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LAND TO THE WEST OF HATFIELD

Environmental Statement – Chapter 7: Air Quality

Arlington Business Parks GP Limited

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1 CONTENTS

7 AIR QUALITY

7.1 INTRODUCTION

This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of Air Quality and is supported by Appendix 7.1, Appendix 7.2 and Appendix 7.3 to this ES.

The assessment describes the scope, relevant legislation, assessment methodology and the baseline conditions currently existing at the application site and its surroundings. It then considers any potentially significant environmental affects the proposed development may have on this baseline environment; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual impacts after these measures have been employed. It also considers the suitability of the site for the proposed end-use.

7.2 METHODOLOGY

The Air Quality assessment has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. These are summarised below.

7.2.1 Legislation and Planning Policy Guidance

7.2.1.1 National Air Quality Strategy

The United Kingdom Air Quality Strategy (UK AQS) for England, Scotland, Wales and Northern Ireland[1], last updated in 2007, sets out the Government's policies aimed at delivering cleaner air in the United Kingdom (UK). It sets out a strategic framework within which air quality policy will be taken forward in the short to medium term, and the roles that Government, industry, the Environment Agency (EA), local government, business, individuals and transport have in protecting and improving air quality.

7.2.1.2 Air Quality Standards

The Air Quality Standards Regulations 2010 (the regulations) transpose the Ambient Air Quality Directive (2008/50/EC), and transpose the Fourth Daughter Directive (2004/107/EC) within UK legislation. The regulations include Limit Values, Target Values, Objectives, Critical Levels and Exposure Reduction Targets for the protection of human health and the environment (collectively termed Air Quality Assessment Levels (AQAL) throughout this report).

Those relevant to this Air Quality Assessment are presented within

[1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA. July 2007.

Table ***7.1***.

Table 7.1: Relevant Air Quality Strategy Standards and Objectives

Pollutant	Standard (µg/m^3)	Measured As	Equivalent percentile
Nitrogen Dioxide (NO_2)	40	Annual Mean	-
	200	1-hour Mean	99.79th percentile of 1-hour means (equivalent to 18 1-hour exceedences)
Particulate matter within an aerodynamic diameter of less than 10µm (PM_{10}) (gravimetric)	40	Annual Mean	-
	50	24-hour mean	90.41th percentile of 24-hour means (equivalent to 35 24-hour exceedences)
Particulate matter within an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$) (gravimetric)	25	Annual Mean	-

7.2.1.3 Local Air Quality Management

Section 82 of the Environment Act 1995 (Part IV) requires local authorities to periodically review and assess the quality of air within their administrative area. The reviews have to consider the present and future air quality and whether any AQALs prescribed in regulations are being achieved or are likely to be achieved in the future.

Where any of the prescribed AQALs are not likely to be achieved the authority concerned must designate an Air Quality Management Area (AQMA). For each AQMA the local authority has a duty to draw up an Air Quality Action Plan (AQAP) setting out the measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the AQAL. As such, Local Authorities (LAs), have formal powers to control air quality through a combination of LAQM and by use of their wider planning policies.

7.2.1.4 Applicable Public Exposure

In accordance with the Department for Environment, Food and Rural Affairs' (DEFRA) technical guidance on Local Air Quality Management (LAQM.TG(16)), the AQOs should be assessed at locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective. A summary of relevant exposure for the objectives presented in

Table ***7.1*** are shown below in Table 7.2.

Table 7.2 : Relevant Public Exposure

Objective Averaging Period	Relevant Locations	Objectives should apply at	Objectives should not apply at
Annual Mean	Where individuals are exposed for a cumulative period of 6-months in a year	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	Where individuals may be exposed for eight hours or more in a day	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term
1-hour mean	Where individuals might reasonably be expected to spend one hour or longer	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

7.2.1.5 General Dust Legislation

Part III of the Environmental Protection Act (EPA) 1990 (as amended) contains the main legislation on Statutory Nuisance and allows local authorities and individuals to take action to prevent a statutory nuisance. Section 79 of the EPA defines, amongst other things, smoke, fumes, dust and smells emitted from industrial, trade or business premises so as to be prejudicial to health or a nuisance, as a potential Statutory Nuisance.

Fractions of dust greater than 10µm (i.e. greater than PM_{10}) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK AQS. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

7.2.1.6 National Policy

The 2018 update to the National Planning Policy Framework (NPPF) describes the policy context in relation to pollutants including air pollutants:

> *'Para 170: Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of […] air […]pollution […]. Development should, wherever possible, help to improve local environmental conditions such as air […] quality […]'*
>
> *'Para 180: 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.'*

Specifically in terms of development with regards to air quality:

> *'Para 181: 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.'*

The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG) which includes guiding principles on how planning can take account of the impacts of new development on air quality. In regards to air quality, the PPG states:

> *'Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with EU Limit Values […] It is important that the potential impact of new development on air quality is taken into account […] where the national assessment indicates that relevant limits have been exceeded or are near the limit.'*
>
> *'Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife).'*

The PPG sets out the information that may be required within the context of a supporting air quality assessment, stating that "*assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality* […] *Mitigation options where necessary, will depend on the proposed development and should be proportionate to the likely impact*".

The policies within the NPPF and accompanying PPG in relation to air pollution are considered within this Air Quality Assessment.

7.2.1.7 Local Policy

Welwyn Hatfield District Plan

WHC are in the process of preparing a new Local Plan, which has been submitted to the Secretary of State for Communities and Local Government for formal examination. The Local Plan will provide a long-term spatial vision, over the period up to 2032. However, at the time of writing this new Local Plan has yet to be formally adopted following formal examination.

Planning applications are currently decided upon primarily by using the policies of the District Plan originally adopted in 2005. A number of policies have been 'saved' until it is replaced by a Local Development Framework.

The following saved policy content relating to air quality is contained within the 2005 District Plan:

> *"Policy R18 – Air Quality*
>
> *The Council will have regard to the potential effects of a development on local air quality when determining planning applications. Consideration will be given to both the operational characteristics of the development and to the traffic generated by it. Any development within areas designated as Air Quality Management Areas must have regard to guidelines* for ensuring air quality is maintained at acceptable levels as set out in the Air Quality Strategy."

Hertfordshire Health and Wellbeing Planning Guidance

The Local Authorities of Hertfordshire, including WHC, have collectively adopted Health and Wellbeing Planning Guidance (May 2017) to aid planning professionals, both local authorities and developers in the delivery of healthy developments and communities by increasing local capacity, knowledge of health and wellbeing and the relationship to spatial planning issues. The document focuses on seven key areas, including air quality. Under the requirements of air quality, the guidance considers that a 'healthy development' should:

- Implement measures to improve air quality;
- Facilitate sustainable modes of transport, use of low emission vehicles e.g. electric vehicles and enable active travel;
- Locate key facilities, services and vulnerable communities away from traffic hotspots; and
- Address mitigation from the outset, setting out a clear approach to exposure and introducing receptors (residents) to an area of poor air quality, with a focus on design-led solutions.

7.2.1.8 Relevant Guidance

DEFRA 'LAQM.TG(16)'

DEFRA Local Air Quality Management Technical Guidance[2] (LAQM.TG(16)) was published for use by local authorities in their LAQM review and assessment work. The document provides key guidance in aspects of air quality assessment, including screening, use of monitoring data, and use of background data that are applicable to all air quality assessments.

EPUK & IAQM 'Land-use planning and development control Planning for Air Quality'

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have together published guidance[3] to help ensure that air quality is properly accounted for in the development control process. It clarifies when an air quality assessment should be undertaken, what it should contain, and how impacts should be described and assessed including guidelines for assessing the significance of impacts.

IAQM 'Guidance on the Assessment of Dust from Demolition and Construction'

Guidance on the assessment of dust from demolition and construction has been published by the IAQM[4]. The guidance provides a series of matrices to determine the risk magnitude of potential dust sources

[2] Defra Local Air Quality Management Technical Guidance (2016).
[3] Environmental Protection UK and Institute of Air Quality Management, 'Land-Use Planning and Development Control: Planning for Air Quality' (v1.2 2017).
[4] Institute of Air Quality Management (IAQM), Guidance on the assessment dust from demolition and construction (v1.1, 2016).

associated with construction activities in order to identify appropriate mitigation measures that are defined within further IAQM guidance.

IAQM 'Guidance on the Assessment of Mineral Dust for Planning'

The IAQM published the document 'Guidance on the Assessment of Mineral Dust Impacts for Planning' in June 2016. Designed specifically for the planning process, the guidance sets out a structured methodology for the assessment of impacts and consideration of their significance.

7.2.2 Assessment Methodology

7.2.2.1 Consultation

Pre-application discussion was undertaken with the Environment Health Department within WHC in order to agree upon the extent of the methodology of the air quality chapter. The scope of works was agreed by WHC on 12th September 2018[5].

7.2.2.2 Construction Dust Assessment

The assessment has been undertaken with reference to IAQM – Guidance on the Assessment of Dust from Demolition and Construction.

Descriptors for magnitude of impact and impact significance used in this assessment of construction phase dust are from the IAQM Guidance and reproduced in Appendix 7.1.

7.2.2.3 Vehicular Pollutants Assessment

The assessment has been undertaken with reference to the following documents:

- Local Air Quality Management Technical Guidance LAQM.TG(16);
- DMRB Volume 11, Section 3, Part 1 HA207/07 – Air Quality (an Interim Advice Note); and
- Land-Use Planning and Development Control: Planning for Air Quality (v1.2, 2017) – EPUK and IAQM.

Descriptors for magnitude of impact (percentage change in air quality relative to AQAL) and predicted impact used in this assessment are from the EPUK & IAQM Guidance, as presented in Table 7.3.

Table 7.3 : Operational Phase Impact Significance Matrix

Concentration with the Development	Percentage Change in Air Quality Relative to AQAL (%)			
	<1	1-5	5-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial

[5] Email conversation with Terry Vincent, Environmental Health Technical Officer within Welwyn Hatfield Council, and SLR Consulting Ltd, dated 12th September 2018.

Concentration with the Development	Percentage Change in Air Quality Relative to AQAL (%)			
	<1	1-5	5-10	>10
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Detailed air dispersion modelling has been undertaken using the Cambridge Environmental Research Consultants (CERC) ADMS Roads v4.1 air dispersion model, following guidance provided in LAQM.TG(16) to predict annual mean concentrations of NO_2 and PM_{10} for the various scenarios. The risk of exceedence of the short-term AQOs and compliance with 1-hour mean NO_2 and 24-hour mean PM_{10} AQOs has been assessed following LAQM.TG(16) guidance.

The following scenarios have been modelled:

- Verification / Baseline: 2017 baseline year, on the basis that this is the most recent year with complete datasets for traffic flow, diffusion tube monitoring data and meteorological data with which to carry out model verification, in accordance with LAQM.TG.(16);
- Do Minimum (DM): 2028 future opening year, inclusive of committed development flows; and
- Do Something (DS): 2028 opening year of the Proposed Development with associated traffic flows.

Details of the dispersion model set-up, traffic data and verification are provided in Appendix 7.2.

Air Quality Significance Criteria – Vehicular Pollutants Assessment

The EPUK-IAQM guidance requires a judgment on the significance of the 'effect', this is based upon consideration, as necessary, of the following factors:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts;
- the worst case assumptions adopted when undertaking the prediction of impacts; and
- the extent to which the Proposed Development has adopted best practice to eliminate and minimise emissions.

7.2.2.4 Operational Phase Dust

The proposed development is located in close proximity to two proposed sand and gravel quarries: to the south-west of the Application Site is the proposed Hatfield Quarry site (Hertfordshire County Council (HCC) application reference: PL\0755\16); and to the north of the Application Site is the proposed Furze Field, Hatfield Quarry extension (HCC application reference: 5/3720-16).

Potential impacts from fugitive dust emissions arising from these quarries, once operational, have been considered with reference to the IAQM document Guidance on the Assessment of Mineral Dust Impacts for Planning.

7.3 BASELINE CONDITIONS

7.3.1 Sensitive Receptors

7.3.1.1 Construction Phase Sensitive Receptors

The main receptors likely to be affected by the generation of construction dust are those existing receptors within approximately 350m of the development site boundary and/or within 50m of the route(s) used by vehicles on the public highway, up to 500m from the site entrance(s). However, for those receptors sited in a downwind location from the development site boundary, potential dust impacts may be witnessed at a distance of greater than 350m on occasion under worst case conditions.

Reference should be made to Figure 7.1 for an illustration of buffer zones of all sensitive receptors with the potential to be impacted upon by construction phase dust from the proposed development in accordance with the stated IAQM assessment methodology.

7.3.1.2 Traffic Emissions Assessment Sensitive Receptors

The DMRB method considers any receptor within 200m of a road source to be potentially affected by air quality. Human receptor locations have been characterised with reference to LAQM.TG(16) Box 1.1. According to LAQM.TG(16) exceedences of the AQOs should be assessed in relation to:

> *"the quality of the air at locations which are situated outside of buildings or other natural or man-made structure, above or below ground, and where members of the public are regularly present".*

The receptor locations considered representative of potential exposure within the Air Quality Assessment of road traffic emissions are shown below in Table 7.4, based upon relevant exposure locations outlined in Table 7.2. Receptors have been modelled at a height of 1.5m above ground level to represent exposure (i.e. breathing) height. Where traffic emission receptors are referenced within the report text, they are referred to as R1 – R34. The sensitive receptors identified in Table 7.4 represent worst-case locations and have been chosen as the closest residences to each road which may be affected by traffic associated with the development.

Reference should be made to Figure 7.2 for an illustration of the considered receptor locations relative to the wider area and modelled links.

Table 7.4 : Operational Phase – Human Road Traffic Emission Sensitive Receptors

ID	Receptor Description	NGR (m)	
		X	Y
R1	Popefield Farm - residential	520073.6	207963.9
R2	Residential property on A1057	520377.4	208077.2
R3	Residential property on Poplars Close	520746.1	208177.3
R4	Residential property on St Albans Road West	520777.9	208189.7
R5	Residential property on Ashbury Close	521163.8	208285
R6	University of Hertfordshire Sports Pitches - short-term exposure only	520409.1	207955.7

ID	Receptor Description	NGR (m)	
		X	Y
R7	Astwick Manor Lodge - residential	520498.9	210098
R8	Astwick Manor - residential	520442.3	209974.5
R9	Residential property on Selwyn Crescent	521231.5	208120
R10	Residential property on Crossbrook 1	521189.4	207912.8
R11	Residential property on Crossbrook 2	521154.1	207777.5
R12	Residential property off Ellenbrook Lane	521124.5	207665.7
R13	King George House - residential	521579.5	208678.5
R14	Residential property on Walsingham Close	521919.8	209077.6
R15	Residential property off Hatfield Avenue	521007.8	210034.5
R16	Residential property off Cornflower Way	521446.2	209768
R17	Residential property off Campion Road 1	521551.8	209698.3
R18	Residential property off Campion Road 2	521614	209663.8
R19	Residential property on West View 1	522093.8	209415.9
R20	Residential property on West View 2	522078.6	209392.4
R21	Residential property on West View 3	522080	209379.3
R22	Residential property off Birchwood Avenue	522074.5	209321.3
R23	Residential property off Wellfield Road	522070.4	209306.1
R24	Residential property on Halford Court 1	521197	208964.4
R25	Residential property on Halford Court 2	521183.8	208940.2
R26	Residential property off Errington Close 1	521092.7	208706.1
R27	Residential property off Errington Close 2	521085.1	208684
R28	Residential property on Albatross Way 1	521060.9	208669.5
R29	Residential property on Albatross Way 2	520952.5	208619.1
R30	Residential property on Albatross Way 3	520878.7	208583.2
R31	University of Hertfordshire - student accommodation off Albatross Way 1	521045.1	208619.8
R32	University of Hertfordshire - student accommodation off Albatross Way 2	520943.6	208570.8
R34	How Dell Primary School	521147.9	209092.8

7.3.1.3 Ecological Receptors

A review using the Magic web-based mapping service[6] was undertaken to identify any designated sites of ecological or nature conservation importance required for consideration within the assessment, as follows:

[6]Natural England, www.magic.gov.uk, accessed October 2018.

- construction phase assessment – any ecological designation within 50m of the Application Site boundary, or 50m of any road projected to witness construction phase road traffic movements, that could potentially be affected by dust from the construction phases of the proposed development; and
- operational phase assessment – any Ramsar, Special Areas of Conservation (SAC), Special Protection Areas (SPA) or Sites of Special Scientific Interest (SSSI) within 200m of any 'affected road' as part of the scheme, that could be affected by any change in vehicle emissions associated with the proposed development.

A search within 50m of the development boundary / any road projected to witness construction phase road traffic movements, and 200m of any 'affected road' surrounding the Application Site indicated no sensitive ecological receptors.

7.3.2 Baseline Air Quality

7.3.2.1 Local Authority Review and Assessment

As required under Section 82 of the Environment Act (1995) (Part IV), WHC has conducted an ongoing exercise to review and assess air quality within their area of administration. This process has indicated that concentrations of all Air Quality Strategy pollutants were below the relevant AQOs at locations of relevant public exposure, and as such no AQMAs have been declared within the Council's administrative area.

7.3.2.2 Automatic Air Quality Monitoring

The UK Automatic Urban and Rural Network (AURN) is a countrywide network of air quality monitoring stations operated on behalf of DEFRA. Monitoring data for AURN sites is available from the UK Air Information Resource website (UK AIR)[7].

The closest AURN monitor to the development site is the Borehamwood Meadow Park AURN (NGR: x519709, y197243), located approximately 11.5km south south-west of the Application Site. The Borehamwood Meadow Park AURN is classified as an '*urban background*' location, identified as "*an urban location distanced from sources and therefore broadly representative of city-wide background conditions, e.g. urban residential areas*". Due to the distance between the Application Site and the AURN location, similar pollutant concentrations are not anticipated and therefore the AURN site has not been considered within the context of this assessment.

At the time of assessment, WHC undertakes continuous air quality monitoring at 1No. location within the Council's area. This monitor is located at Great North Road / A1000 (NGR: x523293, y209171), located approximately 2.6km east of the Application Site. The Great North Road / A1000 automatic monitor is classified as a 'roadside' location, identified as "*a site sampling typically within one to five metres of the kerb of a busy road (although distance can be up to 15 m from the kerb in some cases)*". The Great North Road / A1000 automatic monitor is located within the centre of Hatfield, adjacent to the rail line, and only monitors annual mean $PM_{2.5}$ concentrations. Due to the difference in surroundings / classification between the Application Site and the Great North Road / A1000 automatic monitor location, similar pollutant concentrations are not anticipated and therefore data from the Great North Road / A1000

[7] DEFRA, UK Air Information Resource (UK-AIR) website, http://uk-air.defra.gov.uk/, accessed October 2018.

automatic monitor has not been considered within the context of this assessment.

7.3.2.3 Passive Diffusion Tube Monitoring

Passive diffusion tube monitoring is currently undertaken by WHC at a number of locations throughout the Council's area as part of their commitment to LAQM. The diffusion tubes are located in areas which are deemed to require further assessment of NO_2 concentrations.

A summary of recent NO_2 monitoring results is presented within Table 7.5. Exceedences of the annual mean AQO are highlighted in bold.

Table 7.5: WHC Passive Diffusion Tube Monitoring Results

Monitoring Location		Site Classification	NGR (m)		Annual Mean NO_2 Concentration ($\mu g/m^3$) (A,B)		
			X	Y	2015	2016	2017
WH7	Parkhouse Court, Hatfield	Near road	521575	521575	21	20	30
WH14	Green Lanes, Hatfield	Kerbside	522013	522013	21	23	28
WH19	Comet Way on A1001 & A1M	Background	522144	522144	30	30	**49**
WH22	Garden Village, Hatfield	Kerbside	521801	521801	39	22	**43**
WH24	Ellenbrook Lane @ A1001	Near road	521164	521164	- (C)	**43**	**40**
WH25	West View, Hatfield	Near road	522093	522093	- (C)	36	**46**
WH26	West View, Hatfield	Near road	522064	522064	- (C)	36	**39**
WH27	West View, Hatfield	Near road	522060	522060	- (C)	32	**40**

Notes:

(A) Bias corrected.

(B) Monitored concentrations only reported to 1sf.

(C) No monitoring undertaken during stated year.

The data indicates that the annual mean NO_2 AQO of $40\mu g/m^3$ has been exceeded at a number of diffusion tube monitoring locations during considered years. However, review of the WHC 2018 Air Quality Annual Status Report indicates that a number of the monitoring locations presented in Table Table 7.5 are not locations of relevant exposure to the annual mean AQO. Therefore, these monitored concentrations are not necessarily considered 'exceedences' in LAQM terms.

Further assessment is provided within the WHC 2018 Air Quality Annual Status Report to predict the associated annual mean NO_2 concentration at the location of relevant exposure for each of the diffusion tubes were monitored concentrations are $>40\mu g/m^3$. The results of this further review indicate a predicted exceedance of the NO_2 annual mean AQO at the relevant exposure to diffusion tube monitoring location

WH25. The WHC 2018 Air Quality Annual Status Report concludes that this exceedance / monitoring location and location of relevant exposure will be kept under review, and a continuous monitor is to be installed at this location to further understand monitored concentrations. To date, no AQMA was suggested to be declared covering this location. This commendation was supported by DEFRA.

7.3.2.4 DEFRA Mapped Background Concentrations

Background pollutant concentration data on a 1km x 1km spatial resolution is provided by DEFRA through the UK Air Information Resource (AIR) website and is routinely used to support LAQM and Air Quality Assessments.

Mapped background concentrations of NO_2 and PM_{10}, based upon the 2015 base year DEFRA update[8], were downloaded for the grid squares containing the development site and the Traffic Emissions Assessment Sensitive Receptors presented in Table 7.4.

A methodology is presented within LAQM.TG(16) to remove individual source sectors from the mapped background concentrations presented as part of the AIR, to present those source sectors which are to be explicitly modelled. This approach avoids double counting of potential source contributions i.e. from existing baseline traffic flows included within the detailed dispersion modelling assessment. However, as a precautionary approach no source sector removal / apportionment of background concentrations has been undertaken. This is considered to overestimate potential contributions from the roads considered as part of the dispersion modelling assessment.

Background pollutant concentrations, for 2015 (the mapping base year) and 2028 (the development opening year), are displayed in Table 7.6 and Table 7.7, respectively.

Table 7.6: 2015 Mapped Background Concentrations

Grid Square (NGR) (m)		NO_2 Annual Mean Concentration ($\mu g/m^3$)	PM_{10} Annual Mean Concentration ($\mu g/m^3$)
X	Y		
520500	210500	11.7	14.3
521500	210500	13.2	14.9
520500	209500	12.7	13.6
521500	209500	18.2	15.8
522500	209500	20.2	16.2
520500	208500	14.3	14.4
521500	208500	22.2	17.1
520500	207500	15.0	15.3
521500	207500	20.3	16.1

[8] Background mapping data for local authorities – http://uk-air.defra.gov.uk/data/laqm-background-home, accessed October 2018.

Table 7.7: 2028 Mapped Background Concentrations

Grid Square (NGR) (m)		NO_2 Annual Mean Concentration ($\mu g/m^3$)	PM_{10} Annual Mean Concentration ($\mu g/m^3$)
X	Y		
520500	210500	7.46	13.6
521500	210500	8.25	14.1
520500	209500	8.12	12.9
521500	209500	10.8	14.6
522500	209500	12.0	15.3
520500	208500	8.87	13.7
521500	208500	12.8	16.2
520500	207500	9.17	14.5
521500	207500	11.9	15.2

7.4 Assessment of Effects

7.4.1 Construction Effects

7.4.1.1 Construction Dust

Construction activities will include:

- material import and export;
- temporary stockpiling of materials;
- landscaping works;
- construction of new on-site facilities; and
- associated vehicle movements (including track-out of material by construction phase movements).

The following subsections provide a consideration of potential construction dust and conclude with a determined emission class and risk category, from each of the 4 categories identified by the IAQM Guidance.

Initial Screening

As shown in Figure 7.1, there are 'human receptors' within 20m of the Application Site, but no ecological receptors within 50m of the site boundary or within 50m of the site access roads (assessed up to 500m from the site entrance). Therefore, an assessment of construction dust on ecological receptors has been screened out from this assessment, but an assessment of construction dust at human receptors is required.

Potential Dust Emissions Magnitude

A summary of the dust emission magnitude for each phase is presented within Table 7.8.

Table 7.8: Construction Phase Assessment Summary – Dust Emission Magnitude

Activity		Dust Emission Magnitude
Demolition	The site is currently greenfield public open space land. No demolition of any buildings /structures is required.	n/a
Earthworks	Site earthworks are required over an area of >10,000m^2, with assumed clay soil types representing a high-risk potential for suspension when dry due to small particle size. Given the quantum of development, earthworks are highly likely to be required over a period of >12-months. For the purpose of this assessment and to provide a worst-case assumption, it has been assumed that earthworks associated with site preparation and landscaping would run concurrently with construction works. Due to the size of the site, >10-heavy earth moving vehicles may be required on site.	Large
Construction	The total building volume associated with the proposed development is predicted to be greater than 100,000m^3. Construction is anticipated to occur over a >1-year period. Construction method is considered to be of standard brick masonry, representing a high potential for dust generation. Concrete batching is considered unlikely given the availability of ready-mix concrete off-site. Piling considered unlikely to be required given the residential nature of the development site.	Large
Trackout (A)	Construction vehicles will access the Application Site via two entrances to the created off Albatross Way (to the south) and Coopers Green Lane (to the north). Given the scale and nature of works required, there are anticipated to be >50 HDV outward movements in a maximum worst-case day. Due to the size of the site the unpaved road length is considered to be greater than 100m	Large

Note:
(A) Trackout is defined as any dust emissions which are transported from the site to the surrounding area/local road network via construction vehicles travelling to and from the site.

Sensitivity of the Area

The sensitivity of the area takes account of 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 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.

The sensitivity of the area and the factors considered are presented in Table 7.9 and Figure 7.1.

Table 7.9: Sensitivity of the Area to Construction Dust Impacts

Sensitivity to	Comments	Sensitivity
Dust Soiling Impacts	The surroundings comprise residential properties that are classified as of high sensitivity to dust soiling. There are between 10 -1 00 high sensitivity receptors within 50m.	Medium
Human Health Impacts	The maximum considered 2015 DEFRA mapped background PM_{10} concentration presented within Table 7.6 is 17.1µg/m3 (i.e. falls into the <24µg/m3 class) and there are less between 10 - 100 receptors within 50m.	Low

Risk of Impact (Unmitigated)

The outcome of the assessment of the potential 'magnitude of dust emissions', and the 'sensitivity of the area' are combined in the table below to determine the risk of impact which is used to inform the selection of appropriate mitigation.

Table 7.10: Risk of Construction Phase Dust Impacts: Requirements for Site Specific Mitigation

Potential Impact	Demolition	Earthworks	Construction	Trackout
Dust Soiling Impacts	n/a	Medium Risk	Medium Risk	Medium Risk
Human Health Impacts	n/a	Low Risk	Low Risk	Low Risk

7.4.1.2 Construction Phase – Vehicular Pollutants

Road traffic emissions associated with vehicle movements, particularly HDV movements, during the construction phase of the development have the potential to result in increased concentrations of combustion related pollutants, such as NO_2 and PM_{10} in the vicinity of the development site.

Guidance[9] provided by EPUK & IAQM, states that a detailed assessment of potential air quality impacts should be undertaken if the following criteria are met on any link affected by a proposed development:

- change in 24-hour LDV flows of more than 100 annual average daily traffic (AADT) flow within or adjacent to an AQMA; or
- change in 24-hour HDV flows of more than 25 AADT within or adjacent to an AQMA.

Anticipated trip generation and vehicle movements during the construction phase of the proposed development (as both LDVs and HDVs) were provided by Vectos, transport consultants to the applicant. Reference should be made to Table 7.11 for 2-way vehicle movements anticipated during the construction phase of the scheme.

Table 7.11: Construction Phase Vehicle Movements

Link	Road Name	LDV	HDV
1	A1057	10	0
2	Coopers Green Lane (North of Hatfield Avenue)	23	0

[9] EPUK and IAQM, 'Land-Use Planning and Development Control: Planning for Air Quality', v1.2 2017.

Link	Road Name	LDV	HDV
3	Coopers Green Lane (South of Hatfield Avenue)	23	0
4	A1001 (South of Cavendish Way Roundabout)	13	30
5	A1001 SB (North of Cavendish Way Roundabout)	4	0
6	A1001 NB (North of Cavendish Way Roundabout)	4	0
7	Hatfield Avenue (between Coopers Green Lane and Frobisher Way)	24	0
8	A1(M) Northbound (J3-J4)	0	0
9	A1(M) Southbound (J4-J3)	0	0
10	Mosquito Way North of Albatross Way (between Albatross Way and Dragon Road)	18	0
11	Mosquito Way South of Albatross Way (between A1057 and Albatross Way)	29	30
12	Albatross Way	57	30

As indicated in Table 7.11, predicted vehicle movements during the construction phase of the proposed development are not anticipated to result in a significant increase in movements above the EPUK & IAQM indicative criterion for assessment. Therefore, in accordance with the criterion presented within EPUK and IAQM guidance, additional road vehicle trips during the construction phase of the scheme *'can be considered to have insignificant effects'* on air quality.

Notwithstanding, predicted construction phase vehicle movements has been added to the 'operational phase' 2028 development opening year scenario, in order to provide a cumulative assessment of road vehicle emissions associated with both the construction and operational phases to determine the overall impact and effect on air quality.

Reference should be made to Chapter 12 Transport, for further details on the transport assessment and traffic data considered for the scheme.

7.4.1.3 Construction Phase – Non-road Mobile Machinery

NRMM refers to mobile machines, transportable industrial equipment or vehicles which are fitted with an internal combustion engine and not intended for transporting goods or passengers on roads.

Pollutants emitted by NRMM that may have the most significant potential effects on local air quality are particulate matter (PM_{10} and $PM_{2.5}$), and NOx/NO_2. Typically NRMM is associated with construction sites and, therefore there is a potential for NRMM emissions to adversely affect local air quality as a result of the proposed development.

However, LAQM.TG(16) guidance states that[10], with the application of suitable control measures and site management, exhaust emissions from on-site NRMM are "*unlikely to make a significant impact on local air quality. In the vast majority of cases they will not need to be quantitatively assessed*". As such, the impacts and effects on air quality from on-site NRMM are considered to be not significant.

[10] *Local Air Quality Management Technical Guidance* LAQM.TG(16), DEFRA, April 2016. Page 7-9.

7.4.2 Operational Phase Effects

Operational Phase Mineral Dust

The proposed development is located in the vicinity of two proposed sand and gravel quarries: the Hatfield Quarry site, and the Furze Field, Hatfield Quarry extension.

Whilst these quarries have yet to commence operation, they have the potential to result in a development constraint due to impacts from operational mineral dust. The IAQM document Guidance on the Assessment of Mineral Dust Impacts for Planning states the following regarding the impact of dust emissions arising from mineral sites:

> *"dust impacts will occur mainly within 400 m of the operation, even at the dustiest of sites […] adverse dust impacts from sand and gravel sites are uncommon beyond 250 m and beyond 400 m from hard rock quarries measured from the nearest dust generating activities […] In cases whereby receptors are located between 400 m, or 250 m (depending on the rock type) and 1km of operations, it would normally be assumed that a detailed disamenity dust impact assessment is not required."*

In relation to the Hatfield Quarry site located to the south-west of the Application Site (HCC application reference: PL\0755\16) at the closest point, residential parcels of the proposed development site are located >250m to the north-east of the site boundary of the proposed Hatfield Quarry. Furthermore, a review of the plans submitted to support the application for the Hatfield Quarry site indicate that lagoons are proposed to be located on the north-eastern boundary of the Hatfield Quarry site. These lagoons are not active working areas and will not be associated with the generation of potential mineral dust.

As such, potential operational phase dust impacts at the proposed development site can be screened out of this assessment and have not been considered further. In accordance with the stated IAQM minerals guidance, the risk of impact at the proposed development site is likely to be 'negligible' and any resulting effects are likely to be 'not significant'.

In relation to the Furze Field, Hatfield Quarry extension located to the north of the Application Site (HCC application reference: 5/3720-16), at the closest point, residential parcels of the proposed development site are located within 250m of the site boundary of the proposed extraction margin. A Dust Impact Assessment was submitted in support of the planning application for the proposed Furze Field, Hatfield Quarry extension. This assessment included a consideration of potential mineral dust effects arising during the operation of the proposed Furze Field, Hatfield Quarry extension on existing surrounding receptors. Three receptors were considered as part of the Furze Field, Hatfield Quarry extension Dust Impact Assessment which are representative of the proposed residential dwellings on the Application Site – these are Astwick Manor, Astwick Manor Lodge and Astwick Manor Cottages. The Dust Impact Assessment determined a 'slight adverse' impact from mineral dust at these existing receptors. Given the representative nature of these considered receptors to the Application Site, it is considered that for receptor locations part of the Application Site and located within 250m of the Furze Field, Hatfield Quarry extension extraction margin area are likely to witness a 'slight adverse' impact from mineral dust. In accordance with the stated IAQM minerals guidance, the predicted impact is considered to be a 'not significant' effect on air quality. Beyond, 250m the risk of impact at the proposed development site is likely to be 'negligible' and any resulting effects are likely to be 'not significant'.

To ensure that mineral dust effects are controlled, a number of mitigation measures are proposed including the construction of bunds along the southern boundary of the proposed Furze Field, Hatfield Quarry extension. Furthermore, wider mitigation measures required as part of planning conditions 12 and 36 of permission for HCC application reference: 6/1509-13 are referenced for wider application at the Furze Field, Hatfield Quarry extension.

7.4.2.1 Traffic Emissions Assessment

This section presents the potential air quality impacts arising from road traffic vehicle emissions associated with the operational phase of the proposed development in the 2028 complete development opening year scenario. In summary, the assessment has utilised the following inputs:

- 2028 emission factors from v8.0.1 of the EFT; and
- 2028 mapped background concentrations sourced from the DEFRA mapping study.

Reference should be made to Appendix 7.2 for details of the model inputs / model output treatments to the dispersion modelling assessment.

Reference should be made to Appendix 7.3 for presentation of impacts predicted as part of the 2015 precautionary modeling scenario. Modelling sensitivities have only under been undertaken on annual mean NO_2 concentrations.

Nitrogen Dioxide Annual Mean Modelling Results

Predicted annual mean ground level NO_2 concentrations were assessed against the AQO of 40µg/m^3, as displayed in Table 7.12. Exceedences of the AQO are highlighted in bold.

For completeness, predicted annual mean concentrations are additionally presented at NO_2 air quality monitoring locations within the development locale and the dispersion modelling domain (i.e. monitoring locations WH7, WH19, WH22, WH25 and WH26).

Table 7.12: Summary of Predicted Annual Mean NO_2 Concentrations: Road Vehicle Emissions: 2028 Development Opening Year

Receptor	2028 (µg/m^3) [A]		Change (µg/m^3)	Change as a Percentage of the AQO (%)	Impact
	'Do-minimum'	'Do-something'			
R1 [A]	12.0	12.0	+0.04	0.10	Negligible
R2 [B]	12.6	12.7	+0.06	0.15	Negligible
R3 [B]	12.0	12.1	+0.07	0.18	Negligible
R4 [B]	13.6	13.7	+0.11	0.28	Negligible
R5 [C]	18.2	18.6	+0.36	0.90	Negligible
R6 [A]	9.9	9.9	+0.02	0.05	-
R7 [D]	10.8	11.0	+0.16	0.40	Negligible
R8 [E]	8.5	8.5	+0.02	0.05	Negligible
R9 [C]	15.5	15.7	+0.13	0.33	Negligible
R10 [F]	15.3	15.4	+0.15	0.38	Negligible

Receptor	2028 (µg/m³) (A)		Change (µg/m³)	Change as a Percentage of the AQO (%)	Impact
	'Do-minimum'	'Do-something'			
R11 (F)	14.7	14.9	+0.12	0.30	Negligible
R12 (F)	14.4	14.5	+0.11	0.27	Negligible
R13 (C)	15.8	15.9	+0.06	0.15	Negligible
R14 (G)	14.7	14.8	+0.05	0.12	Negligible
R15 (H)	11.4	11.6	+0.23	0.57	Negligible
R16 (G)	13.1	13.2	+0.13	0.32	Negligible
R17 (G)	14.5	14.7	+0.21	0.52	Negligible
R18 (G)	14.6	14.8	+0.21	0.53	Negligible
R19 (I)	20.5	20.6	+0.12	0.30	Negligible
R20 (I)	22.4	22.6	+0.20	0.50	Negligible
R21 (I)	20.4	20.6	+0.21	0.53	Negligible
R22 (I)	16.8	17.0	+0.18	0.45	Negligible
R23 (I)	16.3	16.5	+0.16	0.40	Negligible
R24 (C)	15.5	15.7	+0.14	0.35	Negligible
R25 (C)	15.5	15.6	+0.15	0.38	Negligible
R26 (C)	15.7	16.3	+0.63	1.58	Negligible
R27 (C)	15.7	16.8	+1.10	2.75	Negligible
R28 (C)	15.0	16.0	+1.01	2.53	Negligible
R29 (B)	10.3	11.1	+0.75	1.88	Negligible
R30 (B)	10.2	10.9	+0.72	1.80	Negligible
R31 (C)	14.4	14.9	+0.54	1.35	Negligible
R32 (B)	10.1	10.7	+0.53	1.33	Negligible
R34 (G)	11.6	11.7	+0.05	0.13	Negligible
WH19 (I)	22.9	22.9	+0.05	0.13	-
WH22 (G)	21.0	21.5	+0.51	1.28	-
WH25 (I)	27.1	27.2	+0.12	0.30	-
WH26 (I)	21.4	21.8	+0.42	1.05	-
WH7 (C)	22.5	22.6	+0.10	0.25	-

Note:
(A) Scenario modelled with 2028 emission factors and 2028 mapped background pollutant concentrations.
(B) Annual mean concentrations inclusive of background concentration of 9.17µg/m³.
(C) Annual mean concentrations inclusive of background concentration of 8.87µg/m³.
(D) Annual mean concentrations inclusive of background concentration of 12.8µg/m³.
(E) Annual mean concentrations inclusive of background concentration of 7.46µg/m³.
(F) Annual mean concentrations inclusive of background concentration of 8.12µg/m³.
(G) Annual mean concentrations inclusive of background concentration of 11.9µg/m³.

Receptor	2028 (µg/m³) [A]		Change (µg/m³)	Change as a Percentage of the AQO (%)	Impact
	'Do-minimum'	'Do-something'			
(H) Annual mean concentrations inclusive of background concentration of 10.8µg/m³.					
(I) Annual mean concentrations inclusive of background concentration of 12.0µg/m³.					
- Receptor / Diffusion tube monitoring location is not relevant exposure to the annual mean AQO. Therefore, no impact descriptor presented.					

As shown in Table 7.12, there are no predicted exceedences of the annual mean AQO in either scenario during the 2028 development opening assessment year.

The predicted percentage change of annual mean NO_2 concentrations ranges from between 1 – 5% of the AQO (receptor locations R26 – R34) to <1% of the AQO (receptor locations R1 – R25). An unmitigated negligible impact is therefore predicted at all receptor locations in accordance with the assessment methodology.

Nitrogen Dioxide 1-hour Mean Modelling Results

The risk of exceeding the 1-hour mean AQO was assessed according to the guidance in LAQM.TG(16). This Guidance states that:

> *"authorities may assume that exceedences of the 1-hour mean objective for NO_2 are only likely to occur where annual mean concentrations are 60 µg/m³ or above".*

The maximum annual mean NO_2 'do-something' concentration is 18.6µg/m³ (predicted at R5). Whilst this location is not comparable to relevant exposure to the 1-hour mean NO_2 AQO, in accordance with DEFRA guidance the maximum predicted annual mean NO_2 concentration indicates that exceedences of the 1-hour mean NO_2 AQO are considered 'unlikely' at existing receptors as a result of proposed development trips.

Particulate Matter Annual Mean Modelling Results

Predicted annual mean ground level PM_{10} concentrations were assessed against the $PM_{2.5}$ AQO of 25µg/m³, in accordance with EPUK and IAQM guidance, as displayed in Table 7.13. Exceedences of the annual mean $PM_{2.5}$ AQO are highlighted in bold.

Table 7.13: Summary of Predicted Annual Mean PM_{10} Concentrations: Road Vehicle Emissions: 2028 Development Opening Year

Receptor	2028 (µg/m³) [A]		Change (µg/m³)	Change as a Percentage of the AQO (%)	Impact
	'Do-minimum'	'Do-something'			
R1 [A]	16.5	16.5	+0.02	0.08	Negligible
R2 [B]	16.9	17.0	+0.03	0.12	Negligible
R3 [B]	16.5	16.6	+0.03	0.12	Negligible
R4 [B]	16.9	16.9	+0.04	0.16	Negligible
R5 [C]	17.6	17.7	+0.15	0.60	Negligible
R6 [A]	15.6	15.6	+0.01	0.04	-

Receptor	2028 (µg/m³) [A]		Change (µg/m³)	Change as a Percentage of the AQO (%)	Impact
	'Do-minimum'	'Do-something'			
R7 [D]	16.5	16.5	+0.05	0.20	Negligible
R8 [E]	15.4	15.4	+0.01	0.04	Negligible
R9 [C]	16.6	16.7	+0.06	0.24	Negligible
R10 [F]	17.0	17.1	+0.05	0.20	Negligible
R11 [F]	16.7	16.8	+0.05	0.20	Negligible
R12 [F]	16.5	16.6	+0.05	0.20	Negligible
R13 [C]	16.8	16.8	+0.02	0.08	Negligible
R14 [G]	17.2	17.2	+0.05	0.20	Negligible
R15 [H]	16.3	16.3	+0.07	0.28	Negligible
R16 [G]	16.1	16.2	+0.05	0.20	Negligible
R17 [G]	16.5	16.6	+0.07	0.28	Negligible
R18 [G]	16.5	16.6	+0.06	0.24	Negligible
R19 [I]	18.3	18.4	+0.06	0.24	Negligible
R20 [I]	19.1	19.2	+0.09	0.36	Negligible
R21 [I]	18.5	18.5	+0.09	0.36	Negligible
R22 [I]	17.3	17.4	+0.07	0.28	Negligible
R23 [I]	17.1	17.2	+0.07	0.28	Negligible
R24 [C]	16.3	16.3	+0.05	0.20	Negligible
R25 [C]	16.3	16.4	+0.05	0.20	Negligible
R26 [C]	16.3	16.5	+0.21	0.84	Negligible
R27 [C]	16.3	16.7	+0.36	1.44	Negligible
R28 [C]	16.1	16.5	+0.37	1.48	Negligible
R29 [B]	15.9	16.2	+0.29	1.16	Negligible
R30 [B]	15.8	16.1	+0.29	1.16	Negligible
R31 [C]	15.9	16.1	+0.21	0.84	Negligible
R32 [B]	15.8	16.0	+0.21	0.84	Negligible
R34 [G]	15.6	15.6	+0.02	0.08	Negligible

Note:

(A) Scenario modelled with 2028 emission factors and 2028 mapped background pollutant concentrations.

(B) Annual mean concentrations inclusive of background concentration of 14.5µg/m³.

(C) Annual mean concentrations inclusive of background concentration of 13.7µg/m³.

(D) Annual mean concentrations inclusive of background concentration of 16.2µg/m³.

(E) Annual mean concentrations inclusive of background concentration of 13.6µg/m³.

(F) Annual mean concentrations inclusive of background concentration of 12.9µg/m³.

(G) Annual mean concentrations inclusive of background concentration of 15.2µg/m³.

(H) Annual mean concentrations inclusive of background concentration of 14.6µg/m³.

Receptor	2028 (µg/m³) [A]		Change (µg/m³)	Change as a Percentage of the AQO (%)	Impact
	'Do-minimum'	'Do-something'			
(I) Annual mean concentrations inclusive of background concentration of 15.3µg/m³.					
- Receptor location is not relevant exposure to the annual mean AQO. Therefore, no impact descriptor presented.					

As shown in Table 7.13, there are no predicted exceedences of the annual mean $PM_{2.5}$ AQO in either scenario during the 2028 development opening assessment year.

The predicted percentage change of annual mean PM_{10} concentrations ranges from between 1 – 5% of the $PM_{2.5}$ AQO (receptor locations R27 – R30) to <1% of the $PM_{2.5}$AQO (receptor locations R1 – R26 and R31 – R34). An unmitigated negligible impact is therefore predicted at all receptor locations in accordance with the assessment methodology.

Particulate Matter 24-hour Mean Modelling Results

The risk of exceeding the 24-hour mean AQO was assessed according to the guidance in LAQM.TG(16). This Guidance provides the calculation below to determine compliance;

$$\text{No. 24-hour mean exceedances} = -18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean})$$

The maximum predicted annual mean PM_{10} concentration of 19.2µg/m³, as predicted at receptor location R20. Whilst this location is not comparable to relevant exposure to the 24-hour mean PM_{10} AQO, in accordance with DEFRA guidance this equates to 2-days where 24-hour mean PM_{10} concentrations are greater than 50µg/m³ (35 24-hour mean concentrations in excess of 50µg/m³ are permitted). Therefore, the number of exceedences is in compliance with the 24-hour mean AQO.

7.4.2.2 Significance of Air Quality Impacts

In relation to the proposed scheme, the unmitigated impact significance associated with the scheme has been predicted in accordance with the stated assessment methodology. The following factors have been taken into account in assessing significance of effects:

- existing receptors:
  - there are no new predicted exceedences of the annual mean NO_2 or PM_{10} (or $PM_{2.5}$) AQOs as a result of the development as part of the 2028 development opening year scenario. The 2015 assessment sensitivity scenario presented in Appendix 7.3 predicts a number of exceedences of the annual mean NO_2 AQO: however, these do not occur as a result of change in development trips associated with the operation of the proposed development;
  - a negligible impact on annual mean NO_2 concentrations has been predicted at all considered receptor locations as part of the 2028 development opening year scenario;
  - a negligible impact on annual mean PM_{10} concentrations has been predicted at all considered receptor locations, even with change in concentrations as a result of the development assessed against the more exacting $PM_{2.5}$ AQO;
  - new exceedences of the 1-hour mean NO_2 AQO are considered unlikely based upon the marginal change in concentrations;
  - exceedences of the 24-hour mean PM_{10} AQO are considered unlikely, based upon the marginal change in concentrations and absolute concentrations predicted through the dispersion modelling study;

- modelling assumptions:
    - all modelled concentrations have been verified against WHC monitoring data.

7.4.3 Cumulative Effects

Cumulative effects on air quality resulting from construction dust and traffic emissions were undertaken and considered all required committed developments.

7.4.3.1 Construction Dust

There is the potential for committed developments in the vicinity of the development site which also have the potential to generate fugitive dust emissions during construction. However, the timings, planned phasing and durations of the construction phases of these developments are not known. It is therefore not possible to determine whether there is the likelihood of concurrent or sequential fugitive dust generation in the area. However, it noted that other developments in the area will also be required to implement good-practice mitigation and dust control measures and as such, the risk of concurrent dust generation is considered to be not significant.

7.4.3.2 Traffic Emissions

Additional traffic flows from nearby consented developments have been included within the traffic data used within the dispersion modelling scenarios, through the use of standard TEMPro growth factors as agreed with the highways authority. Reference should be made to Chapter 12 Transport for further details. As such, the cumulative effects of nearby consented schemes has been taken into consideration during this assessment in terms of traffic emissions.

7.5 MITIGATION

7.5.1 Construction Dust Phase

An assessment of the significance of impacts associated with construction phase dust has been undertaken in accordance with the IAQM methodology. A summary of the risk category associated with each identified source of construction phase dust is presented within Table 7.10, for the purposes of identifying mitigation requirements.

The risk of dust soiling effects is assessed as medium from earthworks, construction and trackout activities. The risk of human health effects from PM_{10} is assessed as low from earthworks, construction activities and trackout activities. No demolition is required prior to proceeding with site works and therefore this element of the assessment was screened out from further assessment in terms of identifying an associated risk and requirements for mitigation.

In order to control potential impacts, the mitigation measures presented within Table 7.14 are proposed for the scheme. These mitigation measures should be secured by planning condition.

Table 7.14: Construction Dust Mitigation Measures

Output Parameter	Mitigation Measures
Communications	Develop and implement a stakeholder communications plan that includes community engagement

Output Parameter	Mitigation Measures
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary
	Display the head or regional office contact information
	Develop and implement a Dust Management Plan (DMP) which may include measures to control other emissions, approved by the Local Authority
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken
	Make the complaints log available to the local authority when asked
	Record any exceptional incidents that cause dust and / or air quality emissions, either on- or off-site, and the action taken to resolve the situation in the log book
Monitoring	Carry out regular site inspections to monitor compliance with the Dust Management Plan, record inspection results, and make the log book 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
Preparing and Maintaining the Site	Plan site layout so machinery is located away from receptors as far as possible
	Erect solid barriers around dusty activities or the site boundary
	Fully enclose site or specific operations where there is a high potential for dust production
	Avoid site runoff of water or mud
	Keep fencing, barriers and scaffolding clean using wet methods
	Remove materials that have the potential to produce dust from site as soon as possible
	Cover, seed or fence stockpiles to prevent wind whipping
Operating Vehicle / machinery and sustainable travel	Ensure all on-road vehicles comply with the requirements of NRMM standards
	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
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction
	Ensure an adequate water supply on the site for effective dust / particulate matter suppression / mitigation
	Use enclosed chutes and conveyors and covered skips
	Minimise drop heights
	Ensure equipment is readily available on site to clean any dry spillages
Waste Management	Avoid bonfires and burning of waste materials
Earthworks & Construction	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out

Potential dust effects during the construction phase considered to be temporary in nature. The impacts are determined to be temporary as they will only potentially occur throughout the construction phase and short-term because these will only arise at particular times when certain activities and meteorological conditions for creating the level of magnitude predicted combine.

However, the application of the above dust control and mitigation measures, it is considered that impacts at all receptors will be 'not significant' in accordance with the IAQM guidance.

7.5.2 Construction Phase Road Traffic Emissions

Potential air quality impacts associated with construction phase road traffic emissions (principally HDV movements) have been screened out for further assessment with associated impacts on air quality predicted to result in an 'insignificant' effect. Therefore, mitigation measures are not considered to be required.

7.5.3 Construction Phase NRMM Emissions

LAQM.TG(16) guidance states that with the application of suitable control measures and site management, exhaust emissions from on-site NRMM are *"unlikely to make a significant impact on local air quality. In the vast majority of cases they will not need to be quantitatively assessed"*.

However, NRMM and plant should be well maintained. If any emissions of dark smoke occur then the relevant machinery should stop immediately and any problem rectified. In addition, the following controls should apply to NRMM:

- all NRMM should use fuel equivalent to ultralow sulphur diesel;
- all NRMM should comply with either the current or previous EU Directive Staged Emission Standards;
- all NRMM should be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting);
- the on-going conformity of plant retrofitted with DPF, to a defined performance standard; and
- implementation of fuel conservation measures including instructions to throttle down or switch off idle construction equipment; switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded, ensure equipment is properly maintained to ensure efficient fuel consumption.

Successful implementation of the above mitigation measures, which should be secured by planning condition, would ensure that emissions from the construction phase and NRMM used during construction are 'not significant'.

7.5.4 Operational Phase Emissions

An assessment of vehicle emissions associated with the operation of the scheme predicted the unmitigated impact to be negligible at all considered receptors resulting in an overall 'not significant' effect on air quality.

Notwithstanding, a Travel Plan is being prepared for the residential and school uses proposed. The Travel Plans for the development states the following mitigation measures which would help to improve air quality in the development locale, to be secured by planning condition. These include:

- Residential travel plan:
    - Appointment of a travel plan coordinator to oversee successful implementation of the Travel Plan;
    - Provision of residential travel packs which include information on public transport, including bus discount vouchers;
    - Provision of a new pedestrian access point to encourage walking;
    - Encouragement of car sharing; and
    - Cycling parking to be provided for each household, with cycle routes displayed to encourage cycling.
- School travel plan:
    - Appointment of a travel plan coordinator to oversee successful implementation of the Travel Plan;
    - Parental engagement to encourage parents to travel to the school by sustainable transport modes;
    - Encouragement of car sharing; and
    - Cycling parking to be provided on-site for staff and pupils;
    - Cycling training to be provided to increase the uptake and use of cycling; and
    - Information provided to staff and pupils / parents on public transport options.

7.6 RESIDUAL EFFECTS

7.6.1 Construction Phase

On the basis that the mitigation measures outlined in Section 7.5.1 are implemented, the residual effects from all construction phase activities are predicted to be not significant.

7.6.2 Operational Phase

7.6.2.1 Traffic Emissions Assessment

The predicted residual effects of traffic emissions arising from the scheme on existing sensitive receptors are predicted to be not significant without the inclusion of mitigation measures.

7.7 SUMMARY OF EFFECTS

Assuming the implementation of relevant mitigation measures, the overall effect of the development in terms of existing sensitive receptors surrounding the Application Site is predicted to be not significant.

7.8 CONCLUSIONS

SLR Consulting has undertaken an Air Quality Assessment to support the planning for a proposed mixed use development on land west of Hatfield.

A qualitative assessment of the potential dust impacts during the construction of the development has been undertaken. Through good practice and implementation of appropriate mitigation measures, it is expected that the release of dust would be effectively controlled and mitigated, with resulting impacts

considered to be 'not significant'. All dust impacts are considered to be temporary and short-term in nature.

Due to the low additional number of HDV trips anticipated during the construction phase of the development, there is predicted to be a neutral impact / insignificant effect on air quality from road vehicle emissions. Furthermore, emissions from plant / NRMM on-site is predicted to result in a 'not significant' impact on air quality.

Potential operational phase dust mineral dust impacts from the adjacent proposed Hatfield Quarry site are predicted to result in a 'negligible' risk of impact and 'not significant' effect on disamenity in accordance with the IAQM minerals guidance.

Potential operational phase dust mineral dust impacts from the adjacent proposed Furze Field Hatfield Quarry extension site are predicted to result in a 'slight adverse' impact and 'not significant' effect on disamenity for receptor locations of the Application Site located within 250m of the boundary of the proposed Furze Field Hatfield Quarry extension site. Beyond 250m, potential operational phase dust mineral dust impacts from the adjacent proposed Furze Field Hatfield Quarry extension site are predicted to result in a 'negligible' risk of impact and 'not significant' effect on disamenity in accordance with the IAQM minerals guidance.

Additional development trips arising during the operational phase of the scheme are predicted to result in a negligible impact on annual mean NO_2 and PM_{10} concentrations at all human receptor locations. There is no new predicted risk of exceedence of the 1-hour mean NO_2 or 24-hour mean PM_{10} AQOs as a result of the development proposals. As such, the overall effect is considered to be 'not significant'.

As such, it is not considered that air quality represents a material constraint to the development proposals, which conform to the principles of National Planning Policy Framework and accompany Planning Practice Guidance, the Hertfordshire Health and Wellbeing Planning Guidance and saved policies of the Welwyn Hatfield District Plan.