Aval Consulting Group.

Air Quality Assessment to Support a Habitat Regulation Assessment

172 Manor Road, Chigwell, IG7 5PX.

Vivid Surveyors Ltd.

October 2021

Project Information

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1 Introduction

1.1 Overview

Vivid Surveyors Ltd ('the Client') is seeking consent for an extension at 172 Manor Road, Chigwell, IG7 5PX (hereafter referred to as the 'proposed development'), which is within the Essex County Council (ECC) and the Epping Forest District Council (EFDC).

Aval Consulting Group Limited (ACGL) was instructed by the client to produce an Air Quality Assessment to Support a Habitats Regulation Assesment to accompany the planning application to the EFDC for consent to undertake the proposed work.

The existing building currently has x5 units and the proposal is for an extension to form a further x2 no. additional apartments, with associated parking, cycles, refuse & landscaping with access taken from Mount Pleasant Road.

The potential local air quality effects of the proposed development have been assessed using the latest planning guidance from Environmental Protection UK (EPUK), the Institute of Air Quality Management (IAQM)[1] , the Department for Environment, Food and Rural Affairs (Defra)[2] and the IAQM document "A guide to the assessment of air quality impacts on designated nature conservation sites".

A construction dust risk assessment has been undertaken, to consider the potential risk from dust-generating activities during the construction phase of the development. This has been carried out in accordance with the latest IAQM guidance on construction dust[3].

1.2 Objective

This report provides an assessment of the following key impacts associated with the constructional and operational phase of the proposed development:

- Nuisance, loss of amenity, and health impacts associated with the construction phase of the development on sensitive receptors;
- Changes in traffic-related pollutant concentrations associated with the operational phase of the proposed development;
- Impact of changes in traffic-related pollutants on Epping Forest SAC;
- Residential suitability of the proposed development location in terms of existing air quality;

[1] IAQM (2017): 'Land Use Planning and Development Control: Planning for Air Quality v1.2'
[2] Defra (2016): 'Local Air Quality Management – Technical Guidance (TG16)'
[3] IAQM (2016): 'Guidance on the Assessment of Dust from Demolition and Construction v1.1'.

1.3 Site Location

Figure 1.1 shows the proposed site location. The proposed development is located approximately 600m from an Air Quality Management Area (AQMA) declared as a result of breaching air quality objectives. The closest SSSI is approximately 2.5km north-east of the proposed development site. Epping Forest SAC is approximately 4km to the west of the development site. Further site drawings are presented in Appendix D.

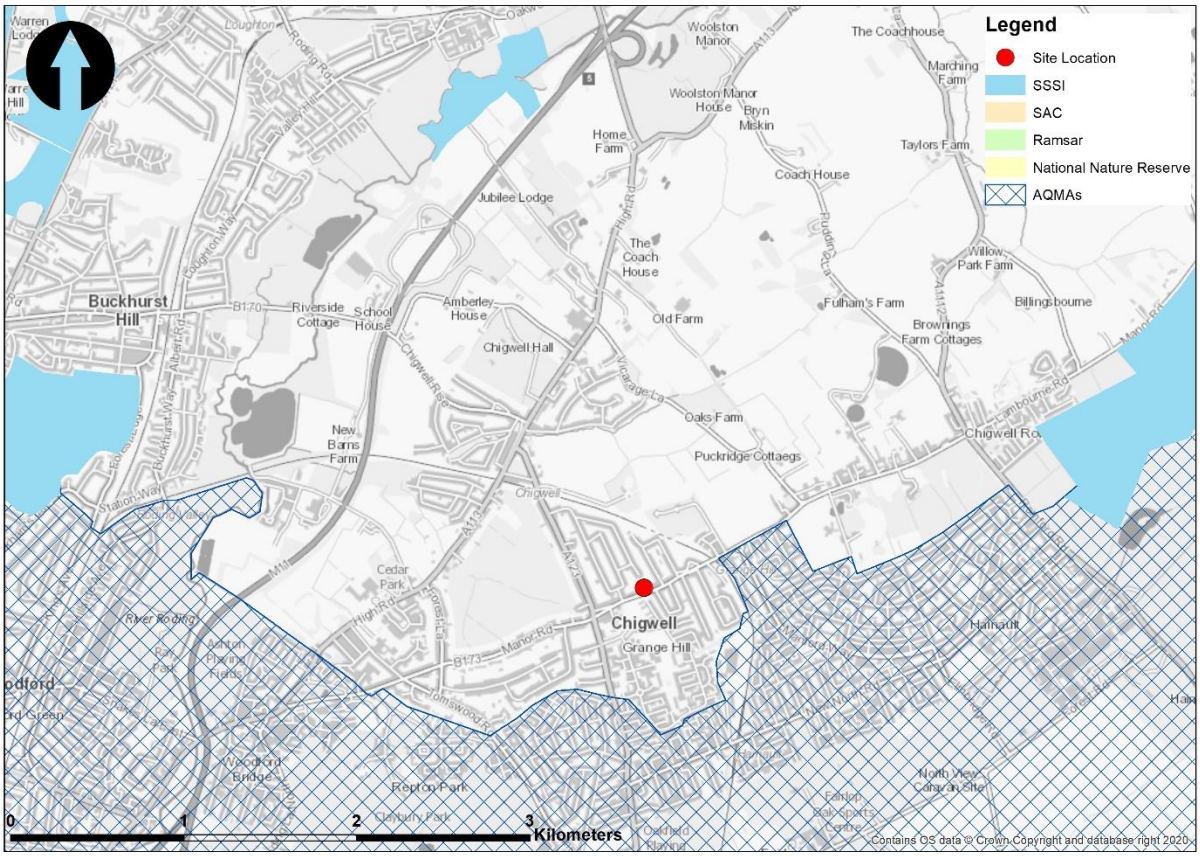

Figure 1.1: Proposed site location

1.4 Key Pollutants

The key pollutants associated with the construction phase of the project will be 'disamenity' or 'nuisance' dust. The key pollutants associated with the operational phase of the proposed development will be road traffic emissions, including nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$). These pollutants are therefore considered as part of this assessment. Further details of the key pollutants are presented in Appendix A.

2. Legislation and Policy

This section summarises all legislation, policy, statutory and non-statutory guidelines relevant to the proposed development. Furthermore, the latest regional and local planning policy guidance specifically applicable to the proposed development has been reviewed.

2.1 European Union

The EU sets legally binding limit values for outdoor air pollutants to be met by EU countries by a given date. These limit values are based on the World Health Organisation (WHO) guidelines on outdoor air pollutants. These are legally binding and set out to protect human health and the environment by avoiding, preventing, or reducing harmful air pollution effects.

The current air quality directive is the Directive 2008/50/EC[4] on ambient air quality and cleaner air for Europe entered into force in June 2008. This merged most of the existing 'Daughter' Directives[5] (apart from the fourth Daughter Directive); maintaining existing air quality objectives set out by 'Daughter' Directives for sulphur dioxide (SO_2), nitrogen dioxide (NO_2), and oxides of Nitrogen (NO_x), particulate matter (PM_{10} and $PM_{2.5}$), lead (Pb), benzene(C_6H_6), carbon monoxide (CO), ozone (O_3). It also includes related objectives, exposure concentration obligation, and exposure reduction targets for $PM_{2.5}$ (fine particles). The 'Daughter' Directives were based upon requirements set out in the first EU Ambient Air Quality Framework Directive 96/92/EEC[6].

2.2 National Level – England

The UK government has a legal responsibility to meet the EU limit values. Part IV of the 1995 Environment Act[7] sets guidelines for protecting air quality in the UK and forms the basis of the local air quality management. The Environment Act requires local authorities in the UK to review air quality in their area periodically and designate 'Air Quality Management Area' (AQMAs) if improvements are necessary. Where an AQMA is designated, local authorities are also required to produce an 'Air Quality Action Plan' (AQAP) detailing the pollution reduction measures that need to be adopted to achieve the relevant air quality objectives within an AQMA.

As part of the Environment Act, the UK Government was required to publish a National Air Quality Strategy (NAQS) to establish the system of 'local air quality management' (LAQM) for the designation of AQMAs. This led to the introduction of the first Air Quality Strategy (AQS) in 1997[8] which since has progressed through several revisions until it was replaced by the Air Quality Strategy for England, Scotland, Wales, and Northern Ireland 2007[9]. Each revision introduced strategies and regulations that considered measures for different pollutants by tightening existing objectives and by introducing new

[4] European Union (2008): 'Ambient air quality assessment management', Framework Directive 2004/50/EC.
[5] European Union. (1999), 'Ambient air quality assessment management', Framework Directive 1999/30/EC;
European Union. (2000), 'Ambient air quality assessment management', Framework Directive 2000/3/EC;
European Union. (2002), 'Ambient air quality assessment management', Framework Directive 2002/3/EC;
European Union. (2004), 'Ambient air quality assessment management', Framework Directive 2004/107/EC.
[6] European Union. (1996), 'Ambient air quality assessment management', Framework Directive96/62/EC.
[7] Parliament of the United Kingdom. (1990), 'Environmental Protection Act', Chapter 43. Queen's Printer of Acts of Parliament.
[8] Department for Environment Food and Rural Affairs. (1997), 'The United Kingdom National Air Quality Strategy', Cm 3587, Department for Environment Food and Rural Affairs.
[9] Department for Environment Food and Rural Affairs. (2007), 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland', Cm 7169, Department for Environment Food and Rural Affairs.

ones to establish a common framework to protect human health and the environment by achieving ambient air quality improvements.

The 2008 EU ambient air quality directive 2008/50/EC was transposed to England law through the introduction of the Air Quality (Standards) Regulations in 2010[10] which also incorporated the fourth EU Daughter Directive (2004/107/EC) that set target values for certain toxic heavy metals and polycyclic aromatic hydrocarbons, (PAH).

2.2.1 National Planning Policy Framework

The principal national planning policy guidance in respect of the proposed development is the National Planning Policy Framework (NPPF)[11]. The most recent update of the NPPF was published on 20th July 2021 by the Department for Communities and Local Government (DCLG).

The NPPF Section 105 states that:

The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.

Section 174 states:

“Planning policies and decisions should contribute to and enhance the natural and local environment by:
…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, taking into account relevant information such as river basin management plans...”

Section 185 states:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:
a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

[10] Statutory Instrument. (2010), ‘The Air Quality Standards Regulations’, No. 1001. Queen's Printer of Acts of Parliament.
[11] National Planning Policy Framework. Accessible at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes, and nature conservation.

Section 186 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."

2.2.2 Relevant National Planning Practice Guidance

The DCLG published a number of supporting web-based resources of Planning Practice Guidance (PPG)[12] to supplement the NPPF. With respect to air quality PPG provide guidance on when air quality is relevant to a planning application. It states that:

"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 (including that applicable to wildlife)."

The PPG also states that, when deciding whether air quality is relevant to a planning application, the applicant should consider whether the proposal will:

"Significantly affect traffic in the immediate vicinity of the proposed development site or further afield. Introduce new point sources of air pollution…..,

Expose people to existing sources of air pollutants…..,

Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations….,

- Affect biodiversity….."

2.2.3 Statutory Nuisance

It is recognised that the planning system presents a way of protecting amenity. However, in cases where planning conditions are not applicable to a development/installation, the requirements of the Environmental Protection Act 1990 still apply. Under Part III of the Environmental Protection Act 1990, local authorities have a statutory duty to investigate any complaints of:

- "any premises in such a state as to be prejudicial to health or a nuisance

[12] National Planning Practice Guidance web-based resource. Accessible at: http://planningguidance.planningportal.gov.uk/

- smoke emitted from premises so as to be prejudicial to health or a nuisance
- fumes or gases emitted from premises so as to be prejudicial to health or a nuisance
- any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance
- any accumulation or deposit which is prejudicial to health or a nuisance"

Where the local authority establishes any one of these issues constitutes a statutory nuisance and believes it to be unreasonably interfering with the use or enjoyment of someone's premises and/or is prejudicial to health, an abatement notice will be served on the person responsible for the offence or the owner/occupier. Failure to comply with the notice could lead to a prosecution. However, it is considered as a defence if the best practicable means to prevent or to counteract the effects of the nuisance are employed.

2.2.4 Relevant National Air Quality Standards

A summary of the relevant Air Quality Standards/Objectives (henceforth referred to as 'AQO') and the types of receptors that are relevant to this assessment are presented in Table 2.1 and Table 2.2. The AQO listed in Table 2.1 applies only at locations with relevant exposure where a member of the public could be exposed to a level of pollution concentration for the specific averaging periods for that pollutant as stated in Table 2.2.

Table 2.1: AQO Relevant to the Proposed Development

Pollutant	**Air Quality Objectives**		**Concentration measured as:**	**Applicable to:**
	Concentration	**Allowance**		
Nitrogen Dioxide (NO_2)	200 µg/m^3	18 per calendar year	1-hour mean	All local authorities
	40 µg/m^3		Annual mean	All local authorities
Particulate Matter (PM_{10})	50 µg/m^3	35 per calendar year	24-hour mean	All local authorities
	40 µg/m^3		Annual mean	All local authorities
Particulate Matter ($PM_{2.5}$) Exposure reduction[(a)]	25 µg/m^3 [(a)]		Annual	England only

Notes: (a) This is a target value set for a 15% reduction in concentrations at urban background aimed to achieve between 2010 and 2020

Source: Department for Environment Food and Rural Affairs (2014): 'Local Air Quality Management Technical Guidance' (TG.16).

Table 2.2: Examples of Where the AQO Should Apply

Averaging period	***Objectives should apply at***	***Objectives should not apply at***
Annual	*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	*All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties.*[(a)]	*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	*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 expected to spend one hour or longer.*	*Kerbside sites where the public would not be expected to have regular access.*

Note: [(a)] "Such locations should represent parts of the garden where relevant public exposure to pollutants is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure to pollutants would occur at the extremities of the garden boundary, or in front gardens, although local judgment should always be applied."

Source: Department for Environment Food and Rural Affairs (2014): 'Local Air Quality Management Technical Guidance' (TG.16).

2.3 Local Level – Epping Forest District Council

The Epping Forest District Council; (LP), published in 2008, states the main policy which contains information about air quality within the area.

Policy RP5A: Adverse Environmental Impacts, states that:
*"*The Council will not grant planning permission for:

(i) development where it could cause excessive noise, vibration, or air, groundwater, or light pollution for neighbouring land uses, protected wildlife species and habitats; or

(ii) sensitive development such as housing (or other forms of residential occupation, including mobile homes and caravans), hospitals or schools which could be subject to either excessive noise from adjoining land uses or traffic (road, rail, and air), or other forms of adverse environmental conditions such as air pollution;

except where it is possible to mitigate the adverse effects by the imposition of appropriate conditions.

Policy NC1-SPAs, SACs, AND SSSIs states that:

"*The Council will refuse planning permission for any development or land use change which could directly or indirectly destroy or adversely affect a Site of Special Scientific Interest. The Council will comply with the U.K.'s international obligations for those SSSIs designated or proposed as Special Protection Areas or Special Areas of Conservation."*

Policy NC2- County Woldlife Sites states that:

"Development or land use change which could directly or indirectly destroy or have an adverse effect upon a County Wildlife Site will be refused unless it can be demonstrated that the reasons for the proposal clearly outweigh the need to safeguard the intrinsic nature conservation value of the site or feature."

Policy NC3- Replacement of Los Habitat tates that:

"*In cases where a County Wildlife Site will be harmed by, or lost to, development, the Council will expect satisfactory arrangements to be made for an alternative habitat of at least equivalent wildlife value."*

Policy NC4- Proection of Established Habitat states that:

"*Development proposals will be expected to make adequate provision for the protection, enhancement and suitable management of established habitats of local significance for wildlife. Such provision may be more stringent when there are known to be protected species either on the site or likely to be affected by the development."*

Policy NC5- Promotion of Nature Conservation Schemes states that:

"*The Council will encourage owners and occupiers of land to participate in schemes which promote the aims of nature conservation by:*

(i) adopting less intensive forms of land management;
(ii) re-introducing traditional management techniques for existing wildlife habitats; and creating new habitats."

2.4 Epping Forest Interim Air Pollution Mitigation Strategy: Managing the Effects of Air Pollution on the Epping Forest Special Area of Conservation

The Epping Forest Interim Air Pollution Mitigation Strategy has been developed to "provide a strategic approach to mitigating the effects of development on the integrity of the Epping Forest SAC in relation to atmospheric pollution.

It has been developed to support the implementation of policies contained within the emerging Local Plan and specifically policies DM2 and DM22. In doing so it reflects the evidence base (the evidence) developed to support the HRA process. This Strategy will therefore support the conclusion of the

Local Plan HRA process and facilitate the determination of individual planning applications which have the potential to have an adverse effect on the integrity of the Epping Forest SAC in relation to atmospheric pollution without mitigation.

It is clear from the evidence that without appropriate mitigation developments proposed through the emerging Local Plan, in combination with other plans and projects, would have an adverse effect on the integrity of the Epping Forest SAC as a result of atmospheric pollution. A key contributor to that atmospheric pollution arises from vehicles."

The Epping Forest Interim Air Pollution Mitigation Strategy describes the pollutants associated with detrimental impacts of the Epping Forest SAC.

Pollutant	**Source**	**Effects on Habitats and Species**
Acid Deposition	SO_2, NO_x and NH_3 all contribute to acid deposition. Although future trends in SO_2 emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is possible that increased ammonia emissions may cancel out any gains produced by reduced SO2 levels.	Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity.
Ammonia (NH_3)	Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in numbers of agricultural livestock. Vehicles fitted with catalytic convertors, such as petrol cars, are also a known source of ammonia. Ammonia reacts with acid pollutants such as the products of SO2 and NOx emissions to produce fine ammonium (NH4+) - containing aerosol which may be transferred much longer distances (can therefore be a significant transboundary issue.)	Adverse effects are as a result of direct toxicity and from nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and NH3 is rapidly deposited, some of the most acute problems of NH3 deposition are for close to the roadside or close to point sources in intensive agricultural landscapes.
NO_x	Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations, one-half from motor vehicles, and the rest from other industrial and domestic combustion processes.	Deposition of nitrogen compounds (nitrates (NO3), nitrogen dioxide (NO2) and nitric acid (HNO3) can lead to both soil and freshwater acidification. In addition, NOx can cause eutrophication of soils and water. This alters the species composition of plant

		communities and can eliminate sensitive species
Nitrogen deposits	The pollutants that contribute to nitrogen deposition derive mainly from NOx and NH3 emissions. These pollutants cause acidification (see also acid deposition) as well as eutrophication.	Species-rich plant communities with relatively high proportions of slowgrowing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species which can respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Sulphur Dioxide	Main sources of SO_2 emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total SO_2 emissions have decreased substantially in the UK since the 1980s – UK emissions in 2018 decreased by 96% relative to 1990, below the 2020 NECD and Gothenburg emission targets.	Wet and dry deposition of SO_2 acidifies soils and freshwater, and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils.

3. Methodology

3.1 Overview

This section provides the details of the methodological approach taken to assess the impacts on air quality from the construction and operation stages of the proposed development.

3.2 Scope of the Assessment

3.2.1 Construction Phase

A construction dust assessment was carried out to consider impacts from 'disamenity' (or 'nuisance') dust, as discussed in Appendix A3, associated with annoyance. The development has the potential to generate dust during the construction phase of the project. Although there are no standards (such as AQO) for dust disamenity or annoyance, various 'custom and practice' criteria have become established.

For the purposes of this assessment, IAQM's 2016 construction dust guidance[13] has been used. The IAQM guidance provides a methodology (Appendix B) to evaluate the potential risk of dust generation for development and the level of mitigation required. The impact of the development is described using one of the following three categories: 'Low Risk', 'Medium Risk' and 'High Risk'. Based on the risk level, appropriate mitigation measures can be considered to minimise any effects of dust from the construction phase.

3.2.2 Operational Phase

As mentioned in Section 2.4, traffic-related pollutants have the potential to have adverse effects on ecological receptors. The scope of this assessment has been agreed upon with Epping Forest District Council via an e-mail conversation.

The proposal is for the construction of 2 additional appartments, to form a total of 7 apartments with associated parking, cycles, refuse & landscaping with access taken from Mount Pleasant Road. In order to estimate the trips likely to be generated as a result of the proposed development, person-based trip rates have been derived from the latest TRICS online database (version 7.6.1) for sites with characteristics similar to the proposed development. This trip generation assessment has been carried out in accordance with good practice guidelines, including the Department for Transport 'Guidance on Transport Assessment (GTA)' and the National Planning Policy Framework. The estimated TRICs report has been presented in Appendix F.

Trip rates were obtained using the 'Flats Privately Owned' land use category. Multi-modal surveys were selected only, and sites in the 'Edge of Town' and 'Sub Urban' and 'Neighbourhood Centre' zones were selected, resulted in a dataset of 7-weekday surveys (Monday – Friday) and 0-weekend surveys.

Based on the above, daily trip rates were obtained and presented below in Table 3.1.

[13] Institute of Air Quality Management (2014): 'Guidance on the Assessment of Dust from Demolition and Construction'

Table 3.1: Vehicle based trip rates

Time period	Trip rate per dwelling		
	Arrivals	Departures	Total
Daily	1.64	1.61	3.25

Table 3.2: Development generated vehicular trips

Time period	Car Trip Generation for Existing Development (5 dwellings)			Car Trip Generation for Proposed Development Plus Existing Development (7 dwellings)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Daily	9	9	18	12	12	24

Based on above, it can be seen from Table 3.2 that the proposed development is predicted to generate 24 daily vehicular trips. Due to the residential nature of the proposed development, it is not anticipated that any HGV traffic will be generated.

Due to the estimated low number of trips generated, a trip distribution assessment within 200m of the SAC is not considered necessary, as it is unlikely that there would be a significant increase in vehicular trips on roads within 200m of the SAC. Therefore, this has been scoped out.

The IAQM Guidance states that *"where annual average daily traffic movements (AADT) resulting from development did not exceed 1000 on affected roads, environmental effects could be regarded as neutral and "scoped" out of any further assessment."* The trip generation is estimated to be well below the 1000AADT threshold and therefore a detailed assessment is not considered required.

The proposed development will not introduce any CHP plant or biomass boilers and is likely to use standard low-NO_x gas boilers. Based on this, a detailed energy plant-related point source stack emission assessment can be scoped out.

The residential suitability (i.e. exposure to existing air pollution for occupants), in terms of existing air quality, has been assessed by comparing local monitoring and background data with the relevant AQO.

4. Baseline Conditions

4.1 Overview

The following section sets out the baseline conditions in relation to air quality for the proposed development. Baseline air quality information is available from a number of sources, including local and national monitoring data reports and websites. For the purposes of this assessment, data has been obtained from the Defra air quality resource website[14] and from the latest Epping Forest District Council Annual Status Report (ASR)[15].

4.2 Existing Baseline Conditions

Epping Forest District Council did not undertake automatic (continuous) monitoring of NO_2 or PM_{10} at any sites during 2019. However, they undertook non-automatic NO_2 monitoring using passive diffusion tubes at 42 sites during 2019.

Figure 4.1 presents the monitoring site location in relation to the proposed development.

The nearest non-automatic monitoring sites are numbers 1, 34, 35, 36 which are all approximately 300m from the site which measured 39µg/m^3, 30µg/m^3, 22µg/m^3, and 36µg/m^3 which are all below the AQO of 40µg/m^3.

Defra background concentrations are presented in Section 4.3.

[14] Department for Environmental Food and Rural Affairs. Accessible at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2015
[15] Epping Forest District Council (2020): 'Epping Forest District Council Air Quality Annual Status Report for 2019'

Figure 4.1: Existing nearby monitoring sites

4.3 Defra Background Pollution Concentrations

Defra provides background pollution concentration estimates to assist local authorities to undertake their 'Review and Assessment' work. This data is available to download from Defra air quality resource website for NO_x, NO_2, PM_{10}, and $PM_{2.5}$ for every 1 km X 1 km grid square for all local authorities. The current dataset is based on 2020 background data and the future year projections are available for 2017 to 2030. The background dataset provides a breakdown of pollution concentrations by different sources (both road and non-road sources).

Table 4.3 presents the predicted background concentrations for the study area for the earliest year of occupation (2021) for the relevant receptor locations. Background concentrations for all pollutants presented in Table 4.1 are well below the relevant AQO.

Table 4.3: Defra Projected Background Concentrations (for all receptors)

Pollutant	Concentration (µg/m^3)
NO_2	16.9
PM_{10}	16.2
$PM_{2.5}$	10.8

Note: Data presented within the table are derived from the following ordinance survey grid squares: 544500, 192500.

4.4 Baseline Summary

Based on the Defra predicted background pollutant concentration, the proposed development site location is considered suitable for residential development. All predicted concentrations were below

AQO and therefore would suggest that ecological receptors at Epping Forest SAC are currently unlikely to be exposed to air of poor quality.

5. Potential Impacts

5.1 Construction Phase

The construction phase of the proposed development is yet to be decided. For the purpose of this assessment, the earliest construction year is assumed to be 2021. The impacts from demolition, earthworks, construction and track-out have been considered. In order to assess the worst-case scenario, it has been assumed that all activities will be carried out for the duration of the construction period. Figure 5.1 shows the construction dust assessment study area based on the recommended distances by IAQM.

Magnitude and sensitivity descriptors that have been applied to assess the overall impact of the construction phase are presented in Appendix C.

Table 5.1 presents the potential dust emission magnitude based on project-specific construction activities and is based on the criteria presented in Table C1 within Appendix C.

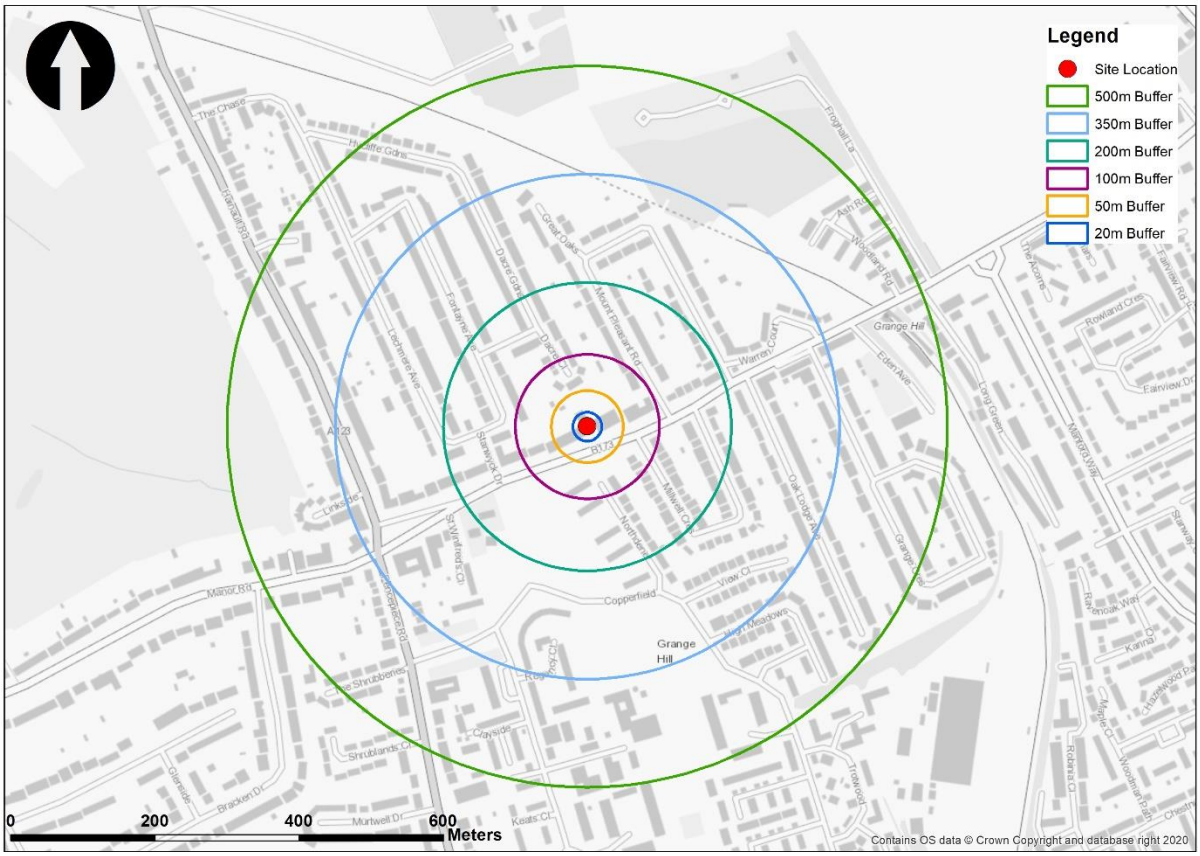

Figure 5.1: Construction assessment buffers

Table 5.1: Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Small
Construction	Small
Track Out	Small

Table 5.2 presents the sensitivity of receptors to effects caused by construction activities and is based on the criteria presented in Table C 2 within Appendix C.

Table 5.2: Sensitivity of Study Area

Potential Impact	The sensitivity of the surrounding area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low

Table 5.3: Summary of the Risk of Construction Effects

Sensitivity of Area	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Low Risk	Low Risk	Low Risk
Human Health	Negligible	Negligible	Negligible	Negligible

Based on the above, the largest risk associated with all construction activities is considered to be 'Medium Risk' with regards to dust soiling and 'Negligible' with regards to human health. Based on the outcome of the construction dust assessment, mitigation measures appropriate for the proposed development have been presented in Section 6. Overall, the impacts from disamenity dust and PM_{10} from the construction phase of the proposed development are considered to be not significant.

5.2 Operational Impacts

There are no significant operational impacts associated with the proposed development, as discussed in Section 3.2.2.

6. Proposed Mitigation Measures

6.1 Construction Phase Mitigation Measures

Mitigation measures have been set out in Appendix D in accordance with mitigation measures set out in the IAQM guidance for construction dust to reduce the potential impacts presented in Section 5.

The risks of construction activities in relation to dust soiling were deemed Medium Risk', and all risks to human health were also deemed 'Negligible'. Therefore, it is recommended that the mitigation measures appropriate to mitigate 'Medium Risk' effects, as proposed in Appendix D are applied during the construction phase.

6.2 Operational Phase Mitigation Measures

As discussed in Section 3.2 there are no impacts associated with the operational phase of the proposed development and therefore no adverse impacts on Epping Forest SAC. No mitigation measures are considered necessary.

7. Conclusion

This report provides an assessment of the following potential key impacts associated with the construction and operational phases of the proposed development at 172 Manor Road, Chigwell, IG7 5PX.

- Nuisance, loss of amenity, and health impacts associated with the construction phase of the development on sensitive receptors;
- Changes in traffic-related pollutant concentrations associated with the operational phase of the proposed development;
- Residential suitability of the proposed development location in terms of existing air quality;
- Assessing the ecological effect on Epping Forest SAC.

A qualitative assessment of construction dust effects has been undertaken for the proposed scheme. The construction phase is predicted to have a 'Medium Risk' of nuisance and/or loss of amenity impacts due to dust nuisance. However, the risk of dust nuisance can be mitigated by implementing the appropriate mitigation measures listed in Appendix D.

The development is not anticipated to generate a significant number of additional road traffic during the operational phase and falls below the criteria proposed by IAQM to proceed to a detailed assessment.

It can, therefore, be concluded that the proposed development is not considered to conflict with any national, regional, or local planning policy in relation to construction and operation phase dust and air quality nuisance.

Appendices

Appendix A: Key Pollutants

A1. Nitrogen Dioxide (NO_2)

Nitrogen dioxide (NO_2) and nitric oxide (NO) are collectively referred as oxides of nitrogen (NO_x). During fuel combustion, atmospheric nitrogen combines with oxygen to form nitric oxide (NO), which is not considered harmful. Through, a chemical reaction with ozone (O_3), however NO can further combine with oxygen to create NO_2 which is harmful to human health and vegetation. The foremost sources of NO_2 in the UK are from combustion sources produced mainly by road traffic and power generation.

A2. Particulate Matter

Particulate matter is a term which refers to a mixture of solid particles and liquid droplets found in the air. These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others can be so small that they can only be detected using an electron microscope. Fine dust, essentially particles up to 10 micron (µm), is commonly referred to as PM_{10}.

PM_{10} is known to arise from a number of sources such as construction sites, road traffic movement, industrial and agricultural activates. Very fine particles ($PM_{2.5}$ – PM $_{0.1}$) are known to be associated with pollutants such as oxides of nitrogen (NO_x) and sulphur dioxide (SO_2) emitted from power plants, industrial installation and road transport sources.

$PM_{2.5}$ is generally associated with combustion and traffic sources and is more likely to be associated with the operational phase of the proposed development.

A3. 'Disamenity' Dust

'Dust' is generally regarded as particulate matter up to 75 µm (micron) diameter and in an environmental context can be considered in two categories, according to size: coarser dust (essentially particles greater than 10 µm) and fine particulate matter (PM_{10} and $PM_{2.5}$) as set out above.

Coarser dust (essentially particles greater than 10 µm) is generally regarded as 'disamenity dust' and can be associated with annoyance, although there are no official standards (such as AQO) for dust annoyance. Disamenity dust is more readily described than defined as it relates to the visual impact of short-lived dust clouds and the long-term soiling of surfaces.

Although it is a widespread environmental phenomenon, dust is also generated through many human activities including industrial and materials handling sites, construction and demolition sites and roads. Dust is generally produced by mechanical action on materials and is carried by moving air when there is sufficient energy in the airstream. More energy is required for dust to become airborne than for it to remain suspended.

Appendix B: Operational Impact Assessment Methodology

The EPUK & IAQM guidance refers to the Town and Country Planning (Development Management Procedure) Order (England) 2010 [(Wales) 2012] for a definition of a 'major' development when scoping assessments required for the planning process. Based on the guidance, a 'major' development is such development where:

- The number of dwellings is 10 or above;
- The residential development is carried out of a site of more than 0.5ha where the number of dwellings is unknown;
- The provision of more than 1,000 m^2 commercial floorspace; or,
- Development carried out on land of 1ha or more.

It is recommended that consideration should be given to reduce impacts from any 'major' developments by considering:

- The impact of existing sources in the local area on the proposed development; and
- The impacts of the proposed development on the local area.

The assessment process involves two stages where:

Stage 1 scope out the need for an air quality assessment and **Stage 2** provide guidance of determining the level of assessment required for a project.

Table B 1 below sets out the Stage 1 criteria to determine the need to assess impacts arising from small developments and Table B 2 provides more specific guidance as to when an air quality assessment is likely to be required to assess the impacts of the proposed development on the local area.

Table B 1: Stage 1 Criteria to proceed to Stage 2

Criteria to Proceed to Stage 2	
A	If any of the following apply: • or more residential units of a site area of more than 0.5ha • More than 1,000m^2 of floor space for all other uses or a site area greater than 1ha
B	Coupled with any of the following: • The development has more than 10 parking spaces • The development will have a centralised energy facility or other centralised combustion process

Table B 2: Indicative Criteria for Requiring an Air Quality Assessment

The development will	Indicative Criteria to Proceed to an Air Quality Assessment
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight).	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
3. Realign roads, i.e. changing the proximity of receptors to	Where the change is 5m or more and the road is within an AQMA.
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. NB. this includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.	Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

Appendix C: Construction Dust Assessment Criteria

IAQM guidance framework on assessing the risk of dust proposes the construction phase should be split into phases dependent on their potential impacts, determining the risk for each individually. Therefore, this assessment has determined the risk of the four construction categories put forward by the IAQM guidance:

- Demolition;
- Earthworks;
- Construction; and
- Track out (transport of dust and dirt onto the public road network).

The IAQM guidance framework states that the risk of dust impacts from the four categories can be defined as 'negligible', 'low risk', 'medium risk' or 'high risk' depending upon the scale and nature of the construction activity and the sensitivity and proximity of receptors to the construction site boundary. This categorisation is used to put forward appropriate mitigation measures, reducing the level of effects from the dust impacts so they are not significant.

The assessment of dust impacts using the IAQM guidance considers three separate effects from dust:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to significant increase in exposure to PM_{10}.

Step 1 of the assessment is set out to screen for the requirement for a more detailed assessment for the proposed development. The screening criteria states:

A 'human receptor' within:

- 350 m of the boundary of the application site; or
- 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

An 'ecological receptor' within:

- 50 m of the boundary of the application site; or
- 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

Where there are no receptors and the level of risk is deemed 'negligible', there is no need for further assessment.

Step 2A of the assessment enables the overall dust emission magnitude (small, medium or large) from each dust source (demolition, earthworks, construction and trackout) to be identified in relation with the criteria outlined in Table C 1.

Table C 1: Dust emission magnitude

Source	Large	Medium	Small
Demolition	Total building volume >50,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level.	Total building volume 20,000 m^3 – 50,000 m^3, potentially dusty construction material, demolition activities <10 – 20 m above ground level.	Total building volume <20,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10 m above ground, demolition during wetter months.
Earthworks	Total site area >10,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes.	Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m – 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes.	Total site area <2,500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <20,000 tonnes, earthworks during wetter months.
Construction	Total building volume >100,000 m^3, on site concrete batching or sandblasting.	Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching.	Total building volume <25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).
Track out	>50 HDV (>3.5t) outward movements[a] in any one day[b], potentially dusty surface material (e.g. high clay content), unpaved road length >100 m.	10-50 HDV (>3.5t) outward movements[a] in any one day[b], moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m.	<10 HDV (>3.5t) outward movements[a] in any one day[b], surface material with low potential for dust release, unpaved road length <50 m.

Notes: [a] Vehicle movement is a one-way journey. i.e. from A to B, and excludes the return journey.

[b] HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.

Step 2B allows for the sensitivity of the area (high, medium or low) to be assessed and takes into account a number of factors:

- The specific sensitivities of receptors in the area;

- The proximity and number of those receptors;
- In the case of PM_{10}, the existing local background concentration; and
- Site specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Receptor sensitivity has been based on the highest of any criteria being met thus, the assessment is considered as robust. The sensitivity of the area is further determined for dust soiling, human health and ecosystem effects by considering the criteria presented in Table C 2.

Table C 2: Magnitude of Receptor Sensitivity

Source	High	Medium	Low
Sensitivities of people to dust soiling effects	• Users can reasonably expect enjoyment of a high level of amenity; or • The appearance, aesthetics or value of their property would be diminished by soiling; and • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • Indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks[b] and car showrooms.	• Users would expect[a] to enjoy a reasonable level of amenity, but would not reasonably expect[a] to enjoy the same level of amenity as in their home; or • The appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property wouldn't reasonably be expected[a] to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Indicative examples include parks and places of work.	• The enjoyment of amenity would not reasonably be expected[a]; or • Property would not reasonably be expected[a] to be diminished in appearance, aesthetics or value by soiling; or • There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. • Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks[b] and roads.
Sensitivities of people to health effects of PM_{10}	• Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).[c]	• Locations where the people exposed are workers[d], and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include office and shop	• Locations where human exposure is transient.[e] • Indicative examples include public footpaths, playing fields, parks and shopping streets.

Source	High	Medium	Low
	• Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	
Sensitivities of receptors to ecological effects	• Locations with an international or national designation and the designated features may be affected by dust soiling; or • Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. • Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.	• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or • Locations with a national designation where the features may be affected by dust deposition. • Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.	• Locations with a local designation where the features may be affected by dust deposition. • Indicative example is a local Nature Reserve with dust sensitive features.

Notes: a People's expectations will vary depending on the existing dust deposition in the area, see Section 4.2.

b Car parks can have a range of sensitivities depending on the duration and frequency that people would be expected to park their cars there, and the level of amenity they could reasonably expect whilst doing so. Car parks associated with work place or residential parking might have a high level of sensitivity compared to car parks used less frequently and for shorter durations, such as those associated with shopping. Cases should be examined on their own merits.

c This follows Defra guidance as set out in LAQM.TG (09).

d Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected to exposure of PM10. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. For this reason workers have been included in the medium sensitivity category.

e There are no standards that apply to short-term exposure, e.g. one or two hours, but there is still a risk of health impacts, albeit less certain.

f Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.

The final step, step 2C allows for the risk of impacts to be defined. The dust emission magnitude derived in step 2A is combined with the sensitivity of the area defined in step 2B to determine the risk of effects on:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to an increase in exposure to PM_{10}.

The criteria for each of the dust sources are presented in Table C 3, Table C 4, Table C 5 and Table C 6.

Table C 3: Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table C 4: Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table C 5: Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table C 6: Track out

Sensitivity of Area	**Dust Emission Magnitude**		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Appendix D: Mitigation Measures for Construction Impacts

Mitigation measures set out are from IAQM guidance for construction dust and are appropriate for the mitigation of 'Medium Risk' effects as proposed below:

- 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 Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real- time PM10 continuous monitoring and/or visual inspections.
- 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 local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.
- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is actives 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 on site. If they are being re-used on-site cover as described below.

- Cover, seed or fence stockpiles to prevent wind whipping.
- Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.
- 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 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
- Avoid bonfires and burning of waste materials.
- 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.
- Only remove the cover in small areas during work and not all at once.
- 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, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Record all inspections of haul routes and any subsequent action in a site log book.

- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

Appendix E: Site Drawings

Please see planning portal for the most recent drawings submitted as part of the planning application

Appendix F: TRICs Output