts. It should

be noted that changes of 0%, i.e. less than 0.5%, will be described as **negligible** in accordance with the EPUK and IAQM guidance.

Table 10.7: Operational Traffic Exhaust Emissions - Assessment of Impact

Long Term Average Concentration	% Change in Concentration Relative to AQO			
	1	2-5	6-10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

10.57 Following the prediction of impacts at discrete receptor locations utilising the criteria in Table 10.4, the EPUK and IAQM document states that this framework is to be used as a starting point to make a judgement on significance of effect but other influences might need to be accounted for. Whilst impacts might be determined as '**slight**', '**moderate**' or '**substantial**' at individual receptors, overall effect might not necessarily be deemed as significant in some circumstances. The following factors may provide some assistance in determining the overall significance of a development:

- Number of properties affected by significant air quality impacts and a judgement on the overall balance;
- Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective will be relevant;
- The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors;
- Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease; and
- The extent to which an objective is exceeded e.g. an annual mean NO₂ concentration of 41µg/m³ should attract less significance than an annual mean of 51µg/m³.

10.58 These factors were considered and an overall significance determined for the impact of operational phase road traffic emissions. It should be noted that the determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

10.59 To maintain consistency within this ES the impact descriptors of 'slight', 'moderate' and 'substantial' will be referred to as 'minor', 'moderate' and 'major' respectively.

Significance of Effects

10.60 The assessment of potential effects as a result of the Proposed Development has taken into account both the construction phase and the operational phase. The significance level attributed to each effect has been assessed based on the magnitude of change due to the Proposed Development and the sensitivity of the affected receptor/receiving environment to change.

10.61 Criteria specific to air quality assessments are provided by EPUK and the IAQM where appropriate they have been used in this assessment. However, the criteria terminology has been changed to be consistent with the terminology used in this ES, this is discussed further in the following Section.

10.62 The following terms have been used to define the significance of the effects identified:

- Substantial: where the Proposed Development could be expected to have a considerable effect (either beneficial or adverse) on local air quality;
- Moderate: where the Proposed Development could be expected to have a limited effect (either beneficial or adverse) on local air quality;
- Slight: where the Proposed Development could be expected to result in a slight, very short term or highly localised effect (either beneficial or adverse) on local air quality; and
- Negligible: where no discernible effect is expected as a result of the Proposed Development on local air quality.

Limitations of the Assessment

10.63 The assessment is limited by the following assumptions that were based on professional judgement:

- The soil type on site being potentially dusty;
- The unpaved construction road length being greater than 100m;
- The accuracy of estimates of background pollutant concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions between the Site and observation station;
- Overall dispersion model limitations (discussed further in Appendix 10.3); and
- Uncertainties associated with pollutant monitoring data, including analyser locations.

10.64 Robust assumptions have been made where possible to reduce the likelihood of underestimating the impacts of all potential emissions. For example, it has been assumed that background concentrations will not improve and therefore 2017 background concentrations have been utilised for the assessment of the opening year of the Proposed Development. This provides a robust assessment and is likely to overestimate actual pollutant concentrations during the operation of the Proposed Development.

10.65 The results of the assumptions made in the construction phase assessment therefore represent a worst case scenario which inform the recommended dust mitigation measures.

10.66 It is therefore considered that any flexibilities in data and assumptions used in this chapter are unlikely to significantly alter the conclusions of the air quality assessment.

Baseline Environment

- 10.67 Existing air quality conditions in the vicinity of the Proposed Development site were identified in order to provide a baseline for assessment. These are detailed in the following sections.

Local Air Quality Management

- 10.68 As required by the Environment Act (1995), RBC has undertaken Review and Assessment of air quality within their area of administration. This process has indicated that annual mean concentrations of NO₂ are above the AQO within the borough. As such, an AQMA has been declared within RBC's administration across the whole borough.

“Reading AQMA - An area covering Reading Town Centre, areas along the major radial road routes into Reading (including J11 of the M4) and along the railway lines where they pass through built-up areas.”

- 10.69 The Proposed Development site is located within the Reading AQMA. As such, there is potential for the development to expose future users to elevated pollution levels, as well as to cause potential impacts on air quality within these areas. This has been considered within this chapter.
- 10.70 RBC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMAs have been designated.
- 10.71 Reference should be made to Figure 10.2 for the location of the AQMA.

Air Quality Management

- 10.72 A review of the most recent Air Quality Annual Status Report indicated that RBC monitors pollutant concentrations using continuous methods throughout their area of administration. There are four automatic analysers operated by RBC, the closest of which is RD1, Caversham Road, located approximately 500m north-west of the Proposed Development, at the NGR 471153, 174429. Reference should be made to Figure 10.2 for geographical representation of all monitoring locations. Monitoring results for NO₂ are shown in Table 10.8.

Table 10.8: NO₂ Automatic Monitoring Results

Site Name	Type	NGR (m)		Annual Mean NO ₂ Concentration (µg/m ³)		
		X	Y	2015	2016	2017
Caversham Road	Roadside	471153	174429	38	39	36

- 10.73 As indicated in Table 10.13, the annual mean AQO for NO₂ was not exceeded at Caversham Road in recent years.
- 10.74 Caversham Road automatic monitoring station also monitors annual mean PM₁₀ concentration. Recent monitoring results for PM₁₀ are shown in Table 10.9.

Table 10.9: PM₁₀ Monitoring Results

Site ID	Site Name	Type	NGR (m)		Annual Mean PM ₁₀ Concentration (µg/m ³)		
			X	Y	2015	2016	2017
RD1	Caversham Road	Roadside	471153	174429	28	20	22

- 10.75 As indicated in Table 10.9 the annual mean AQO for PM₁₀ was not exceed at the automatic monitoring site in recent years.
- 10.76 RBC also utilises passive diffusion tubes to monitor NO₂ concentrations throughout the borough. There are 12 diffusion tubes located within the vicinity of the Proposed Development (T1 to T12). Monitoring results for NO₂ are shown in Table 10.10. Exceedances of the AQO are highlighted in **bold**.

Table 10.10 Diffusion Tube Monitoring Results

Site ID	Site Name	Type	NGR (m)		Annual Mean NO ₂ Concentration (µg/m ³)		
			X	Y	2015	2016	2017
T1	33 Caversham Road	Roadside	471123	173734	48	43	45
T2	59a Caversham Road	Roadside	471169	173869	42	41	43
T3	197 Caversham Road	Roadside	471161	174379	39	35	36
T4	Caversham Co-location	Roadside	471156	174424	38	37	38
T5	Caversham Co-location	Roadside	471156	174424	37	38	36
T6	Caversham Co-location	Roadside	471156	174424	37	36	37
T7	108 Caversham Road	Roadside	471293	174236	41	41	40
T8	131 Caversham Road	Roadside	471261	174236	40	36	36
T9	14 Church Road	Roadside	471103	174774	35	37	36
T10	Caversham Café	Roadside	471401	174790	42	42	37
T11	31a Vastern Road (lamppost)	Roadside	471420	174129	36	37	38
T12	Queens Road	Roadside	472015	173223	33	33	31

- 10.77 As indicated in Table 10.10, the annual mean AQO for NO₂ was exceeded at five diffusion tube locations in recent years. This is due to their roadside locations within an AQMA.
- 10.78 Reference should be made to Figure 10.2 for geographical representation of automatic analyser and diffusion tube monitoring locations.

Future Baseline Conditions

- 10.79 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The Proposed Development site is located in grid square NGR: 471500, 173500. Data for

this location was downloaded from the DEFRA website for the purpose of this assessment and is summarised in Table 10.11 for the verification year (2017), the predicted development opening year (2025).

Table 10.11: Predicted background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m ³)	
	2017	2025
NO _x	45.32	33.20
NO ₂	28.47	22.08
PM ₁₀	15.64	14.80
PM _{2.5}	9.89	9.19
CO	450.00	450.00

Sensitive receptors

- 10.80 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 / energy generation emission impacts in the following sections of this chapter.

Construction Phase Sensitive Receptors

- 10.81 Receptors sensitive to potential dust impacts during demolition, earthworks and construction were identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 10.12.

Table 10.12: Demolition, Earthworks and Construction Dust Sensitive Receptors

Distance from Site boundary (m)	Approximate Number of Residential Receptors	Approximate Number of Ecological Receptors
Less than 20	0	0
20 - 50	1 - 10	0
50 - 100	1 - 10	-
100 - 350	More than 100	-

- 10.82 Reference should be made to Figure 10.3 for geographical representation of demolition, earthworks and construction dust buffer zones.
- 10.83 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 route. These are summarised in Table 10.13. The exact construction vehicle access routes were not available for the purpose of this assessment as they will depend on sourcing of materials. This is likely to be

decided by the contractor. However, to assume a robust scenario it was assumed construction traffic would access the site from Troopers Potts Way via Vastern Road. Notwithstanding this, any variations in the routes are unlikely to cause any significant changes to the conclusions of this assessment.

Table 10.13: Trackout Dust Sensitive Receptors

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

- 10.84 Reference should be made to Figure 10.4 for geographical representation of trackout dust sensitive receptor locations.
- 10.85 There are no ecological receptors within 50m of the site or trackout boundary. As such, ecological impacts have not been assessed further within this report.
- 10.86 A number of additional factors have been considered when determining the sensitivity of the surrounding area. These can be seen in Table 10.14.

Table 10.14: Additional Area Sensitivity Factors

Guidance	Comment
Whether there is any history of dust generating activities in the area	The proposal is located adjacent to a predominantly residential and agricultural area. As such, historical dust generation may have occurred as a result of wind-blown emissions from farming processes and transport
The likelihood of concurrent dust generating activity on nearby sites	A review of the RBC planning portal indicated that there are several large scale developments within 500m of the vicinity of the Proposed Development. As such there is risk of concurrent dust occurrences. A detailed list of cumulative schemes can be seen in 'Cumulative Developments' in Appendix 4.6 of the ES.
Pre-existing screening between the source and the receptors	Vegetation is sparse in the vicinity of the development. As such, pre-existing screening to receptors is limited
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	The wind direction is predominantly from the south and south-west of the development, as shown in Figure 10.5. As such, properties to the north and north-east would be most affected by dust emissions.

Guidance	Comment
Conclusions drawn from local topography	The topography of the area appears to be predominantly flat. As such, there are no constraints to dust dispersion.
Duration of the potential impact, as a receptor may become more sensitive over time	It is proposed that the construction will be phased and take place over a 6 year period, as such there is potential for receptor to become more sensitive over time.
Any known specific receptor sensitivities which go beyond the classifications given in the document.	No specific receptor sensitivities identified during the baseline.

- 10.87 Based on the criteria shown in Table 10.14, the sensitivity of the receiving environment to potential dust impacts was considered to be high. This is because users would expect to enjoy a reasonable level of amenity, aesthetics or the value of their property could be diminished by soiling and people would be expected to be present for extended periods of time e.g. residential properties.
- 10.88 The overall sensitivity if the surrounding area to specific potential dust impacts, based on the criteria given in the IAQM guidance, is shown in Table 10.15.

Table 10.15: Sensitivity of the Surrounding Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low	High
Human Health	Low	Low	Low	Medium

Operation Phase Sensitive Receptors

Human Receptors

- 10.89 Human receptors sensitive to potential operational phase road and energy emission impacts were identified from a desk-top study and are summarised in Table 10.16. All sensitive receptors were modelled at a height of 1.5m to represent ground floor level. The sensitivity of a human receptor to health impacts is dependent on the AQO considered, i.e. long term or short term, as defined in Table 10.4 above. Receptors were chosen as those sensitive to both long term and short term impacts, i.e. residential properties or schools.

Table 10.16: Road Vehicle Exhaust Emissions Sensitive Receptors

Receptor		Height (m)	NGR (m)	
			X	Y
R1	Above 97 Caversham Road	4.5	471289	174126
R2	17 Vastern Road	1.5	471380	174152
R3	31 Vastern Road	1.5	471424	174130
R4	121 Caversham Road	1.5	471283	174202
R5	106 Caversham road	1.5	471296	174235
R6	153 Caversham Road	1.5	471262	174235
R7	199 Caversham Road	1.5	471161	174377
R8	182 Caverhsam Road	1.5	471191	174387
R9	12 Bridge Street	4.5	471155	174678
R10	Malcolm Place Apartments	1.5	471160	173831
R11	29 Caversham Road	1.5	471122	173728
R12	Caversham Road	1.5	471091	173609
R13	2-19 Sackville Street	1.5	471150	173654
R14	Hunsaker Apartments	1.5	470960	173533
R15	Hunsaker Apartments	1.5	471011	173486
R16	Cheriton Court	1.5	471157	172992
R17	New Bright Street Apartments	1.5	471339	172911
R18	29 Caverhsam Road	1.5	471107	173680
R19	21 Weldale Street	1.5	471116	173705

10.90 The sensitive receptors identified in Table 10.16 represent worst-case locations in that area due to their location near to roadside or their use. However, this is not an exhaustive list and there may be other locations within the vicinity of the site that may experience air quality impacts as a result of the Proposed Development that have not been individually identified above. Reference should be made to Figure 10.6 for a graphical representation of road vehicle exhaust emission sensitive receptor locations.

Mitigation Measures Adopted as Part of the Project

- 10.91 Mitigation measures during construction, including best practice with regard to fugitive dust emissions, are set out in Table 10.18 below.

Assessment of Construction Effects

- 10.92 There is the potential for air quality impacts as a result of the construction and operation of the Proposed Development in addition to the exposure of future site users to elevated pollution levels. These are assessed in the following sections.
- 10.93 The undertaking of activities such as demolition, excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul road and highway surfaces.
- 10.94 The potential for impacts at sensitive locations depends largely on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.
- 10.95 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 was required using IAQM criteria.

Demolition

- 10.96 Demolition may involve the removal of various structures on site associated with the airport among others. It is anticipated that the volume of buildings to be demolished is likely to be greater than 50,000m³. In accordance with the IAQM criteria outlined in Table 10.8 within Appendix 10.1 the magnitude of potential dust emissions from demolition is therefore **large**.
- 10.97 IAQM criteria indicates the sensitivity of the area to dust soiling effects on people and property is **low**. In accordance with the criteria outlined in Table 10.9 within Appendix 10.1, the development is considered to be a **medium** risk site for dust soiling as a result of demolition activities.
- 10.98 IAQM criteria indicates the sensitivity of the area to human health is **low**. In accordance with the criteria outlined in Table 10.9 within Appendix 10.1, the development is considered to be a **medium** risk site for human health as a result of demolition activities.

Earthworks

- 10.99 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. Information on soil type was not available for the purpose of this assessment. As such, the soil type was considered to be potentially dusty in order to provide a worst-case scenario.
- 10.100 The Proposed Development site is estimated to cover a total area greater than 10,000m². In accordance with the IAQM criteria outlined in Table 10.10 within Appendix 10.1, the magnitude of potential dust emissions from earthworks is therefore **large**.

10.101 IAQM criteria indicates the sensitivity of the area to dust soiling effects on people and property is **low**. In accordance with the criteria outlined in Table 10.10 within Appendix 10.1, the development is considered to be a **low** risk site for dust soiling as a result of earthworks activities.

10.102 IAQM criteria indicates the sensitivity of the area to human health is **low**. In accordance with the criteria outlined in table 10.10 within Appendix 10.1, the development is considered to be a **low** risk site for human health as a result of earthwork activities.

Construction

10.103 Due to the size of the development site the total building volume is likely to be greater than 100,000m³. In accordance with the IAQM criteria the magnitude of potential dust emissions from construction is therefore **large**.

10.104 IAQM criteria indicates the sensitivity of the area to dust soiling effects on people and property is **low**. In accordance with the criteria outlined in Table 10.10 within Appendix 10.1, the development is considered to be a **low** risk site for dust soiling as a result of construction activities.

10.105 IAQM criteria indicates the sensitivity of the area to human health is **low**. In accordance with the criteria outline in Table 10.10 within Appendix 10.1, the development is considered to be a **low** risk site for human health as a result of construction activities.

Trackout

10.106 Information on the number of HDV trips to be generated during the construction phase of the development was not available at the time of assessment. Similarly, the surface material and unpaved road length was not known at this stage of the project.

10.107 Based on the site area, it is anticipated that the unpaved road length is greater than 100m. In accordance with the criteria outlined in Table 10.11 within Appendix 10.1, the magnitude of potential dust emissions from trackout is therefore **large**.

10.108 IAQM criteria indicates the sensitivity of the area to dust soiling effects to people and property is **high**. In accordance with the criteria with the criteria outlined in Table 10.11 within Appendix 10.1, the development is considered to be a **high** risk site for dust soiling as a result of trackout activities.

10.109 IAQM criteria indicates the sensitivity of the area to human health is **medium**. In accordance within the criteria the development is considered to be a **medium** risk site for human health as a result of trackout activities.

Table 10.17: Summary of the Risk of Dust Effect

Potential Impact	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Low	Low	High
Human Health	Medium	Low	Low	Medium

10.110 As indicated in Table 10.17, the potential risk dust soiling is **medium** for demolition activities, **low** for earthworks and construction and **high** for trackout activities. The potential risk of human health is **low** for earthworks and construction activities and **medium** for demolition and trackout activities.

10.111 It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario

of works being undertaken at the site boundary closest to each sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction phase.

10.112 The IAQM guidance provides a number of potential mitigation measures to reduce impacts during the construction phase(s). These measures have been adapted for the development site as summarised in Table 10.18. The mitigation measures outlined in Table 10.18 can be reviewed prior to the commencement of construction works incorporated into the existing the strategies as applicable.

Table 10.18: Fugitive Dust Mitigation Measures

Issue	Control Measure
Communications	• Develop and implement a stakeholder communication 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 • 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 dusty and air quality complaints and make the complaints log available to the LA when asked • Record any exceptional incidents that cause dust/or air emissions, and the action taken to resolve the situation • Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised
Monitoring	• Undertake daily on-site and off-site inspection where receptors are nearby to monitor dust • Carry out regular site inspections to monitor compliance with the DMP • Increase frequency of site inspections when activities with a high potential to produce dust are being carried out
Preparing and Maintaining the Site	• Plan site layout so that machinery and dust causing activities are located away from receptors • Fully enclose site or specific operations where there is a high potential for dust production and the site as 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 • Cover, seed or fence stockpiles to prevent wind whipping Use water as dust suppressant where applicable
Operating Vehicle/ Machinery and Sustainable Travel	• Ensure all on-road vehicles comply with the requirements of the London low emission zone and the London NRMM standards, Where applicable • All vehicles to switch off engines - no idling vehicles • Avoid the use of diesel or petrol-powered generators where practicable • Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph in unsurfaced haul roads • Produce a construction logistics plan to manage the sustainable delivery of goods and materials • Implement a travel plan that supports and encourages sustainable travel.

Issue	Control Measure
Operations	• Cutting equipment to use water as dust suppressant or suitable local extract ventilation • Ensure adequate water supply on the site for effective dust/particulate matter suppression/mitigation • Use enclosed chutes and covered skips • Minimise drop heights • Ensure equipment is readily available on site to clean any spillages
Waste Management	• No bonfires
Demolition	• Soft strip inside buildings before demolition • Ensure effective water suppression is used during demolition operations. • Avoid explosive blasting - use appropriate manual alternatives • Bag or remove any debris
Earthworks and Construction	• Avoid scabbling (roughening of concrete surfaces) • Ensure bulk cement and other fine powders are stored in bunded area and are not allowed to dry out unless this is required for a particular process • Ensure bulk cement and other fine powder materials are delivered and stored to prevent escape
Trackout	• Use water-assisted dust sweeper on the access and local roads • Avoid dry sweeping of large areas • Ensure vehicles entering and leaving sites are covered to prevent escape of materials • Inspect on-site routes for integrity, instigate necessary repairs and record in site log book • Install hard surfaced haul routes which are regularly damped down • Implement a wheel washing system at a suitable location near site exit • 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

Accidents and/or Disasters

10.113 There are no accidents or disasters associated with this development.

Assessment of Operational Effects

10.114 Additional vehicle movements associated with the operation of the Proposed Development and combustion of gas from the CHP plant will generate exhaust emissions, such as NO₂ and PM₁₀, on the local road networks and in the vicinity of the site. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site and to assess the exposure of future site users.

10.115 Details of the proposed CHP facility was not available at the time of writing this chapter and therefore the potential impacts from this emission source will require detailed consideration at a later date, once the detailed design stage has been completed. Upon receipt of the relevant energy generating specifications and consultation with RBC, a further air quality assessment will be undertaken to assess development associated emissions.

10.116 The assessment considered the following scenarios:

- 2017 Verification
- 2025 DM; and
- 2025 DS.

10.117 The verification scenario was representative of baseline traffic data for 2017. The "DM" (i.e. without development) scenario was representative of anticipated traffic data for the opening year including committed developments in the area. The "DS" (i.e. with development) scenario was representative of anticipated traffic data for the anticipated opening year including committed development in the area in addition to vehicle trips associated with the proposal.

10.118 For the purpose of this assessment traffic data was supplied for 2025 as the development opening year. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2017 were utilised within the dispersion model. The use of 2025 traffic data and 2017 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

10.119 Reference should be made to Appendix 10.3 for full ADMS assessment input details.

Nitrogen Dioxide – Annual Mean

Predicted Concentrations across the Site

10.120 Annual mean NO₂ concentrations were predicted across the Proposed Development site for the DS scenarios at the following building heights to represent exposure in 2025 across the ground to third floor levels of the Proposed Development:

- Ground Floor (1.5m);
- First Floor Town House (4.5m);
- First Floor Apartments(6.5m);
- Second Floor (9.5m); and
- Third Floor (12.5m)

10.121 Reference should be made to figures 10.7 to 10.11 for a graphical representation of contour plots for the predicted annual mean NO₂ concentrations. It should be noted that ground floor concentrations were also used to represent basement or lower ground levels.

10.122 Predicted annual mean NO₂ concentrations across the development site at proposed sensitive uses (residential units) during the DS scenario are summarised in Table 10.19. Exceedances in AQO concentrations are shown in **bold**.

Table 10.19: Predicted Annual Mean NO₂ Concentrations Range

Elevation (m)	Predicted 2025 Annual Mean NO ₂ Concentration Range (µg/m ³)
Ground Floor (1.5m)	36.10 – 56.30
Town House First Floor (4.5m)	35.77 – 52.83
First Floor (6.5m)	35.38 – 50.04
Second Floor (9.5m)	34.13 – 44.83
Third Floor (12.5m)	32.57 – 38.71

10.123 The predicted concentrations shown in Table 10.19 predicted NO₂ concentrations exceeded the annual mean AQO across the ground to second floors buildings B, D, F and J. Ground to second floor levels of building A and H and ground to first floor of TH01 and TH02.

10.124 Based on the dispersion modelling results the implementation of mitigation measures is required to protect future site users from poor air quality at floor levels below. Further mitigation techniques are detailed in paragraph 10.148.

10.125 Predictions of 1-hour NO₂ concentrations were not produced as part of the dispersion modelling assessment. However, as stated in LLAQM (TG16) if annual mean NO₂ concentrations are below 60µg/m³ then it is unlikely that the 1-hour AQO will be exceeded. As such based on the results it is not predicted that concentration will exceed the 1 hour mean AQO for NO₂ across the development site.

Predicted Concentrations at Sensitive Receptors

10.126 Annual mean NO₂ concentrations were predicted at the receptor locations for both DM and DS scenarios and are summarised in Table 10.20.

Table 10.20: Predicted Annual Mean NO₂ Concentrations at the Sensitive Locations

Sensitive Receptor	Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
	DM	DS	Change
R1	35.94	35.99	0.050
R2	37.71	37.79	0.080
R3	36.49	36.56	0.070
R4	33.88	33.91	0.030
R5	34.88	34.92	0.040
R6	32.65	32.67	0.020
R7	30.88	30.89	0.010
R8	31.60	31.63	0.030
R9	28.41	28.43	0.020

R10	39.77	39.81	0.040
R11	36.09	36.14	0.050
R12	31.89	31.92	0.030
R13	33.48	33.52	0.040
R14	31.39	31.40	0.010
R15	28.35	28.36	0.010
R16	27.93	27.94	0.010
R17	31.47	31.48	0.010
R18	32.52	32.56	0.040
R19	34.49	34.54	0.050

10.127 As indicated in Table 10.20 predicted annual mean NO₂ concentrations did not exceed the annual mean AQO at any receptor locations. Critically, no new exceedances were anticipated as a result of the operation of the Proposed Development, as exceedances of the relevant AQO are apparent in both the DM and DS scenarios. This has been taken into account in the assessment significance.

10.128 Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 10.21.

Table 10.21: Predicted NO₂ Impacts

Sensitive Receptor	% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	0.20	76-94% of the AQO	Negligible
R2	0.18	95-102% of the AQO	Negligible
R3	0.07	76-94% of the AQO	Negligible
R4	0.10	76-94% of the AQO	Negligible
R5	0.05	76-94% of the AQO	Negligible
R6	0.03	76-94% of the AQO	Negligible
R7	0.07	76-94% of the AQO	Negligible
R8	0.05	76-94% of the AQO	Negligible

Sensitive Receptor	% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R9	0.10	75% or Less of the AQO	Negligible
R10	0.12	95-102% of the AQO	Negligible
R11	0.08	76-94% of the AQO	Negligible
R12	0.10	76-94% of the AQO	Negligible
R13	0.02	76-94% of the AQO	Negligible
R14	0.02	76-94% of the AQO	Negligible
R15	0.03	75% or Less of the AQO	Negligible
R16	0.03	75% or Less of the AQO	Negligible
R17	0.10	76-94% of the AQO	Negligible
R18	0.12	76-94% of the AQO	Negligible
R19	0.20	76-94% of the AQO	Negligible

10.129 As indicated in Table 10.21 the impacts on annual mean NO₂ concentrations as a result of the development was predicted to be **negligible** at all 19 sensitive receptor locations considered.

Particulate Matter - PM₁₀

Predicted Concentrations Across the Site

10.130 Annual mean PM₁₀ concentrations were predicted across the development site for the DS scenario, at a height of 1.5m to represent ground floor level, as shown in Figure 10.12 within Appendix 10.1. Predicted annual mean PM₁₀ concentrations across the development site during the DS scenario are summarised in Table 10.22.

Table 10.22: Predicted Annual Mean PM₁₀ Concentrations at the Development Site

Elevation (m)	Predicted 2025 Annual Mean PM ₁₀ Concentration Range (µg/m ³)
Ground (1.5m)	21.43 – 25.32

10.131 The predicted concentrations shown in Table 10.22 indicate there were no predicted exceedances of the annual mean AQO for PM₁₀ across the entirety of the Proposed Development site.

10.132 Similar to NO₂, it is considered that PM₁₀ concentrations are likely to be lower at elevated heights due to increased distance from emission sources, such as road. Therefore, predicted concentrations at elevations above the ground floor level have not been included within this assessment

10.133 Based on the results of the dispersion modelling assessment, the site is considered to be suitable for residential use without the implementation of mitigation techniques to protect future site users from elevated PM₁₀ concentrations.

Predicted concentrations at Sensitive Receptor Locations

10.134 Annual mean PM₁₀ concentrations were predicted at the receptor locations for each scenario and are summarised Table 10.23.

Table 10.23: Predicted Annual Mean PM₁₀ Concentrations at the Sensitive Locations

Sensitive Receptor	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
	DM	DS	Change
R1	17.750	17.765	0.015
R2	18.418	18.444	0.026
R3	18.119	18.143	0.024
R4	17.522	17.532	0.010
R5	18.010	18.021	0.011
R6	17.276	17.285	0.009
R7	17.056	17.063	0.007
R8	17.305	17.312	0.007
R9	16.552	16.557	0.005
R10	18.663	18.683	0.020
R11	18.154	18.193	0.039
R12	17.454	17.502	0.048
R13	17.940	17.994	0.054
R14	16.303	16.311	0.008
R15	16.510	16.526	0.016
R16	15.844	15.846	0.002
R17	16.963	16.967	0.004
R18	17.515	17.570	0.055

Sensitive Receptor	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
	DM	DS	Change
R19	17.962	18.029	0.067

10.135 As indicated in Table 10.23 predicted concentrations were below the relevant AQO at all sensitive receptors for both scenarios considered.

10.136 Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 10.24.

Table 10.24: Predicted PM₁₀ Impacts

Sensitive Receptor	% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	0.038	75% or Less of AQO	Negligible
R2	0.065	75% or Less of AQO	Negligible
R3	0.060	75% or Less of AQO	Negligible
R4	0.025	75% or Less of AQO	Negligible
R5	0.027	75% or Less of AQO	Negligible
R6	0.023	75% or Less of AQO	Negligible
R7	0.017	75% or Less of AQO	Negligible
R8	0.018	75% or Less of AQO	Negligible
R9	0.012	75% or Less of AQO	Negligible
R10	0.050	75% or Less of AQO	Negligible
R11	0.098	75% or Less of AQO	Negligible
R12	0.120	75% or Less of AQO	Negligible
R13	0.135	75% or Less of AQO	Negligible
R14	0.020	75% or Less of AQO	Negligible
R15	0.040	75% or Less of AQO	Negligible
R16	0.005	75% or Less of AQO	Negligible
R17	0.010	75% or Less of AQO	Negligible

Sensitive Receptor	% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R18	0.137	75% or Less of AQO	Negligible
R19	0.168	75% or Less of AQO	Negligible

10.137 As Indicated in Table 10.24 the impacts on annual mean PM₁₀ concentrations as a result of the development was predicted to be negligible at all 19 sensitive receptor locations considered.

Particulate Matter – PM_{2.5}

Predicted Concentrations Across the Site

10.138 Annual mean PM_{2.5} concentrations were predicted across the development site for the DS scenario, at a height of 1.5m to represent ground floor level, as shown in Figure 10.13. Predicted annual mean PM_{2.5} concentrations across the development site during the DS scenario are summarised in Table 10.25.

Table 10.25: Predicted Annual Mean PM_{2.5} Concentrations at the Development Site

Elevation (m)	Predicted 2025 Annual Mean PM _{2.5} Concentration Range (µg/m ³)
Ground (1.5m)	13.91 – 16.91

10.139 The predicted concentrations shown in Table 10.25 indicate there were no exceedances of the annual mean AQO across the Proposed Development site.

10.140 Similar to PM₁₀, it is considered that PM_{2.5} concentrations are likely to be lower at elevated heights due to increased distance from emission sources, such as the local road network. Therefore, predicted concentrations at elevations above the ground floor level have not been included within this assessment.

10.141 Based on the results of the dispersion modelling assessment, the site is considered to be suitable for residential use without the implementation of mitigation techniques to protect future site users from elevated PM_{2.5} concentrations.

Predicted Concentrations at Sensitive Receptors

10.142 Annual mean PM_{2.5} concentrations were predicted at the receptor locations for each scenario and are summarised Table 10.26.

Table 10.26: Predicted Annual Mean PM_{2.5} Concentrations at the Sensitive Locations

Sensitive Receptor	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
	DM	DS	Change
R1	11.273	11.279	0.006
R2	11.560	11.573	0.013
R3	11.425	11.436	0.011
R4	11.103	11.108	0.005

Sensitive Receptor	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
	DM	DS	Change
R5	11.306	11.312	0.006
R6	10.970	10.973	0.003
R7	10.817	10.820	0.003
R8	10.929	10.932	0.003
R9	10.543	10.546	0.003
R10	11.578	11.587	0.009
R11	11.191	11.210	0.019
R12	10.793	10.816	0.023
R13	11.033	11.058	0.025
R14	9.933	9.937	0.004
R15	10.332	10.340	0.008
R16	9.977	9.978	0.001
R17	10.617	10.619	0.002
R18	10.845	10.872	0.027
R19	11.072	11.104	0.032

10.143 As indicated in Table 10.26 predicted concentrations were below the relevant AQO at all sensitive receptors for both scenarios considered.

10.144 Predicted impacts on annual mean PM_{2.5} concentrations at the sensitive receptor locations are summarised in Table 10.27.

Table 10.32: Predicted PM_{2.5} Impacts

Sensitive Receptor	% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	0.024	75% or Less of AQO	Negligible
R2	0.052	75% or Less of AQO	Negligible
R3	0.044	75% or Less of AQO	Negligible
R4	0.020	75% or Less of AQO	Negligible
R5	0.024	75% or Less of AQO	Negligible
R6	0.012	75% or Less of AQO	Negligible
R7	0.012	75% or Less of AQO	Negligible
R8	0.012	75% or Less of AQO	Negligible
R9	0.012	75% or Less of AQO	Negligible
R10	0.036	75% or Less of AQO	Negligible
R11	0.076	75% or Less of AQO	Negligible
R12	0.092	75% or Less of AQO	Negligible
R13	0.100	75% or Less of AQO	Negligible
R14	0.016	75% or Less of AQO	Negligible
R15	0.032	75% or Less of AQO	Negligible
R16	0.004	75% or Less of AQO	Negligible
R17	0.008	75% or Less of AQO	Negligible
R18	0.108	75% or Less of AQO	Negligible
R19	0.128	75% or Less of AQO	Negligible

10.145 As indicated in Table 10.27 the impacts on annual mean PM_{2.5} concentrations as a result of the development was predicted to be negligible at all 19 sensitive receptor locations considered.

Overall Impact Significance

- 10.146 The overall significance of operational phase road traffic emission impacts was determined as **not significant**. This was based on the most significant impacts at discrete receptor locations and the considerations outlined in the operational phase methodology. Further justification is provided in Table 10.28.

Table 10.28: Overall Impact Significance

Guidance	Comment
Number of properties affected by minor, moderate or substantial air quality impacts and a judgement on the overall balance	NO ₂ , PM ₁₀ and PM _{2.5} concentrations were predicted to be negligible at all sensitive receptors considered. The impacts of the development are therefore predicted to be not significant
Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective or limit value will be relevant	There are predicted exceedances at proposed sensitive locations on the first and second floors on the development site. Mitigation measures will be required to ensure that future on-site exposure is not significant.
The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors	The change in concentration relative to the AQO was predicted to range from: 0.05% to 0.18% for NO ₂ ; 0.005% to 0.168 for PM ₁₀ , and 0.008% to 0.128% for PM _{2.5} . As such, resultant impacts on annual mean NO ₂ , PM ₁₀ and PM _{2.5} concentrations were predicted to be negligible at all sensitive receptor locations and the impacts are considered not significant.
Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease	There were exceedances of the annual mean AQO for across the local road networks within the modelling extent. There were no exceedances of the AQOs for NO ₂ , PM ₁₀ or PM _{2.5} at sensitive locations throughout the modelling extents. The impacts of the development are therefore predicted to be not significant.
The extent to which an objective is exceeded e.g. an annual mean NO ₂ concentration of 41µg/m ³ should attract less significance than an annual mean of 51µg/m ³	There were no exceedances of the AQOs at any existing sensitive receptors.

Further Mitigation and Monitoring

- 10.147 There are a number of air quality mitigation options available to ensure negligible air quality impacts occur as a consequence of the Proposed Development. Additionally, mitigation measures may be required to protect future site users from elevated pollutant as a result of fugitive dust emissions and road vehicle exhaust emissions generated by the construction and operational phase of the Proposed Development. Measures relevant to the operational phases of the proposed Site are outlined in the following sections.
- 10.148 Detailed dispersion modelling undertaken at heights equivalent to the proposed elevations of buildings A to J indicated that residential units across ground (1.5m), first floor town house (4.5m),

first (6.5m), second (9.5m), third (12.5m) floor level may be exposed to elevated annual mean concentrations of NO₂.

10.149 It is therefore proposed that the inclusion of mechanical ventilation should be implemented to all habitable areas the following areas

- Throughout the habitable areas throughout ground to second floor levels of Building B, D, E, F;
- Throughout all habitable areas throughout the ground to first floor of Building H;
- Throughout all habitable areas throughout the first to second floor of Building J and;
- Including proposed townhouses to the ground and first floor level.

10.150 The effected residential units have been predicted to be subject to NO₂ concentrations exceeding the relevant annual mean AQO, and as such, the requirement of mitigation measure is necessary to reduce pollutant concentration to acceptable and safe levels. Mechanical ventilation could include a centralised system with an inlet and outlet positioned at highest feasible position on the northern façades. This positioning of the ventilation system should ensure the supply of clean air within all residential dwellings from the ground to second floor levels.

10.151 It should be noted that according to the IAQM and EPUK Guidance highlighted in Table 10.2 the annual mean objective does not apply at the proposed commercial floorspace within the buildings. This is due to the intermittent nature of access to the site, in which Site users are present for intermittent and irregular.

10.152 Additionally, a high specification of air tightness on the windows and doors should be incorporated at all habitable and commercial units on the ground to fifth floors so when these are closed, the units would be ventilated by clean air from the mechanical filtration systems. Additionally, this provides freedom of choice over whether natural ventilation is preferable during certain periods.

10.153 The key to reducing exposure using this method is to ensure occupants are informed over the potential impacts associated with prolonged exposure to elevated pollution levels. As such, it may also be possible to provide residents with a welcome pack containing air quality information which will allow them to follow appropriate advice on protection against high concentrations during certain periods.

10.154 These proposed mitigation options discussed above are considered a suitable solution for a Proposed Development this size and nature.

Accidents/Disasters

10.155 No accidents or disasters relating to air quality are associated with the Proposed Development.

Potential Changes to the Assessment as a Result of Climate Change

10.156 It is considered that that climate change would not impact on the parameters or conclusions of this assessment.

Assessment of Cumulative Effects

10.157 The spatial scope of cumulative schemes has been considered and those consented development located within 500m of the site that meet the aforementioned criteria have been identified. A full list of cumulative schemes can be found in Appendix 4.6.

Construction Phase

10.158 As discussed previously, there is the potential for cumulative effects on construction dust impacts from other major developments in the vicinity of the development site should the phases overlap and from agricultural dust generating activity in the area.

10.159 There are a number of large scale committed developments located within 500m of the Proposed Development, as listed below:

- Kenavon Drive Reading, Reading (Ref: 170509)
- 33 Blagrove Street Reading (Ref:181074)
- Land at Weldale Street, Reading (Ref:170326 and 160353)

10.160 Due to the size and nature of the above planning applications there is a likelihood for cumulative effects as a result of concurrent dust generating activity should the construction phases overlap. However, the implementation of the following mitigation measures suggested in Table 10.18 will ensure that any cumulative effects at the development site will be minimized.

10.161 Given these considerations and the mitigation measures proposed, the assessment of cumulative construction dust impacts is therefore considered to be **not significant**.

Operational Phase – Future Exposure

10.162 The potential CHP emissions associated with the proposed development have not been considered within this assessment and will require detailed assessment when data are available.

10.163 The cumulative traffic impacts from other potential developments in the area have been included in the future year 2025 traffic flow DM scenarios and therefore the cumulative air quality impacts have been considered within this assessment.

10.164 The developments included in the traffic data are:

- 171814 - Cox & Wyman Ltd Cardiff Road Reading RG1 8EX
- 180358 - Bristol & West Arcade Market Place, Reading, RG1 1JL
- 170509 - Kenavon Drive Reading
- 181074 - 33 Blagrove Street Reading
- 170326 and 160353 - (Land at Weldale Street, Reading
- 181689 - Broad Street Mall, Broad Street, Reading

- 181652 - Former Reading Family Centre North Street Reading RG1 7DA
- 181820/ 151427 / 130436 - 56 Station Hill Reading RG1 1NF
- 162166 - Former Cooper Reading Bmw Kings Meadow Road Reading RG1 8BN
- 162087/150019 - Kings Point 120 Kings Road Reading RG1 3DA
- Vastern Court Retail Park

Inter-relationships

Construction Phase

- 10.165 There is the potential for cumulative impacts on existing sensitive receptors close to the development site from visual and noise impacts in addition to those from dust throughout the construction phase, particularly given the likely length of this phase. The visual impact and noise impact assessments are included in chapters 6: Townscape and 10: Noise and Vibration of the ES, respectively.
- 10.166 However, it is considered that due to the low number of sensitive receptors in the vicinity of the site and that the effective implementation of dust control mitigation measures stated previously, it is likely to be sufficient as to effectively control dust impacts and render these other potential cumulative impacts as not significant.

Operational Phase

- 10.167 There is the potential for air pollution and noise generated by additional road traffic to cause cumulative health impacts. However, given the predicted negligible air quality impacts at all sensitive receptors it is considered unlikely that air quality impacts would contribute to cumulative health impacts in these locations.

Summary of Effects

Construction Phase Residual Effects

- 10.168 Assuming the relevant mitigation measures outlined in Table 10.18 are implemented, the residual effect from all dust generating activities is predicted to be negligible and therefore **not significant**, in accordance with the IAQM guidance.

Operational Phase Residual Effects

- 10.169 Subject to mitigation measures and further detailed dispersion modelling the impacts from the CHP emissions in the vicinity of the site will require further assessment to ensure that the residual impacts would not cause unacceptable impacts to future site users.
- 10.170 The implementation of good practice measures for such as travel plans and electric vehicle charging points should ensure the impacts on human and ecological sensitive receptors in combination with other potential future developments is negligible and therefore not significant.

Receptor	Effects	Mitigation	Residual Effects
During Construction			
Dust Soiling, Human Health and Amenity	Not - Significant	Table 10.18: The Proposed Development will incorporate the specific construction phase mitigation measures outlined in the IAQM guidance.	Negligible dust impacts to property and people
During Operation			
Human Health and Amenity	Not - Significant	Best Practice Measures Para 10.148: Proposed Development will be required to incorporate mechanical ventilation system to each affect floor level that has been predicted to be subjected to exceedances of the AQO for NO ₂ . The ventilation systems will include individual NOx filtration units which will effectively remove NOx pollutants, reducing the concentrations to acceptable and safe levels.	Negligible exposure to elevated pollutant concentrations.

Conclusions

- 10.171 The air quality impacts from the construction phase of the Proposed Development are predicted to be **not significant** subject to mitigation measures and therefore are not considered as a constraint to planning permission.
- 10.172 The air quality impacts from the operational phase on future and existing human sensitive receptors are predicted to be **not significant** subject to mitigation measures and therefore are not considered as a constraint to planning permission.

Table 5.6: Summary of Likely Environmental Effects on Air Quality

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
Construction phase							
On site activities	Medium	Dust Soiling within 350m of site boundary	Medium	Large	Minor adverse	Negligible - Not significant	Recommended dust controls measures
Trackout	High	Human health	Medium	Large	Minor adverse	Negligible - Not significant	Recommended dust controls measures
Operational phase							
On site Exposure	High	Across whole development site	Long	Large	Minor to Moderate Adverse	Negligible - Not significant	CHP/ boiler to be assessed Mitigation measures required eg. Mechanical ventilation Good practice measures
Existing Human Receptors	High	Human Health of receptors of wider road network close to site	Long	Large	Negligible to Minor Adverse	Negligible - Not significant	Good Practice measures

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