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11-12 INGESTRE ROAD, LONDON ,NW5 1UX

Air Quality Assessment – Revision D

11-12 INGESTRE ROAD, LONDON, NW5 1UX
Air Quality Assessment

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Registration of Amendments

Revision and Date	Amendment Details	Revision Prepared By	Revision Approved By
A 10/07/2018	Updates to paragraphs 2.13, 3.6, 4.5, 5.4, 6.5 and 6.6 as per comments from BW.	DM	CB
B 16/7/2018	Update tables 6.5, 6.6, 6.7 and 6.8 to reflect further comments from BW.		
C 4/9/2018	Review to reflect final scheme design		
D 5/9/2018	Updates to National Legislation and Local Policy	AG	PZ

1.0 INTRODUCTION

1.1 Create Consulting Engineers Ltd has been commissioned by Four Quarters (Ingestre Road) Ltd to produce an Air Quality Assessment to support the planning application for a proposed Extra Care Development at the site of the former care home at 11-12 Ingestre Road, London, NW5 1UX.

Site Location and Description

1.2 The Site is located at 11-12 Ingestre Road in the London Borough of Camden. Please refer to Figure 1.1 below for site location.

Figure 1.1: Site Location

1.3 The site is surrounded by residential buildings and is located in close proximity of Tufnell Park tube station to the east and Kentish Town tube station to the south-east. Hampstead Heath Park is located approximately 500 meters to the north-west of the site.

Proposed Development

1.4 The site is approximately 0.18 hectares in area and comprises a part two, part three-storey building, originally built as an elderly persons home. The building comprises four wings arranged around a central courtyard.

1.5 The proposed development comprises the demolition of existing buildings and the erection of a six storey plus single storey basement building accommodating 50 Assisted Living residential apartments with associated communal and support facilities and ancillary cafe, salon and mini gym, together with external amenity spaces, car lift, basement parking, laundry, plant, CCTV, lighting, access, landscaping, infrastructure and other ancillary works.

Statement Scope

1.6 This Air Quality Assessment considers potential air quality impacts associated with construction and operation of the development, including dust from demolition / construction activities, and emissions from combustion of fossil fuels due to transportation, heating, and power generation. Development related changes to air quality have been considered in relation to UK Air Quality Objectives (AQO) and EU Air Quality Standards to determine significance. Also, where required, the air quality assessment considers mitigation measures to reduce the effect of the proposed development on local air quality.

1.7 This Assessment provides details of current local air quality conditions, and the potential of future residents to be exposed to levels of air pollution (PM_{10} and NO_2) in excess of UK Government Air Quality Objectives (UK AQOs).

1.8 For a variety of reasons, discussed in detail in Section 5, transportation associated with the redevelopment of the facility will not increase by more than the IAQM detailed assessment trigger level of 100AADT. As such, detailed modelling of emissions from transport is not required for this development.

1.9 The main source of pollution in the local area is emissions of NO_2 and PM_{10} from transportation. Most of the NO_2 exceedances occur at roadside locations (between 5 to 20 m from the kerb). Given that the setback distance between the nearest building on the development site and Highgate Road is approximately 130m, it is expected that NO_2 concentrations at the development site will remain below UK AQO limit vales. As such, a qualitative assessment of the potential impact of emissions from transportation sources on Highgate Road has been completed.

1.10 The currents plans are for the development to utilise Air Source Heat Pumps for heating and hot water of domestic/ non-domestic areas. As such, there will be no combustion of fossil fuels for heating on site so no detailed modelling is required at this stage. Should this design change modelling of emissions may be required.

1.11 The Assessment will also consider the impact of dust from demolition and construction activities in line with IAQM guidance on Planning for Construction Dust Emissions (2014).

Report Structure

1.12 This Air Quality Assessment has been prepared to assess the air quality-related implications of the proposed development to support a planning application. The remainder of the report is structured as follows:

- **Chapter 2** provides an overview of the UK Air Quality Objectives (AQO) and legislation relevant to the proposed development;
- **Chapter 3** sets out the existing baseline air quality conditions at the Site and the surrounding area;
- **Chapter 4** presents a Dust Impact Assessment, which discusses the potential impact of the demolition and construction on local air quality;
- **Chapter 5** provides general commentary on the significance of emissions introduced/ removed to the local area from traffic sources;
- **Chapter 6** presents the air quality neutral assessment**;**
- **Chapter 7** discusses the potential impact of current air quality conditions on future occupants; and
- **Chapter 8** presents conclusions of the Air Quality Assessment.

2.0 NATIONAL LEGISLATION AND LOCAL POLICY

2.1 The Environment Act 1995 placed a responsibility on UK Government to prepare an Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland. The most recent version of the strategy (2007) sets out the current UK framework for air quality management and includes several AQOs for specific pollutants.

2.2 The 1995 Act also requires that Local Authorities review and assess air quality in their areas, following a prescribed timetable. The Review and Assessment process is intended to locate and spatially define areas where the UK AQOs are not being met. In such instances, the Local Authority is required to declare an AQMA, carry out a Further Assessment of air quality, and develop an Air Quality Action Plan (AQAP), which should include measures to improve air quality so that the objectives may be achieved in the future. The timetables and methodologies for carrying out Review and Assessment studies are prescribed in Defra Technical Guidance – Local Air Quality Management Technical Guidance (LAQM.TG, 2016), and London Specific LAQM.TG, 2016.

2.3 Table 2.1 lists the objectives relevant to this assessment that are included in the Air Quality Regulations 2000 and (Amendment) Regulations 2002 for the purposes of LAQM.

Pollutant	Air Quality Objective	
	Concentration	**Measured as**
Nitrogen Dioxide (NO_2)	200 µg/m^3	1-hour mean not to be exceeded more than 18 times per year
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3	24-hour mean not to be exceeded more than 35 times per year
	40 µg/m^3	Annual mean

Table 2.1: Air Quality Objectives (England)

National Planning Policy

National Planning Policy Framework (NPPF) July 2018

2.4 The updated NPPF 2018 supersedes previous planning guidance documents and provides guidance for the delivery of the design quality aspirations of the NPPF:

2.5 Paragraph 103 emphasises on need to focus significant development at sustainable locations limiting need to travel and offering genuine mode choices in order to reduce congestion, emissions thereby improving air quality and public health.

2.6 Paragraph 181 emphasises on need for consideration to contribute towards compliance to relevant national targets for pollutants at planning stage. It states that "Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement."

Regional Planning Policy

The London Plan (2016)

2.7 The London Plan contains additional guidance for air quality and planning decisions under Policy 7.14. (Improving Air Quality).

2.8 From a strategic perspective, the Mayor recognises the importance of tackling air pollution and improving air quality to London's development and the health and well-being of its people. The London Plan focuses on the government working with strategic partners to ensure that the spatial, climate change, transport and design policies of this plan support implementation of Air Quality and Transport strategies to achieve reductions in pollutant emissions and minimize public exposure to pollution.

2.9 In reference to developments and planning decisions, the London Plan aims to:

a. Minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs)) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans (Policy 6.3);
b. Promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Councils' 'The control of dust and emissions from construction and demolition';
c. Aim for developments to be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs));
d. Ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches; and
e. Where developments require a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified.

The Mayor's Air Quality Strategy (2010)

2.10 Clearing the Air: The Mayor's Air Quality Strategy (AQS), was published in December, 2010. The document sets out a vision for tackling air pollution in London. Chapter 3 and 4 outline a

number of measures aimed at reducing emissions from transportation and buildings in order to protect public health and meet the UK Air Quality Objectives for all constituent pollutants.

2.11 The Mayor's AQS highlights a number of measures to reduce emissions:

From transport:

- Encouraging smarter choices and sustainable travel behaviour;
- Promoting technological change and cleaner vehicles;
- Reducing emissions from the public transport and public transport fleets; and
- Using emissions control schemes to reduce emissions from private vehicles.

From homes, business and industry:

- Promoting and delivering energy efficiency schemes;
- Using the planning system to reduce emissions from new developments; and
- Updating and implementing best practice on construction and demolition.

Targeting air quality priority location:

- Adopting local measures, including trialling new processes (such as the use of dust suppressants); and
- Using action days to encourage behaviour change and reduce pollution in priority areas.

Increasing awareness of air quality issues:

- Improving access to information about the health impacts of poor air quality; and
- Directing information about poor air quality to those most at risk.

Camden Local Plan 2016

2.12 The 2016 Camden Local Plan contains reference to Policy CC4, which focuses on mitigating the impact of development on air quality and to ensure exposure to poor air quality is reduced in the borough.

2.13 The policy states that

> *"The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough.*
>
> *The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.*

Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact. Similarly, developments that introduce sensitive receptors (i.e. housing, schools) in locations of poor air quality will not be acceptable unless designed to mitigate the impact."

3.0 BASELINE CONDITIONS

3.1 Baseline data were gathered from the following sources:

- LBC Air Quality Annual Status Report for 2015;
- GLA Data Store website (https://data.london.gov.uk/dataset); and
- DEFRA's national air quality background maps.

Air Quality Monitoring Data

3.2 LBC monitors NO_2 and PM_{10} concentrations in the air using a combination of automatic monitoring stations and passive diffusion tubes. The nearest monitoring sites are shown in Figure 3.1 and Table 3.1. Figure 3.1 also details a 1km buffer around the development site, which shows those monitoring sites within 1km of the development. Results from these sites for the years 2012 to 2015 are presented in Table 3.2.

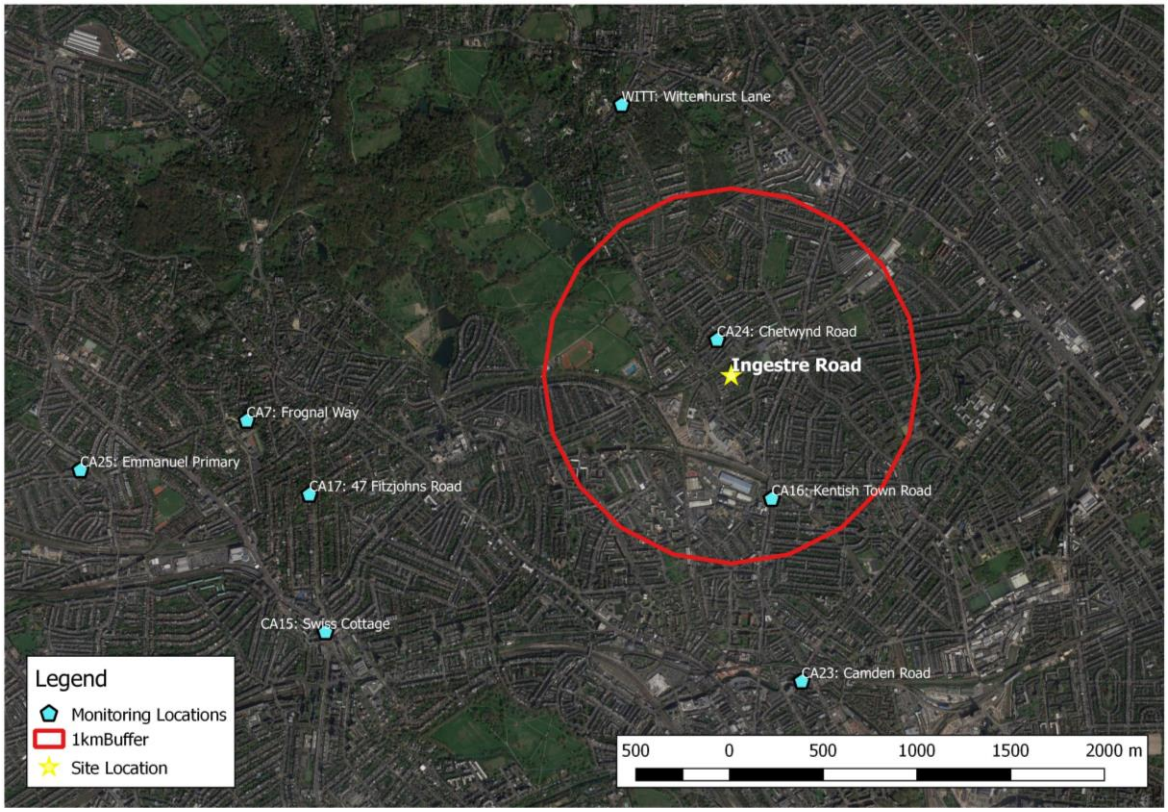

Figure 3.1: Air Quality Monitoring Locations

Site Name	Type	Pollutants	Distance from site
CA24: Chetwynd Rd	Roadside	NO_2	**<**1km
CA16: Kentish Town Rd	Roadside	NO_2	**<**1km
WITT: Wittenhurst Ln	Roadside	NO_2	**>**1km
CA23: Camden Rd	Roadside	NO_2	**>**1km
CA7: Frognal Way	Urban Background	NO_2	**>**1km
CA17: Fitzjohns Road	Roadside	NO_2	**>**1km

*****Background: An urban location distanced from sources and therefore broadly representative of citywide background conditions, e.g. urban residential areas.

******Roadside: A site sampling typically within one to five metres of the kerb of a busy road.

Table 3.1: Details of air quality monitoring sites

3.3 Results of long term NO_2 monitoring (Table 3.2) indicate that the annual mean NO_2 concentrations are exceeded at many roadside locations throughout Camden. The nearest monitoring location to the project site is CA24. NO_2 concentrations at this location were observed to be in exceedance of the NO_2 annual mean objective during 2016. However, this monitoring location is adjacent to Highgate Road, which experiences heavy traffic and, as a result, air pollution. The project site is not expected to experience similar levels of pollution due to the distance set back from Highgate Road (approx. 110m).

3.4 NO_2 results for 2017 were not available at the time of preparing the report.

Site Name/ID	Annual Mean NO_2 Concentrations (µg/m^3)			
	2013	**2014**	**2015**	**2016**
CA24: Chetwynd Rd	**47.8**	**44.8**	**46.5**	**42.0**
CA16: Kentish Town Rd	**65.3**	**57.8**	**63.6**	**58.7**
WITT: Wittenhurst Ln	**53.1**	**48.3**	**45.0**	**43.1**
CA23: Camden Rd	**77.9**	**72.2**	**63.3**	**61.7**
CA7: Frognal Way	32.0	28.6	27.8	27.9
CA17: Fitzjohns Road	**65.2**	**60.3**	**55.8**	**56.4**

Exceedance of the NO_2 annual mean air quality objective of 40 µg/m^3 are shown in **bold**.

Table 3.2: Annual mean NO_2 results

3.5 It should be noted that the above data is not representative of the development site. In fact, every monitoring location listed above, with the exception of Frognal Way, is a roadside monitoring location; site located within 5m of a busy road. Frognal Way is classified as an urban background monitoring site, and is therefore more likely to be comparable with the development site being set back from typical sources of urban pollution (e.g. busy roads).

3.6 Further, there are no automatic monitoring locations nearby the development site that can be viewed as providing information that is representative of conditions on Ingestre Road. As such, data from all other automatic / diffusion tube monitoring locations in Camden have not been included in this report.

3.7 The GLA produced 2013 air quality modelling maps showing NO_2 and PM_{10} concentrations for each borough. These maps are based on emissions data from the 2013 London Atmospheric Emission Inventory (LAEI). The maps provided as Figures 3.2 and 3.3 overleaf indicate that the site is located in an area where annual mean NO_2 and PM_{10} concentrations are within the national objective of 40 µg/m^3.

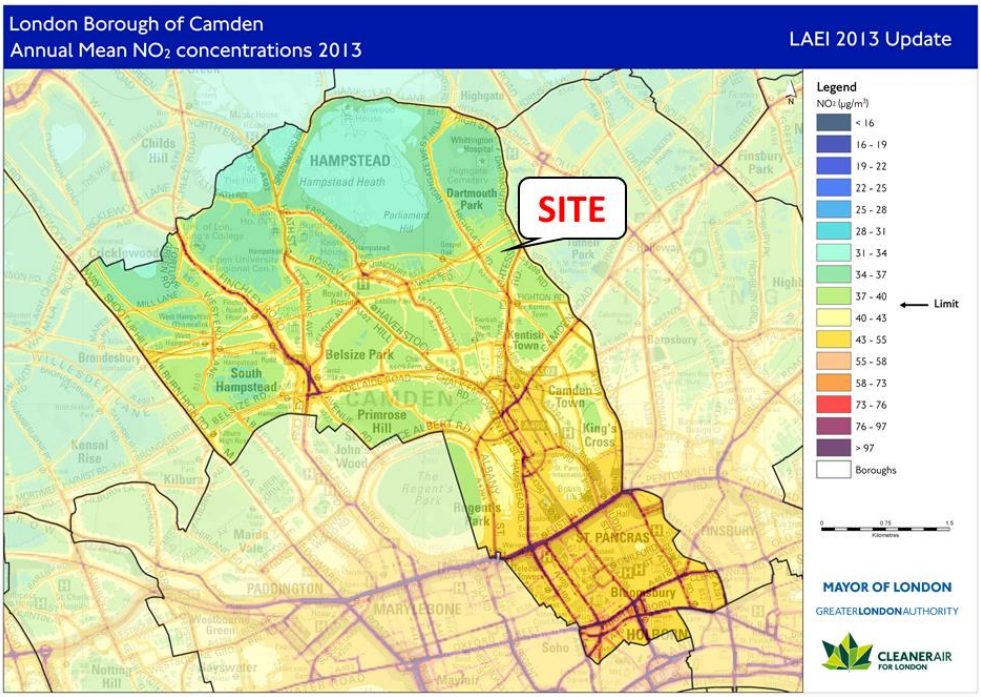

Figure 3.2: Modelled 2013 annual mean NO_2.

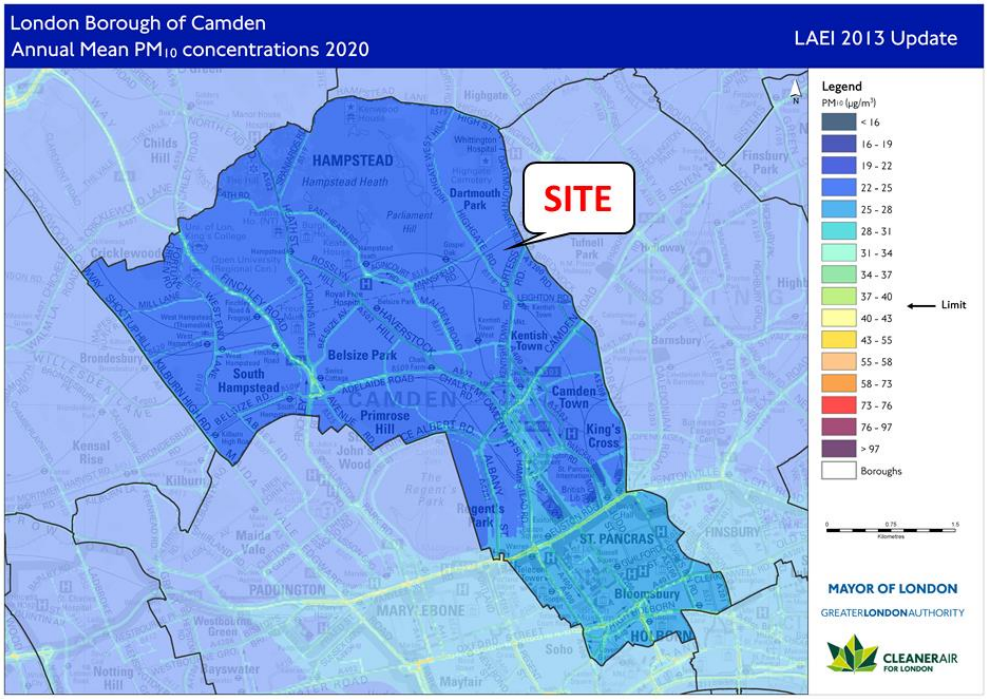

Figure 3.3: Modelled 2013 annual mean PM_{10}.

Mapped Background Pollution

3.8 The Defra website includes estimated background air pollution data for NO_x, NO_2 and PM_{10} for each 1km by 1km OS grid square. Background pollutant concentrations are modelled from the base year of 2015 based on ambient monitoring and meteorological data from 2015 and the website includes projections for future years. Estimated pollutant concentrations for the year 2018 in the OS grid square in which the proposed development site lies (centred at 528500, 185500) are shown in Table 3.3 below. Annual mean NO_x, NO_2 and PM_{10} concentrations are within the relevant objective.

Pollutant	2018 Annual Mean (µg/m^3)
NO_x	43.5
NO_2	27.9
PM_{10}	17.4

Table 3.3: Annual Mean Background Concentrations of NO_x, NO_2 and PM_{10}

Air Quality Focus Area

3.9 The GLA identified 187 Air Quality Focus Areas (AQFA) in London. AQFAs are locations where the annual mean NO_2 concentrations breach the national air quality objective (40µg/m^3) and where human exposure to air pollution is high. AQFAs are tools to help London boroughs to target action in the most problematic areas. The development site is not located within an AQFA. Figure 3.4 shows the development site in relation to AQFAs throughout Camden and neighbouring boroughs.

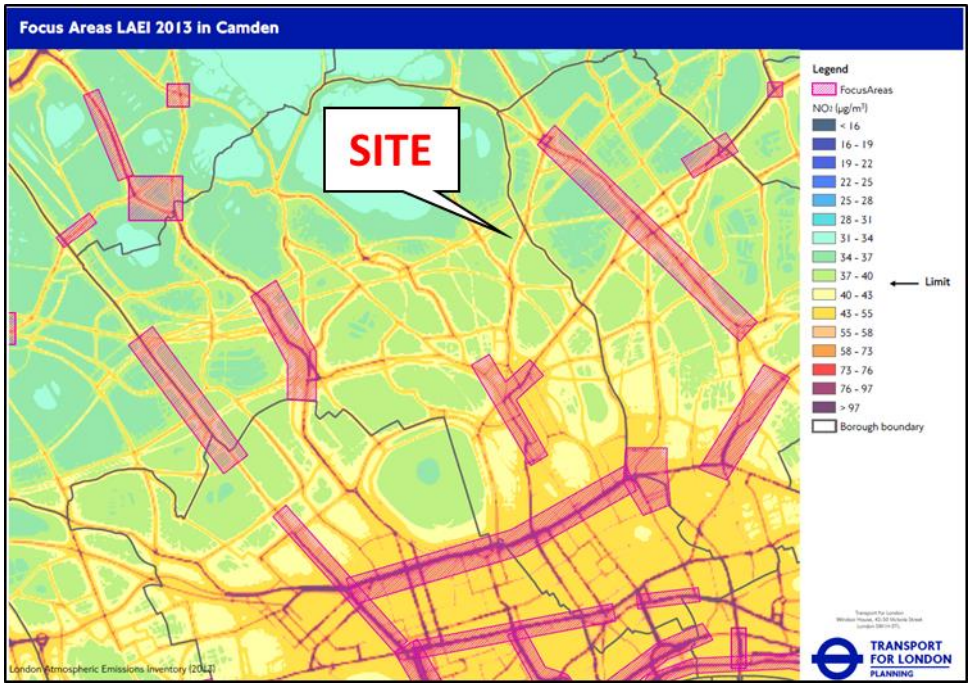

Figure 3.4: LBC Air Quality Focus Area in relation to the development site

4.0 DUST IMPACT ASSESSMENT

4.1 During the site demolition, earthworks and construction phases, there is the potential for emissions of dust to cause annoyance/ nuisance for sensitive receptors located close to the site.

4.2 Potential dust impacts associated with construction activities have been assessed in accordance with guidance from the IAQM (2014). The IAQM provides guidance on a step process to assess the potential impacts of construction dust pre-mitigation, provide mitigation measures specific to the risk and assess the post-mitigation impacts.

4.3 There are several sensitive receptors within close proximity of the site (less than 100 less than 100m from site); i.e. business properties, which could potentially be affected by dust emissions in relation to any of the above stages.

4.4 As detailed in Table 3.3, Defra background maps estimate that annual average background concentration of PM_{10} nearby the project site will be approximately 17.4 µg/m^3; below the UK AQO of 40 µg/m^3.

4.5 There is a Site of Importance for Nature Conservation (railway sidings) north of the site. However, there are no statutory protected Sites of Special Scientific Interest or Local Nature Reserves within 350m of the development site.

4.6 The proposed construction activities are estimated to last approximately 24 months. A dust assessment is therefore required to be undertaken and specific mitigation measures recommended.

4.7 The assessment procedure follows the following framework:

1. Screen the requirement for a more detailed assessment;
2. Assess the risk of dust impacts of the four phases of construction (demolition, earthworks, construction and trackout), considering:
    i. Dust Emission Magnitude;
    ii. Sensitivity of the area; and
    iii. Risk of Impact.
3. Determine the site-specific mitigation for the potential activities;
4. Examine the residual effects and determine whether these are significant; and
5. Prepare the Construction Dust Impact Assessment.

4.8 The construction activities associated with the proposed development can be separated into four stages:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

4.9 In February 2014, the IAQM published guidance on how to assess and mitigate the impacts of dust emissions from demolition and construction sites. This guidance has been followed to produce a construction dust risk assessment, included in Appendix A.

4.10 A summary of the dust risk impact assessment can be seen below, with full details presented in Appendix A.

4.11 Each activity has been assessed individually to determine a Dust Emissions Magnitude (DEM) in terms of their scale and nature of works. The level of magnitude is assessed against the sensitivity of the site to determine the potential risk of dust impacts, shown in Table 4.1 below.

Potential Risk	Site Specific Dust Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	MEDIUM	LOW	MEDIUM	LOW
Human Health	LOW	NEGLIGIBLE	LOW	LOW
Ecological	LOW	NEGLIGIBLE	LOW	LOW

Table 4.1: Summary of Potential Dust Risk Impact

4.12 The above summary demonstrates that the proposed development, pre-mitigation, has the potential to result in worst case MEDIUM impact upon sensitive receptors from dust soiling during demolition and construction, and LOW/ NEGLIGIBLE during the remaining site activities.

4.13 The mitigation measures detailed in Appendix A are recommended to ensure that the residual effect of construction dust on the receptors and surrounding area will always be temporary and, where possible, negligible.

Mitigation Measures

4.14 The mitigation measures outlined below should make up part of a Construction Environment Management Plan (CEMP) that should be implemented to minimise the potential of adverse construction dust impacts throughout all the relevant construction stages.

Demolition:

- Soft strip inside buildings before demolition;
- Bag and remove any biological debris or damp down such material before demolition; and
- Ensure effective water suppression is used during demolition operations, hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is required.

Construction:

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out unless required for a particular process;

- Mix large quantities of cement, grouts and other similar materials in enclosed areas remote from site boundaries and potential receptors;
- 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; and
- For small supplies of fine powder ensure bags are sealed after use and are stored appropriately to prevent dust release.

Trackout:

- Ensure any vehicles entering and leaving site are securely covered to prevent escape of materials during transport;
- Ensure all vehicles switch off engines when stationary, no idling vehicles;
- Routinely clean public roads and access routes using wet sweeping methods; and
- Avoid dry sweeping of large areas.

General Mitigation Measures:

- Ensure regular cleaning of hardstanding surfaces using wet sweeping methods;
- Display the head or regional office contact information, and the name and contact details of person(s) accountable for air quality on the site boundary;
- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Log all air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record all measures taken. Make the complaints log available to the Local Authority when asked;
- Carry out regular on-site and off-site inspections to monitor dust soiling effects, with cleaning to be provided if necessary. Increase the frequency of inspections when activities with a high potential to produce dust are being carried out;
- Erect barriers around the site, any dusty activities and stockpiles (to be covered);
- Screen areas of the building, where dust producing activities are taking place, with debris screens or sheeting;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Remove materials that have a potential to produce dust as soon as possible, unless being re-used. If they are to be re-used, on site covers should be used;
- Ensure all vehicles switch off engines when stationary, no idling vehicles;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine sprays on such equipment wherever possible; and
- Avoid the burning of waste materials.

4.15 It is important that attention is paid to any construction activity that takes place in close proximity to the site boundary, potentially at the closest location to sensitive receptors.

4.16 The implementation of the specific mitigation measures given above within a CEMP will ensure that the potential adverse impacts from construction dust during all construction stages are avoided. It is noted by the IAQM that through the use of effective mitigation, the effects of dust from construction activity will not normally be significant.

Construction Traffic and Plant

4.17 As previously stated, there is potential for air pollutant impacts to arise from construction plant and vehicles associated with the scheme. Currently the number of construction vehicles and construction plant have not been confirmed, however the following BAT (Best Available Technology) should still be implemented during the demolition and construction phases.

4.18 The construction traffic and plant mitigation measures recommended are as follows:

- All vehicles should switch off engines when stationary, no idling vehicles;
- On-road vehicles to comply with the requirements of the Low Emission Zone and the London NRMM standards, where applicable;
- All non-road mobile machinery (NRMM) to use ultra-low sulphur diesel (ULSD) where available;
- Minimise the movement of construction traffic around the site;
- Maximising efficiency (this may include alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing);
- Vehicles should be well maintained and kept in a high standard of working order;
- Avoid the use of diesel or petrol-powered generators by using mains electricity or battery powered equipment where possible; and
- Locate plant away from boundaries close to residential areas.

5.0 EMISSIONS FROM TRANSPORTATION AND BUILDING OPERATIONS

Transportation Emissions

5.1 The site currently consists of a part two-story, part three-story purpose built elderly persons home on the south side of Ingestre Road, surrounded by a housing estate. The home consists of four wings arranged around a central courtyard. The current Site was decommissioned in 2013, before which it comprised of a dementia care home accommodating 48 residents.

5.2 The existing care home has no on-site vehicular parking or cycle parking provision.

5.3 The proposals are for the demolition and redevelopment of the former care home site to provide a new Assisted Living facility accommodating up to 50 units (8 x 3-bed, 41 x 2-bed and 1 x 1-bed apartments) in a building six storeys in height.

5.4 The basement of the proposed development will have 8 blue badge parking spaces, 2 concierge spaces, 7 Sheffield stands for staff and 31 Sheffield stands for residents.

5.5 The basement layout plan also show that there will be 10 mobility scooter charging points for the residents to use.

5.6 The proposed development will increase the number of beds from 48 to 107 (8 x 3-bed, 41 x 2-bed and 1 x 1-bed apartments), and will also result in an increase in cycle and mobility scooter parking, whilst only providing essential vehicular parking for disabled residents and concierge use.

5.7 A Travel Plan is being put in place across the site to implement further measures to encourage the use of more sustainable modes of transport such as buses and the underground network as well as active transport such as walking and cycling which would be well accommodated by existing infrastructure in the area. In turn this will help to discourage the use of private cars to and from the Site.

5.8 It is considered that daily vehicle movements generated by the redevelopment of the care home will not increase in short term, and, in the longer term and over the five-year Travel Plan period, there is likely to be a slight reduction in car ownership and use at the site, resulting in a slightly positive impact on the local area with respect to reduced emissions from vehicles.

5.9 Based on the above, an in line with the IAQM Guidance on AQ for Planning, the re-development will not increase traffic by more than 100AADT. As such, a detailed modelling assessment of the impact of traffic from the development on local air quality is not required.

Building Emissions

5.10 The current design is based on a community heating scheme which will be individually metered at each domestic unit. Air Source Heat Pumps (ASHP) will satisfy the domestic hot water (DHW) and heating requirements for the units.

5.11 Domestic Units will comprise:

- Underfloor heating to the lounge, dinning, kitchen and bathrooms;
- Fan assisted radiators in bedrooms;
- DHW provision is currently being reviewed to establish if there will be better performance/ energy saving by generating centrally vs using heat pump temperatures with local cylinders and balance of lower temperatures; and
- Ventilation will be natural to living space with dedicated extracts for bathrooms and kitchen with appropriate controls.

5.12 Non-Domestic Units will comprise:

- Public areas will be satisfied with reverse cycle heat pumps for heating and cooling;
- DHW will be from a storage cylinder linked to the central ASHP;
- Corridors will have background heating using fan assisted radiators; and
- Ventilation will be mechanical using ceiling mounted heat recovery units with an efficiency of 80% with CO_2 sensors to modulate airflow based on occupancy.

5.13 Based on the above information, there will be no combustion of natural gas on site. As such, there is no requirement to undertake a detailed modelling assessment as there are no emissions from point sources planned.

6.0 AIR QUALITY NEUTRAL ASSESSMENT

Building Emissions Assessment

6.1 London Plan Policy 7.14 requires development proposals within Greater London to be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (e.g. developments situated within an AQMA). A method for assessing this is outlined in the Sustainable Design and Construction SPG (April, 2014).

6.2 As mentioned above, the current design is based on a community heating scheme which will be individually metered at each domestic unit. Air Source Heat Pumps (ASHP) will satisfy the domestic hot water (DHW) and heating requirements for the units.

6.3 Based on the above information (Section 5), there will be no combustion of natural gas on site. As such, there is no requirement to undertake an Air Quality Neutral Assessment for building emissions.

Transport Emissions Assessment

6.4 For each land-use class, the number of vehicle movements generated by the operation of the development has been provided by the project's transport consultants. The average trip length (km) for each land-use class could not be provided; however, consistent with the examples provided in the Air Quality Neutral Planning Support Update, the average London distances driven per annum for the different development categories have been obtained. The number of vehicle movements has been multiplied by the average distances driven for each land use class to derive the vehicle km term. The total vehicle km for the development has then been multiplied by the NO_X and PM_{10} emission factors (in kg/annum) provided in the SPG to determine the 'Total Development Transport Emissions'.

6.5 The GLA Policy Guidance Document (Ref 80371, Air Quality Consultants, 2014) provides Transport Emissions Benchmark (TEB) factors for NO_X and PM_{10} as mass emissions per dwelling per annum for residential properties. A separate TEB for each pollutant (NO_X and PM_{10}) has been calculated. A 'Total TEB' has been calculated as the total of the individual TEBs for each pollutant.

6.6 The TEBs are based on a limited range of land-use categories to match the London Travel Demand Survey (LTDS) data as closely as possible. Table 12 or the GLA Policy Guidance Document shows those land-use categories for which it has been possible to produce a specific TEB and those for which it has not been possible. Where a specific TEB is not provided, a recommended approach is provided where possible. For example, there is not TEB for C2 developments and so the C3 TEB can be applied.

6.7 For each pollutant, the 'Total Development Transport Emissions' have been compared with the 'Total TEB'. Where the 'Total Development Transport Emissions' exceeds the 'Total TEB', the need for on or off-site mitigation has been identified.

6.8 Tables 6.5 and 6.6 set out the annual mass of NO_X and PM_{10} emitted by the proposed development per annum, respectively.

Land Use Classes	Development Trip Rate (# vehicles/ day)	Average Trip Length (km)	Vehicle km/ annum	Development Emissions NOx (kg/annum)
Residential (C2/ C3)	20	11.4	83,220	31
Retail (A1)	20	11.4	83,220	31
Office (B1)	30	11.4	124,830	46
			Total Transport NOx Emissions	**108**

Table 6.5: Total Development Transport Emissions NOx

NOx emission factor for inner London = 0.370 g/km

Land Use Classes	Development Trip Rate (# vehicles/ day)	Average Trip Length (km)	Vehicle km/ annum	Development Emissions PM_{10} (kg/annum)
Residential (C2/ C3)	20	11.4	83,220	6
Retail (A1)	20	11.4	83,220	6
Office (B1)	30	11.4	124,830	8
			Total Transport PM_{10} Emissions	**20**

Table 6.6: Total Development Transport Emissions PM_{10}

PM_{10} emissions factor for outer London = 0.0665 g/vehicle.km

6.9 Tables 6.7 and 6.8 set out the benchmark mass emissions of NO_X and PM_{10} against which the transport emissions from the development have been compared.

Land Use Classes	Gross Internal Area (m2)	Number of Dwellings	NOx TEB (g/m^2/annum or g/dwelling/annum)	Benchmarked NOx Emissions (kg/annum)
Residential (C2/ C3)	4,982	20	558	11
Retail (A1)	2,160	-	219	473
Office (B1)	512	-	11.4	6
			Total Transport NOx Emissions	**490**

Table 6.7: Total Benchmarked Transport Emissions NOx

Land Use Classes	Gross Internal Area (m2)	Number of Dwellings	PM TEB (g/m^2/annum or g/dwelling/annum)	Benchmarked NOx Emissions (kg/annum)
Residential (C2/ C3)	4,982	20	100	2
Retail (A1)	2,160	-	39.3	85
Office (B1)	512	-	2.05	1
			Total Transport PM_{10} Emissions	**88**

Table 6.8: Total Benchmarked Transport Emissions PM_{10}

6.10 Table 6.9 provides a comparison of the development transport emissions with the benchmark.

	Total Development Transport Emissions	Total Benchmarked Transport Emissions	Total Development – Benchmarked Transport Emissions
NOx (kg/annum)	108	490	-382
PM_{10} (kg/annum)	20	88	-68

Table 6.9: Summary of Transport Results

6.11 For NOx, the Total Development Transport Emissions are 382kg/ annum less than the Total Benchmarked Transport Emissions. For PM_{10}, the Total Development Transport Emissions are 68kg/ annum less than the Total Benchmarked Transport Emissions.

Mitigation

6.12 The results of the air quality neutral assessment demonstrate that the total traffic emissions do not exceed the relevant transport emission benchmarks, and so additional mitigation measures are not required in this case.

Conclusions

6.13 The results of the air quality neutral transport assessment demonstrate that traffic emissions do not exceed the calculated benchmark for this development.

7.0 EXPOSURE OF FUTURE OCCUPANTS

7.1 The majority of the air quality limit value exceedances occur at roadside locations (i.e. between 5 to 20 metres from the kerbside). Given that the setback distance between the development site and Highgate Road is approximately 110 metres, and 40 metres from the railway line, it is expected that NO_2 and PM_{10} concentrations at the development façades will not exceed the UK AQOs.

7.2 Baseline air quality data, presented in Section 3 of this report, indicate that air quality objectives are met at the development site. It is, therefore, assessed that ambient air quality does not pose a significant risk to future site occupants.

Figure 7.1: Site and Vicinity of Highgate Road and Railway

8.0 SUMMARY AND CONCLUSIONS

8.1 The proposed development is situated within an AQMA declared by London Borough of Camden Council. The AQMA covers the whole borough and it is declared on the basis that levels of NO_2 do not meet the UK AQOs at certain locations across borough. However, air quality monitoring and modelling data taken from the vicinity of the development site indicate that the national air quality objectives are met at the development site area.

8.2 Generally, exceedances of the NO_2 objective occur at roadside locations (between 5 to 20 m from the kerb). Given that the setback distance between the development site and Highgate Road is approximately 110m, it is expected that NO_2 concentrations at the development site will remain below UK AQOs and that future residents will not be exposed to NO_2 and PM_{10} pollution that exceeds UK air quality standards.

8.3 A dust impact assessment has been undertaken for the demolition and construction phase associated with the proposed development in accordance with IAQM and GLA guidance on the assessment of dust from demolition and construction. Given the close proximity of sensitive receptors, appropriate mitigation measures should be implemented in order to minimise the potential risk of nuisance. These mitigation measures, outlined in this report, should be included in a Construction Environment Management Plan (CEMP), which should be implemented to minimise the potential of adverse construction dust impacts throughout all the relevant construction stages.

8.4 Vehicular movements generated by the redevelopment of the facility will not result in a significant increase. The Transport Assessment, concludes that there will be a slight increase in traffic initially, however during the five-year lifecycle of the Travel Plan, traffic to and from the site will reduce. As such, a detailed modelling assessment of the impact on air quality is not required.

8.5 Results of the air quality neutral transport assessment indicates that NO_x and PM_{10} emissions traffic activity related to the development are lower than the relevant GLA benchmarks, and the development is considered air quality neutral from a transport emissions perspective. However, additional mitigation measures such as substantial bicycle/ mobility scooter storage facilities have been incorporated into the development design.

8.6 Due to the energy philosophy relying on Air Source Heat Pumps for domestic hot water and heating, the is no requirement to complete an air quality neutral assessment for building emissions, since there will be no combustion sources on site.

9.0 DISCLAIMER

9.1 Create Consulting disclaims any responsibility to Four Quarters (Ingestre Road) Ltd and others in respect of any matters outside the scope of this report.

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10.0 REFERENCES

i. *Air Quality Annual Status Report, London Borough of Camden*, 2015;

ii. *Control of dust and emissions from construction and demolition: Best Guidance Practice.* Greater London Authority and London Councils (2006).

iii. *Clearing the Air: The Mayor's Air Quality Strategy*. GLA, London. Greater London Authority, 2010.

iv. GLA Air Quality Neutral Policy Guidance Document. Ref 80371. Air Quality Consultants, 2014.

v. *Sustainable Design and Construction Supplementary Planning Guidance*. Greater London Authority, 2014.

vi. *National Planning Policy Framework*. Department of Communities and Local Government, 2012.

vii. Holman et al. *IAQM Guidance on Planning for Air Quality,* Institute of Air Quality Management, London, 2014. www.iaqm/wpcontent/uploads/guidance/dust_assessment.pdf.

viii. Holman et al. *IAQM Guidance on the assessment of dust from demolition and construction*, Institute of Air Quality Management, London, 2014. www.iaqm/wpcontent/uploads/guidance/dust_assessment.pdf.

APPENDICES

APPENDIX A

Construction Dust Risk Assessment

CONSTRUCTION DUST ASSESSMENT

A.1 The construction dust assessment has been completed in accordance with 2014 IAQM guidance and follows the procedure as outlined in Section 4 of this report.

Screen the Need for a Detailed Assessment

A.2 The following screening criterion has been applied to the assessment: An assessment will normally be required where there is:

- a 'human receptor' within:
  - 350m of the boundary of the site; or
  - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).
- an 'ecological receptor' within:
  - 50m of the boundary of the site; or
  - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

A.3 There are a number of human receptors within 350m of the site boundary but no ecological receptors within 50m of the site. However, a dust assessment is still required due to the proposed development location meeting the 'human receptor' portion of the above criteria.

Assess the Risk of Dust Impacts

A.4 The assessment of the risk of dust impacts was completed in three stages:

- **STEP-2A**: Determine the potential Dust Emission Magnitude (DEM);
- **STEP-2B**: Determine the sensitivity of the area to dust impacts; and
- **STEP-2C**: Using DEM and area sensitivity to estimate potential dust impact significance.

STEP 2A – Define Dust Emission Magnitude

A.5 The potential Dust Emission Magnitude (DEM) for all four of the construction activities were determined to be Small, Medium or Large according to the criteria presented in Table A.1.

Construction Activity	Dust Emission Magnitude Scale		
	SMALL	**MEDIUM**	**LARGE**
Demolition	• Total volume of building to be demolished <20,000m^3, or • Construction material with low potential for dust release (e.g. metal cladding or timber), or • Demolition activities <10m above ground demolition during wetter months.	• Total volume of building to be demolished 20,000m^3 – 50,000m^3, or • Potentially dusty construction material, or • Demolition activities 10-20m above ground level;	• Total volume of building to be demolished >50,000m^3, or • Potentially dusty construction material (e.g. concrete), or • On-site crushing and screening, or • Demolition activities <20m above ground level;
Earthworks	Total site area <2,500m^2, soil type with large grain size, <5 heavy earth moving vehicles active at one time, bunds <4m high, total material moved <20,000t, works during wetter months.	Total site area 2,500-10,000m^2, moderately dusty soil type, 5-10 heavy earth moving vehicles active at one time, bunds 4-8m high, total material moved 20,000-100,000t.	Total site area >10,000m^2, potentially dusty soil type, >10 heavy earth moving vehicles active at one time, bunds >8m high, total material moved >100,000t.
Construction	Total building volume <25,000m^3, construction material with low potential for dust release.	Total building volume 25,000-100,000m^3, potentially dusty construction material, on site concrete batching.	Total building volume >100,000m^3, on site concrete batching, sandblasting.
Trackout	<10 HDV* outwards movements in any one day, surface material with low potential for dust release, unpaved road length <50m.	10-50 HDV outward movements in any one day, moderately dusty surface material, unpaved road length 50-100m.	>50 HDV outward movements in any one day, potentially dusty surface material, unpaved road length >100m.
* HDV – Heavy Duty Vehicle (>3.5t), Note – In each case, not all the criteria need to be met, and that other criteria may be used if justified.			

Table A.1: Dust Emission Magnitude Criteria

A.6 The completed assessment of Dust Emission Magnitude is shown in Table A.2 below.

Construction Activity	Dust Emission Magnitude	Justification
Demolition	**MEDIUM**	• Total volume of building to be demolished 20,000m3 – 50,000m3, or • Potentially dusty construction material, or • Demolition activities 10-20m above ground level;
Earthworks	**SMALL**	Total site area <2,500m2, soil type with large grain size, <5 heavy earth moving vehicles active at one time, bunds <4m high, total material moved <20,000t, works during wetter months.
Construction	**MEDIUM**	Total building volume 25,000-100,000m3, potentially dusty construction material, on site concrete batching.
Trackout	**MEDIUM**	10-50 HDV outward movements in any one day, moderately dusty surface material, unpaved road length 50-100m.

Table A.2: Dust Emission Magnitude Assessment

STEP 2B – Define Area Sensitivity

A.7 The sensitivity of the area has been assessed in relation to a number of factors such as:

- Dust Soiling Effects;
- Effects on Human Health; and
- Effects on Ecological Receptors.

A.8 Dust Soiling Effects and an area's sensitivity to dust soiling can be defined by definitions shown in Table A.3.

SENSITIVITY	Dust Soiling Effects – 2Bi
HIGH	High sensitivity receptor criteria: • Users can reasonably expect an 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 and car showrooms.
MEDIUM	Medium sensitivity receptor criteria: • Users would expect to enjoy a reasonable level of amenity but would not reasonably expect to enjoy the same level of amenity as in their home; or • The appearance, aesthetic or value of their property could be diminished by soiling; or • The people or property would not reasonably be expected 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.
LOW	Low sensitivity receptor criteria: • The enjoyment of amenity would not reasonably be expected; or • Property would not reasonably be expected 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 and roads.

Table A.3: Dust Soiling Effects Definitions

A.9 The potential for dust to impact on human health can be defined using Table A.4.

SENSITIVITY	2Bii – Sensitivity of People to Health Effects
HIGH	High sensitivity receptor criteria: • 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 could be one where individuals may be exposed for eight hours or more in a day). • 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.
MEDIUM	Medium sensitivity receptor criteria: • Locations where the people exposed are workers, 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 workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation
LOW	Low sensitivity receptor criteria: • Locations where human exposure is transient; and • Indicative examples include public footpaths, playing fields, parks and shopping streets.

Table A.4: Human Health Effects Definitions

A.10 The potential for dust to impact on ecological receptors can be defined using Table A.6.

SENSITIVITY	2Biii – Sensitivity of Ecological Receptors
HIGH	High sensitivity receptor criteria: • 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.
MEDIUM	Medium sensitivity receptor criteria: • 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.
LOW	Low sensitivity receptor criteria: • 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

Table A.5: Ecological Receptors Definitions

Receptor Sensitivity	Number of Receptors	Distance from the source (m)			
		<20	<50	<100	<350
HIGH	**>100**	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
MEDIUM	**>1**	Medium	Low	Low	Low
LOW	**>1**	Low	Low	Low	Low

Table A.6: Sensitivity of the Area to Dust Soiling Effects of People and Property

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the source (m)				
			<20	<50	<100	<200	<350
HIGH	>32 µg m^{-3}	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg m^{-3}	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg m^{-3}	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg m^{-3}	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
MEDIUM	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
LOW	-	>1	Low	Low	Low	Low	Low

Table A.7: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Distance from the source (m)	
	<20	<50
HIGH	High	Medium
MEDIUM	Medium	Low
LOW	Low	Low

Table A.8: Sensitivity of the Area to Ecological Impacts

A.11 In addition to Tables A.6, A.7 and A.8 any site-specific factors have been taken into account when defining the sensitivity of the area:

- 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; and
- The duration of the potential impact, as a receptor may become more sensitive over time.

A.12 Table A.9 summaries the sensitivity of the project site in terms of dust soiling, human health and ecological receptors. Sensitivities outcomes defined using Tables A.3, A.4 and A.5 should be combined with Tables A.6, A.7 and A.8 in order to understand the overall sensitivity of the surrounding area (Table A.9)

Potential Risk	Sensitivity of Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	MEDIUM	MEDIUM	MEDIUM	MEDIUM
Human Health	LOW	LOW	LOW	LOW
Ecological	LOW	LOW	LOW	LOW

Table A.9: Summary of Site Sensitivity

Step 2C: Potential Dust Impact Risk

A.13 The DEM determined in Step 2A should be combined with the sensitivity of area determined in Step 2B to determine the risk of impacts, with no mitigation applied. The matrices shown in IAQM (2014) section 7.4 provide a method of assigning a level of risk for each activity. This should be used to determine the level of mitigation that should be applied. For the categories where risk is negligible no mitigation beyond those required by legislation is required.

The risk of dust impacts for four activities is summarised in Table A.10.

Potential Risk	Site Specific Dust Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	MEDIUM	LOW	MEDIUM	LOW
Human Health	LOW	NEGLIGIBLE	LOW	LOW
Ecological	LOW	NEGLIGIBLE	LOW	LOW

Table A.10: Summary of Dust Risk

Site-specific Mitigation

A.14 From the identification of the risk of impacts with no mitigation applied in Table A.6, it is possible to determine the specific mitigation measures that can be applied in relation to the level of risk associated with the construction activity. The mitigation measures described below are suggested as measures that should be included in a site-specific Construction Environmental Management Plan (CEMP).

Demolition

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust);
- Wherever reasonably practicable, retain walls and windows while the rest of the building is demolished to provide a screen against dust;
- Bag and remove any biological debris or damp down such material before demolition; and

- Ensure effective water suppression is used during demolition operations, hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is required.

Construction:

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out unless required for a particular process;
- Mix large quantities of cement, grouts and other similar materials in enclosed areas remote from site boundaries and potential receptors;
- 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; and
- For small supplies of fine powder ensure bags are sealed after use and are stored appropriately to prevent dust.

Trackout:

- Ensure any vehicles entering and leaving sites are securely covered to prevent escape of materials during transport;
- Ensure all vehicles switch off engines when stationary, no idling vehicles;
- Ensure any vehicles entering and leaving sites are securely covered to prevent escape of materials during transport;
- Routinely clean public roads and access routes using wet sweeping methods; and
- Avoid dry sweeping of large areas.

General Mitigation Measures:

- Ensure regular cleaning of hardstanding surfaces using wet sweeping methods;
- Display the head or regional office contact information, and the name and contact details of person(s) accountable for air quality on the site boundary;
- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Log all air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record all measures taken. Make the complaints log available to the Local Authority when asked;
- Carry out regular on-site and off-site inspections to monitor dust soiling effects, with cleaning to be provided if necessary. Increase the frequency of inspections when activities with a high potential to produce dust are being carried out;
- Erect barriers around the site, any dusty activities and stockpiles (to be covered);
- Screen areas of the building, where dust producing activities are taking place, with debris screens or sheeting;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Remove materials that have a potential to produce dust as soon as possible, unless being re-used. If they are to be re-used, on site covers should be used;

- Ensure all vehicles switch off engines when stationary, no idling vehicles;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine sprays on such equipment wherever possible; and
- Avoid bonfires and the burning of waste materials.

A.15 It is important that attention is paid to any construction activity that takes place in close proximity to the site boundary, potentially at the closest location to sensitive receptors.

A.16 The implementation of the specific mitigation measures given above within a CEMP will ensure that the potential adverse impacts from construction dust during all construction stages are avoided. It is noted by the IAQM that through the use of effective mitigation, the effects of dust from construction activity will normally be not significant.

Determine Significant Effects

A.17 Prior to the implementation of any mitigation measures the highest significance of adverse effects was MEDIUM, LOW, or NEGLIGIBLE, depending on the specific activity. The mitigation measures listed have been chosen due to their suitability to the site and to further reduce the risk of adverse effects from the four stages of construction.

A.18 Through the implementation of the site-specific mitigation measures, which should be secured by planning condition, are designed to mitigate potential dust impact. These will ensure that adverse dust effects will not occur and the residual effect will normally be negligible and not significant.

Conclusions of Construction Dust Assessment

A.19 The completion of the construction dust assessment has shown that the residual effect of the proposed development in the context of construction dust emissions will be 'NEGLIGIBLE'. This conclusion has been made based on the assumption that the suggested mitigation measures will be implemented (secured by planning condition) and is relevant for all sensitive receptors within 350m of the site.

A.20 It is important to note that even with a rigorous CEMP in place, it is not possible to guarantee that all mitigation measures will be effective at all times. If there is an interruption in the water supply used for dust suppression or adverse weather conditions are experienced that exacerbate dust emissions, the receptors may experience occasional, short term dust annoyance.

A.21 However, the likely scale of this would not normally be considered sufficient to change the conclusion that with mitigation the effects will be 'not significant'. It is therefore important to consider all mitigation measures and provide a frequent review and assessment procedure for each when in place to ensure that they continue to provide a full level of mitigation.