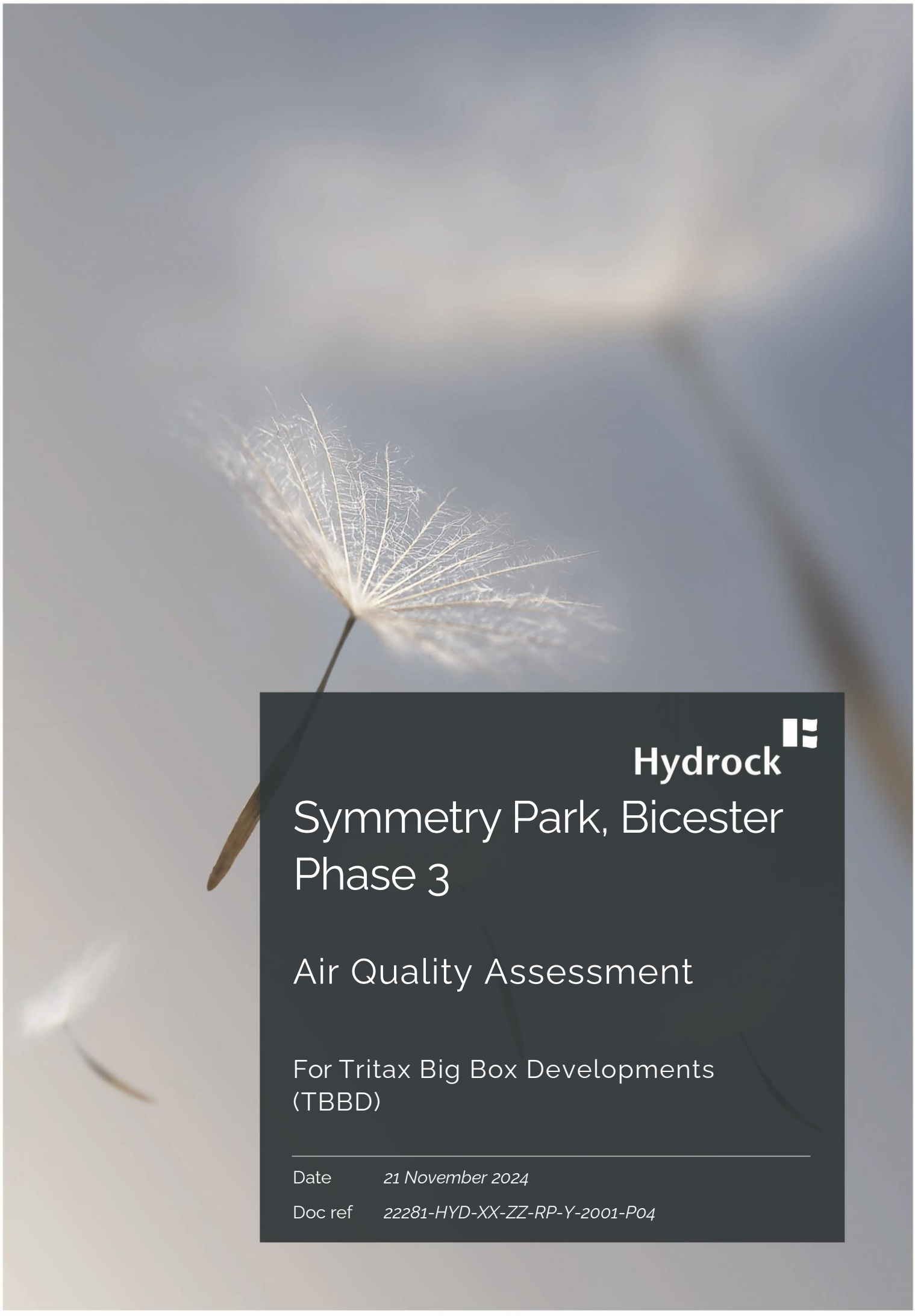

Hydrock

Symmetry Park, Bicester Phase 3

Air Quality Assessment

For Tritax Big Box Developments (TBBD)

Date	*21 November 2024*
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1. Introduction

1.1 Overview

Hydrock, now Stantec have been commissioned by Tritax Big Box Developments (TBBD) (the 'client') to prepare an Air Quality Assessment (AQA) for a site known as Symmetry Park, Bicester Phase 3. This AQA supports a new full planning application for 2 separate units, Unit E & Unit F.

The Site is within the administrative boundary of Cherwell District Council (CDC) and is centred on the National Grid Reference (NGR); x460647, y220636, as shown in Figure 1.

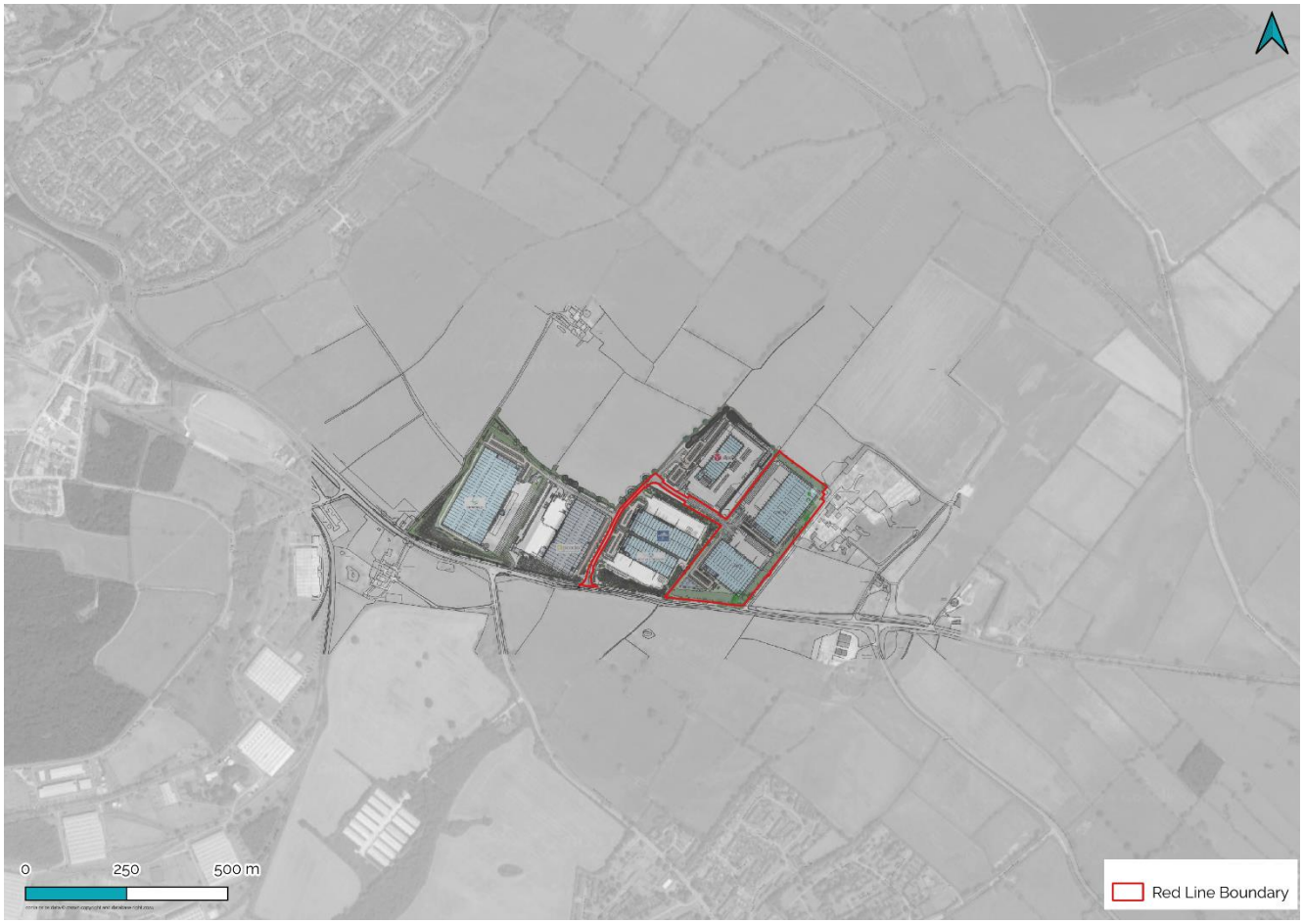

Figure 1: Site Location

The Site is located to the south-east of Bicester, approximately 3.5km to the south east of the town centre. The A41 provides direct access to the A34/M40 Junction 9 via the south of Bicester, which continues to link to the M25, and also the M42 south of Birmingham.

The Site currently comprises two larger and one smaller agricultural field with a disused barn area to the north-east. The Site is located between the existing Symmetry Park development (Bentley Designs and Medline Services immediately west and DPD to the north-west), and an existing industrial estate to the north-east comprising a caravan dealer, metal recycling and car breakers yard and field in the south-east.

1.2 Planning Context

Symmetry Park, Bicester was granted outline planning permission in 2016 (16/00861/HYBRID) for B8 uses. A summary of the relevant planning history is set out in the accompanying Planning Statement.

The majority of the existing Symmetry Park site (which the Site is immediately adjacent to) is located in an area allocated for development in the adopted Cherwell Local Plan 2011-2031, as a strategic allocation for employment development: Planning Policy Bicester 12: South East Bicester.

The Site is also identified in the Cherwell Local Plan Review 2042 (Regulation 19) Proposed Submission Plan, which was published on 4th November 2024, and is due to go out for public consultation in December 2024. The site is identified as an employment site allocation as an extension to the successful Symmetry Park Phase 1 and 2. The allocation is for employment uses (E(g)(i) (ii)/(iii)/B2/B8 (Policy Reference BIC 5).

1.3 Proposed Development

The Proposed Development consists of the construction of two units and associated infrastructure on the land adjacent to Symmetry Park, Bicester Phases 1 and 2. The total floor area proposed consists of 25,856 m^2 of logistics floor space (Use Class B8), with ancillary office space (Use Class E (g)(i)), together with associated site infrastructure including: lorry parking; landscaping; and, sustainable drainage, and access.

The key features of the Proposed Development are:

- Provision of employment land;
- Opportunity to attract new investment and job creation into Cherwell;
- Contribution towards the economic growth sought by Cherwell;
- Training and apprenticeship opportunities;
- Generation of Business Rates;
- Wide spectrum of job opportunities;
- Accessibility by a variety of modes of transport: pedestrian, cycle, public transport; and
- The provision of a high-quality landscaped environment: ecology and amenity value.

1.4 Purpose of Air Quality Assessment

The purpose of this assessment is to provide:

- Review of baseline air quality to assess the risk of exceedance of Air Quality Assessment Levels (AQALs) at the Site and surrounding area;
- Construction phase assessment to conclude on the requirements for mitigation to reduce the risk of impacts to negligible during this phase, and
- Consideration of potential impacts during the operational phase.

2. Relevant Legislation and Policy

2.1 Air Quality Regulations and Objectives

There are two sets of air quality legislation which include ambient air quality thresholds for the protection of public health that apply in England, these include legally binding limit values originally set by the European Union (EU) Directive 2008/50/EC[1] on ambient air quality and cleaner air for Europe; and regulations implementing national air quality objectives as set out in the revised 2023 Air Quality Strategy for England (AQS)[2] which local authorities are required to work towards achieving. In Northern Ireland and Scotland, the AQS (Volume 1)[3] remains in force.

The EU (Withdrawal Agreement) Act 2020 sets out arrangement for implementing air quality limit values that are included in the EU Directive on ambient air quality and cleaner air for Europe (2008/50/EC) included in the following:

- Air Quality Regulations (SI 2010 No.1001)[4] and amended (SI 2016 No.1184)[5] ;
- The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (SI 2019 74)[6] ;
- The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (SI 2020 1313)[7] amend the Air Quality Regulations (SI 2010 No.1001) to account for EU withdrawal; and
- The AQS objectives are implemented in the Air Quality (England) Regulations 2000 (SI 2000/928)[8] and Air Quality (England) (Amendment) Regulations 2002 (SI 2002/3043)[9].

The 2023 AQS sets out the government's policies and framework for improving air quality in England with the aim of meeting the requirements of above legislation. The Air Quality Strategy also outlines the Limit Values, Target Values, Standards, Objectives, Critical Levels and Exposure Reduction Targets for the protection of human health and the environment (collectively termed AQALs throughout this report). The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[10] also brought forward a new target level for $PM_{2.5}$. Those relevant to this assessment is provided below, in Table 1.

Table 1: National AQALs

Pollutant	Averaging Period	AQALs	
NO_2	1 Hour Mean	200µg/m^3	Not to be exceeded more than 18 times in a year.
	Annual Mean	40µg/m^3	
PM_{10}	24 Hour Mean	50µg/m^3	Not to be exceeded more than 35 times in a year.

1 Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe Available at: https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32008L0050

2 Defra. "The Air Quality Strategy for England, Scotland, Wales and Northern Ireland". Available at: https://www.gov.uk/government/publications/the-air-quality-strategy-for-england

3 The air quality strategy for England, Scotland, Wales and Northern Ireland: Volume 1, Available at: https://www.gov.uk/government/publications/the-air-quality-strategy-for-england-scotland-wales-and-northern-ireland-volume-1

4 The National Archives. "The Air Quality Standards Regulations 2010". Available at: http://www.legislation.gov.uk/uksi/2010/1001/contents/made

5 The National Archives (2016). "The Air Quality Standards (Amendment) Regulations 2016". Available at: https://www.legislation.gov.uk/uksi/2016/1184/contents/made

6 The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (legislation.gov.uk). Available at: https://www.legislation.gov.uk/uksi/2019/74/contents/made

7 The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (legislation.gov.uk). Available at: https://www.legislation.gov.uk/uksi/2020/1313/contents/made

8 The National Archives. "The Air Quality (England) Regulations 2000". Available at: http://www.legislation.gov.uk/uksi/2000/928/contents/made

9 The National Archives. "The Air Quality (England) (Amended) Regulations 2002". Available at: http://www.legislation.gov.uk/uksi/2002/3043/contents

10 https://www.legislation.gov.uk/uksi/2023/96/contents/made

Pollutant	Averaging Period	AQALs	
$PM_{2.5}$	Annual Mean	40µg/m^3	
	Annual Mean	20µg/m^3	
	Annual Mean Concentration Target (AMCT)	10µg/m^3	To be met across England by 2040
	-	Population Exposure Reduction Target ('exposure target')	35% reduction in population exposure by 2040 (compared to a base year of 2018).

Defra's Local Air Quality Management Technical Guidance 2022 (LAQM.TG (22))[11] provides guidance on where the above AQAL's should apply. This is summarised below, in Table 2.

Table 2: Summary of where AQALs should apply

Averaging Period	Objectives should apply at:	Objectives should generally NOT apply at:
Annual Mean	All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to other locations at the building façade) or any other location where public exposure is expected to be short term.
24 Hour Mean and 8 Hour Mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties	Kerbside sites (as opposed to other locations at the building façade) or any other location where public exposure is expected to be short term.

11 Defra, "LAQM Technical Guidance (TG22)" (Department for Food, Environment and Rural Affairs (Defra), August 2022), https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

Averaging Period	Objectives should apply at:	Objectives should generally NOT apply at:
1 Hour Mean	All locations where the annual Mean and: 24 and 8-hour mean objectives apply. Kerbside site (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railways stations etc. which are not fully enclosed, where members of the public might be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expect to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15 Minute Mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes	

2.2 Local Air Quality Management

Obligations under the Environment Act 2021[12] (which provides an amendment to the Environment Act 1995[13]) requires local authorities to review and assess air quality in their administrative boundaries. Where AQALs are predicted to be exceeded, the local authority must declare an Air Quality Management Area (AQMA) at sensitive receptor locations and formulate an Air Quality Action Plan (AQAP) to reduce pollution concentrations to values below AQALs.

CDC's declared AQMAs are discussed in Section 4.1 of this AQA. CDC's most recent AQAP was published in 2024[14]. This plan details the priority measures being implemented to improve local air quality under the following broad themes:

- Priority 1 – Strengthening local policy to improve air quality and its role in protecting health;
- Priority 2 – Reducing NO_x emissions from cars in all AQMAs;
- Priority 3 – Ensuring new developments encourage and facilitate low emission and alternative transport;
- Priority 4 – Ensuring transport infrastructure delivery takes account of air quality improvement potential within AQMAs; and,
- Priority 5 – Raising awareness of poor air quality and encouraging improvement actions by vehicle users and fleet managers.

12 https://bills.parliament.uk/bills/2593/publications

13 Environment Agency, "Environment Act 1995" (The Environment Agency, 2002),http://www.legislation.gov.uk/ukpga/1995/25/contents.

14 https://modgov.cherwell.gov.uk/documents/s55456/Appendix%201%20-%20Air%20Quality%20Action%20Plan%202024.pdf

2.3 National Planning Policy Framework

The National Planning Policy Framework (NPPF)[15] sets out the Government's planning policy for England. It requires planning decisions for any new development to prevent new and existing development from contributing to, or being put at risk from, unacceptable levels of air pollution (paragraph 180). It also states that planning decisions should sustain and contribute towards compliance with relevant limit values or national objectives for air pollutants, taking into account the presence of AQMAs and Clean Air Zones (CAZ)s (paragraph 192), and the cumulative impacts from other sites (paragraph 191).

Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. Furthermore, planning decisions should ensure that any new development in AQMAs and CAZs is consistent with the local air quality action plan.

Also, to help reduce congestion and emissions; to improve air quality and public health, significant development should be focused on locations which are / can be made sustainable through limiting the need to travel (paragraph 109).

2.4 Planning Practice Guidance

Reference ID 32 (Air Quality) of the National Planning Practice Guidance (NPPG)[16], which was updated in November 2019, provides guiding principles on how planning can take account of the impact of new development on air quality. The NPPG summarises the importance of air quality in planning and the key legislation relating to it.

2.5 Local Planning Policy

The CDC Development Plan comprises the following (which contain policies of relevance to Air Quality and the Proposed Development):

- Adopted Cherwell Local Plan 2011-2031 (Part 1)[17]; and
- 'Saved' policies Local Plan 1996 (November 1996)[18];

The relevant planning policies from each of these plans are set out below:

2.5.1 Adopted Cherwell Local Plan 2011-2031 (Part 1)

Policy ESD 3: Sustainable Construction

> …
>
> *All development proposals will be encouraged to reflect high quality design and high environmental standards, demonstrating sustainable construction methods including but not limited to:*
>
> …
>
> *Reducing waste and pollution…*
>
> ….

Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment

Protection and enhancement of biodiversity and the natural environment will be achieved by the following:

15 Ministry of Housing, Communities and Local Government, "National Planning Policy Framework," December 2023, National Planning Policy Framework - GOV.UK (www.gov.uk)

16 Ministry of Housing, Communities & Local Government, "Reference ID (32) Air Quality" (Ministry of Housing, Communities & Local Government, 2023), https://www.gov.uk/guidance/air-quality--3.

17 https://www.cherwell.gov.uk/info/83/local-plans/376/adopted-cherwell-local-plan-2011-2031-part-1

18 https://www.cherwell.gov.uk/info/83/local-plans/373/adopted-local-plan-1996-november-1996

> ...
>
> *Air quality assessments will also be required for development proposals that would be likely to have a significantly adverse impact on biodiversity by generating an increase in air pollution*
>
> ...

2.5.2 'Saved' policies Local Plan 1996 (November 1996)

ENV1 Development likely to cause detrimental levels of pollution

> *DEVELOPMENT WHICH IS LIKELY TO CAUSE MATERIALLY DETRIMENTAL LEVELS OF NOISE, VIBRATION, SMELL, SMOKE, FUMES OR OTHER TYPE OF ENVIRONMENTAL POLLUTION WILL NOT NORMALLY BE PERMITTED.*
>
> *The Council will seek to ensure that the amenities of the environment, and in particular the amenities of residential properties, are not unduly affected by development proposals which may cause environmental pollution, including that caused by traffic generation.*
>
> ...

3. Methodology

3.1 Consultations and Pre-App Engagement

3.1.1 EIA Screening

A Screening opinion was obtained from CDC who confirmed on 1 July 2024 that due to the scale of development, the site characteristics, its location and context and the nature of the development, it is considered that this proposal does not require the submission of an Environmental Impact Assessment (EIA).

3.2 Guidance

The following guidance has been used to undertake this AQA:

- Defra's LAQM.TG (22)[1111];
- Environmental Protection UK (EPUK) & IAQM Land-use Planning & Development Control: Planning for Air Quality[19];
- The IAQM's guidance on assessing impacts from construction[20], and
- Guidance contained within CDC's AQAP, which requires Damage Costs to be calculated for all AQAs submitted for planning.

3.3 Baseline Air Quality

The baseline air quality conditions in the vicinity of the Site have been established through the compilation and review of the following sources. The baseline assessment can be found in Section 4.

- Defra's modelled background concentrations of AQS pollutants (UK-AIR)[21]. These estimates are produced using detailed modelling tools and are available as concentrations at central 1km^2 National Grid square locations across the UK. Mapped background concentrations have been obtained based upon the 2018 base year Defra update (August 2020 publication);
- Defra's predicted roadside concentrations of NO_2 produced from their pollution climate mapping (PCM)[22] model;
- Multi Agency Geographic Information for the Countryside (MAGIC)[23], which incorporates Natural England's interactive maps and;
- CDC's latest available air quality monitoring data, derived from the latest available air quality annual status report published in 2024[24].

3.4 Construction Phase Assessment

3.4.1 Dust Risk Assessment

The construction dust risk assessment is provided in Section 5 and has been undertaken in line with IAQM guidance. This considers the risk of impacts during the construction phase in terms of nuisance dust, human health (PM_{10} exposure) and ecological impacts.

---

19 EPUK & IAQM, "Land-Use Planning & Development Control: Planning for Air Quality" (Institute for Air Quality Management (IAQM), January 2017), http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf.

20 IAQM, "Guidance on the Assessment of Dust from Demolition and Construction" (Institute of Air Quality Management (IAQM)), January 2024), https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf

21 UK-AIR, "Background Mapping Data for Local Authorities - 2018," n.d., https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018.

22 https://uk-air.defra.gov.uk/data/gis-mapping/

23 https://magic.defra.gov.uk/MagicMap.aspx

24 [Available Online]: https://www.cherwell.gov.uk/download/downloads/id/15957/air-quality-annual-status-report-2024.pdf

With regard to ecological receptors, risk assessment should be taken where high-sensitivity receptors are located within 50m of a Site boundary, or within 50m of any routes used by construction vehicles on the public highway, up to 500m from the Site entrance. MAGIC website[23] has been reviewed to identify whether any statutory ecological sensitive receptors present in the area. *No receptors were identified within 50m of the Site boundary or expected Trackout route and therefore no further consideration of ecological receptors is required.*

Sensitive receptors were identified within 250m of the Site boundary. Based on the IAQM guidance residential dwellings, museums, car parks and car show room are indicative examples of high sensitivity receptors in relation to both dust soiling and health effects of PM_{10}. Indicative examples of medium sensitivity receptors include places of work, such as offices.

The IAQM guidance states that the potential dust emission magnitude from Demolition, Earthworks, Construction and Trackout should all be assessed individually. In addition, the sensitivity of the area to adverse dust impacts should also be defined.

The overall significance of the risk of adverse impacts during the construction phase can then be defined using the 'risk of impacts matrix' for each stage of the construction phase described above.

3.4.2 Construction Traffic Emissions

The IAQM guidance states that from experience of assessing exhaust emissions from site traffic, it is unlikely that any significant adverse impacts on local air quality would be caused and in the vast majority of cases, quantitative assessment is not needed. As such, short term effects of construction traffic emissions have not been assessed.

3.5 Operational Phase Assessment

3.5.1 Study Area

The scope of assessment has been determined against the EPUK & IAQM's two stage checklist criteria. The Proposed Development meets the Stage 1 Criteria for requiring an AQA and accordingly has been considered against the relevant Stage 2 checklist criteria, which identifies whether a detailed assessment of potential air quality impacts is required.

Stage 2 includes some criteria which are not directly relevant to the Proposed Development, such as those related to the realignment of roads within an AQMA, introduction of a new bus station, new road junctions and underground car parks. These have been excluded from this assessment and only relevant screening criteria have been included. The relevant checklist criteria shown in Table 3 identifies whether a detailed assessment of potential air quality impacts is required.

Table 3: EPUK & IAQM Assessment Criteria

Criteria	The Development Will:	Indicative Criteria to Proceed to a Detailed AQA:
1	Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV - cars and small vans <3.5t gross vehicle weight)	A change of LDV flows of: » more than 100 AADT within or adjacent to an AQMA » more than 500 AADT elsewhere
2	Cause a significant change in Heavy Duty (HDV) flows on local roads with relevant receptors (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: » more than 25 AADT within or adjacent to an AQMA » more than 100 AADT elsewhere.

Criteria	The Development Will:	Indicative Criteria to Proceed to a Detailed AQA:
3	Have one of more substantial combustion processes, where there is a risk of impacts at relevant receptors. NB. This includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.	Typically, any combustion plant where the single or combined NO_x emission rate is less than 5mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situation where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emissions rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

As the Site is not located within an AQMA, the less stringent criteria from Table 3 apply to local roads in the immediate vicinity of the Site. The Transport Consultants on the scheme, Hydrock, have confirmed that the daily trip generation figures are:

- 180 arrivals (5% HDV);
- 147 departures (6% HDV); and,
- **Total = 327 AADT (5,5% HDV).**

Therefore, the Proposed Development is anticipated to generate the following additional traffic flows:

- Light Duty Vehicle (LDV) AADT: **309**; and,
- Heavy Duty Vehicle (HDV) AADT: **18.**

In addition, AADT changes within CDC AQMA No. 4 Bicester (see Section 4.1 for further details.) where the more stringent criteria apply have also been calculated, as shown below:

- LDV AADT: **55**; and,
- HDV AADT: **0**.

Based on these additional trips, detailed assessment of impacts in the vicinity of the Site, including within the AQMA No. 4 has been scoped out.

Finally, it is understood that the Proposed Development will include an Energy Centre. No details of the type of plant associated with this were available at the time of writing this AQA. Therefore, it is not possible to undertake further assessment at this stage. As such, point source emissions have not been considered further within this AQA. Proposed draft condition wording is provided in Section 7 of this report.

3.6 Damage Cost Calculation

While detailed assessment of air quality impacts and effects and discrete locations of relevant exposure has been scoped out, as required by CDC's AQAP[14], a damage cost calculation has been undertaken. This approach recognises that while detailed assessment may be screened out in the merits of an individual application, potential incremental increases in emissions and cumulative effects may occur as part of a 'creeping baseline'. Damage Costs ensure that appropriate and proportionate mitigation is secured to control this.

Incremental increases in pollutant emissions (NO_X and $PM_{2.5}$) caused by the increase in traffic associated with the Proposed Development over a 5-year appraisal period have been estimated, using traffic data provided by Hydock, Defra's EFT (v.12.1)[25] and the latest version of Defra's Air Quality Appraisal: Damage Costs Toolkit (last updated March 2023)[26], which is used to apply the 'damage costs', which are a set of impact values, defined per tonne of emission by pollutant, to these development emissions.

25 Defra, "Emissions Factor Toolkit (EFT v12.1)", August 2024, https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/

26 Assess the impact of air quality - GOV.UK (www.gov.uk)

4. Baseline Air Quality Conditions

4.1 Air Quality Management Areas

The Site is not located in an AQMA. The closest AQMA to the Site is CDC's AQMA No. 4 Bicester[27], which was declared in 2015 for exceedances of the annual mean AQAL for NO_2. The location of the AQMA relative to the Site is shown below:

Figure 2: AQMA No 4 Bicester

4.2 Background Concentrations

Mapped background concentrations of NO_2, PM_{10} and $PM_{2.5}$ were downloaded for the grid squares containing the Site. Background pollutant concentrations for 2024 (the assessment year) and 2026 (the earliest opening year of the Proposed Development) are displayed in Table 4.

27 https://uk-air.defra.gov.uk/aqma/details?aqma_ref=1656#1260

Table 4: Defra Mapped Background Concentrations

Grid Square (x,y)	Pollutant	AQAL (µg/m³)	Annual Mean Concentration (µg/m³)	
			2024	2026
x460500, y220500	NO_2	40	7.9	7.4
	PM_{10}	40	15.6	15.4
	$PM_{2.5}$	20	8.9	8.7

The data show that annual mean background concentrations of NO_2, PM_{10} and $PM_{2.5}$ at the grid square within which the Site is located are below the AQALs in all years.

Concentrations of all pollutants are predicted to decline incrementally each year. These reductions are principally due to the forecast effect of the roll out of cleaner vehicles and strategies to reduce emissions across all sectors.

4.3 Air Quality Monitoring Data

4.3.1 Automatic Monitoring

CDC do not undertake any automatic monitoring as part of their LAQM network and no stations forming part of the Automatic Urban and Rural Network (AURN) were identified in the study area.

4.3.2 Passive Monitoring

CDC undertook non-automatic (i.e. passive) monitoring of NO_2 at 37 sites during 2022. Monitoring locations within close proximity to the Site are shown in Figure 3 and the data presented in Table 5.

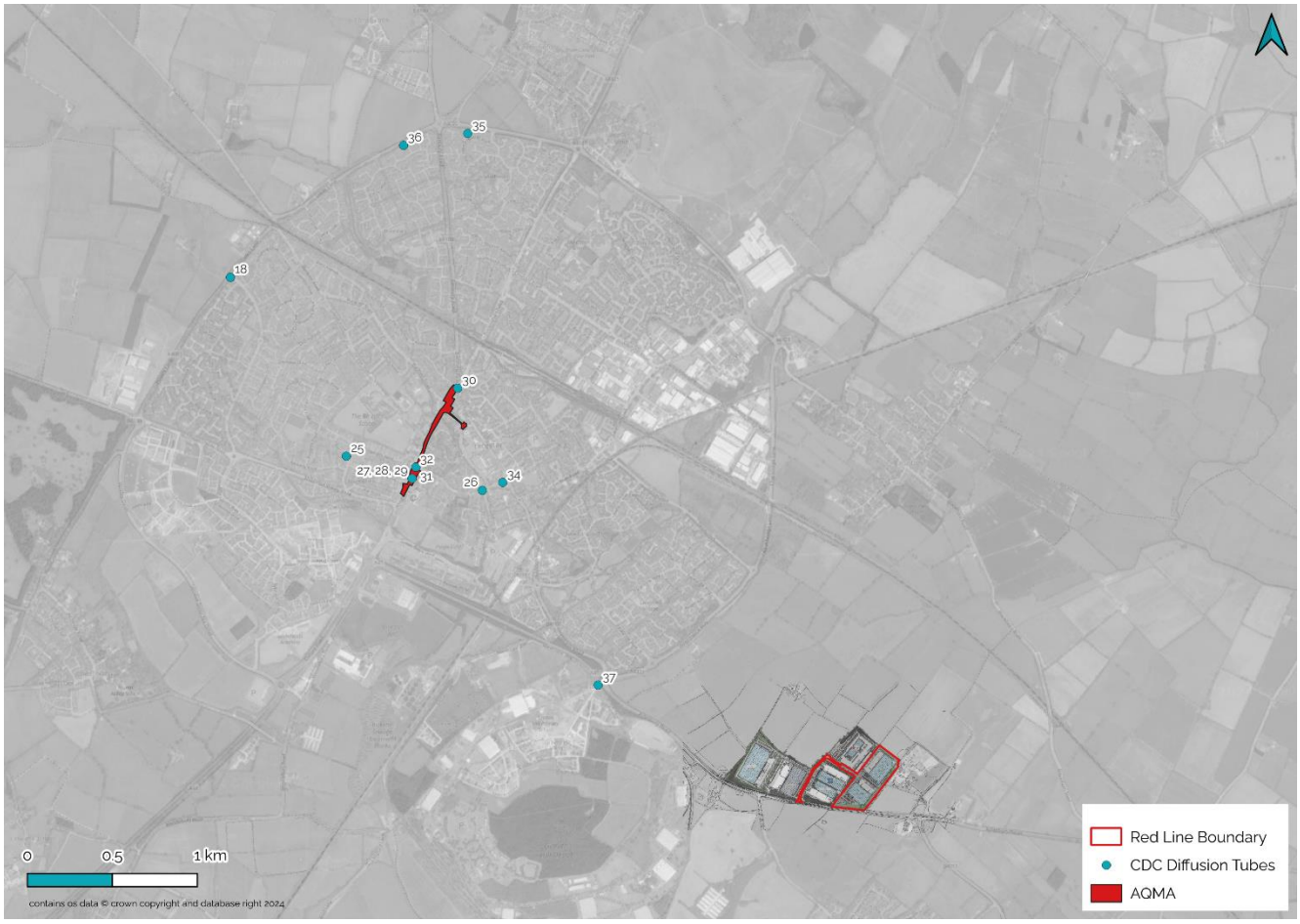

Figure 3: Local Authority Monitoring

Table 5: Passive Diffusion Tube Monitoring Concentrations

Site ID	Site Type	X (m)	Y (m)	Distance from Site (km)	Annual Mean NO_2 Concentration (µg/m³)				
					2019	2020	2021	2022	2023
37	Kerbside	459100	221190	1.3	35.6	27.6	27.9	27.9	28.8
34	Roadside	458539	222381	2.5	23.6	19.6	19.8	20.8	20.5
26	Urban Background	458419	222334	2.5	13.8	18.4	11.8	11.1	8.0
31	Urban Background	458028	222471	2.9	17.0	12.3	12.5	13.4	12.2
32	Urban Background	458028	222471	2.9	15.0	11.6	11.8	12.1	12.9
27,28,29	Kerbside	458006	222404	2.9	35.6	27.8	28.2	28.9	29.6
30	Roadside	458274	222935	3.1	**41.5**	34.5	34.9	32.6	32.2
25	Roadside	457619	222535	3.4	24.7	26.0	21.6	22.5	23.0
35	Kerbside	458333	224432	4.3	31.7	25.1	25.5	23.4	25.7
36	Kerbside	457956	224362	4.4	32.1	25.0	25.3	26.8	25.9
18	Kerbside	456937	223586	4.5	34	27.9	28.2	31.1	28.3
Notes:									

Site ID	Site Type	X (m)	Y (m)	Distance from Site (km)	Annual Mean NO_2 Concentration (µg/m³)				
					2019	2020	2021	2022	2023

Exceedances of the annual mean AQAL are shown in **BOLD**.

The data in Table 5 shows there has been one monitoring location which has exceeded the annual mean AQAL for NO_2 in recent years (2018 and 2019), at monitoring location 30 which is located in AQMA No 4.

Monitoring results across Cherwell showed a general trend downwards. The CDC ASR[24] recognises that while some monitoring locations showed very small increases when compared with 2022, however these were all in locations that were considerably lower than the annual mean objective

No other monitoring locations, including additional monitors in AQMA No 4, have monitored exceedances of the annual mean AQAL, and CDC state that the AQMA may be eligible for revocation further into the future.

Diffusion tube 37 is the closest monitoring location to the Site and is therefore considered to be most representative of conditions in the site locale. It is adjacent to the A41 and NO_2 concentrations have remained consistently below the annual mean AQAL.

There were no recorded exceedances of an annual mean greater than 60µg/m³, which indicates that an exceedance of the 1-hour mean AQAL is unlikely at these locations.

5. Construction Phase Assessment

5.1 Overview

The construction phase of the Proposed Development will involve a number of activities that will release polluting emissions to air. Predominantly, these will be emissions of dust. As such, a qualitative construction dust risk assessment has been carried out in accordance with IAQM guidance[20]. Where detailed information was unknown, the dust emission magnitude has been estimated based on professional judgement.

Construction activities will include:

- Demolition;
- material export and import;
- temporary stockpiling of materials;
- groundwork for foundations and services;
- construction of buildings;
- landscaping works; and
- vehicle movements (with the potential to track-out material from site).

5.2 Potential Dust Emission Magnitude

5.2.1 Demolition

There are a small number of minor existing structures within the site boundary that are likely to require demolition works as part of the proposals. The total building volume is estimated to be <12,000m^3 and the potential dust emission magnitude for demolition is estimated to be **'Small'**.

5.2.2 Earthworks

The total area of the Site is within the range of 18,000 - 110,000m^2 and is therefore within the 'Medium' IAQM category based on Site area.

The number of heavy earth moving vehicles that are likely to be active at any one time are considered unlikely to exceed 5-10 during peak construction works.

It is understood that the floor level proposed has been carefully considered in order to create a neutral 'cut & fill' design retaining all earthworks materials on Site to maximise the screening effect of the proposed earth bunding and landscape planting to the Site perimeter. The bunding height will be below 6m.

The underlying soil texture is *'Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'*[28]. Loamy soils have a high to medium potential for dust release due to the smaller particle size.

Based on the above, the potential dust emission magnitude for earthworks is considered to be '**Medium**'.

5.2.3 Construction

The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build.

The structure of the proposed buildings consists of long spanning steel portal frames. Elevations mainly comprise two types of metal cladding materials; micro-rib flat composite panels and trapezoidal profiled

28 Cranfield University, "Cranfield Soil and Agrifood Institute," n.d., http://www.landis.org.uk/soilscapes/.

cladding used in both vertical and horizontal orientations. Metal feature trims are also incorporated to add further visual interest.

Contractors will be required to work directly with manufacturers to ensure supplied materials are pre-cut to size to minimise wastage wherever possible. This will also ensure a higher construction standard.

Based primarily on the construction materials to be used, but accounting for the volume of the buildings to be erected, the potential dust emission magnitude for construction is considered to be '**Medium**' as a worst-case.

5.2.4 *Trackout*

The risk of impacts occurring during Trackout is predominantly dependent on the number of vehicles accessing the Site on a daily basis. However, vehicle size, speed and the duration of activities are also factors which are used to determine the risk of impacts.

Due to the size of the Site, it is anticipated that there could be 20-50 HDV outward movements from the Site, particularly during peak construction. Additionally, due to the large Site area there is the potential for unpaved road surfaces to be greater than 100m before Site traffic routes along existing road networks.

Based on the above, the potential dust emission magnitude during Trackout is considered to be '**Large**'.

5.2.5 *Summary*

Table 6 below shows a summary of the estimated potential dust emission magnitude from each activity, during each Phase.

Table 6: Dust Emission Magnitude Summary

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Medium
Construction	Medium
Trackout	Large

5.3 Sensitivity of Area

The prevailing wind direction for the closest regionally representative meteorological measurement station to the Site, at Benson, England is shown for 2019-2023 in Appendix A. The wind rose shows that the prevailing winds are from the south, with some winds from the south west.

Figure 4 shows the IAQM's construction phase assessment distance buffers (20m, 50m, 100m and 250m) around the Site boundary, as well as identified high and medium sensitivity receptor locations within these buffers.

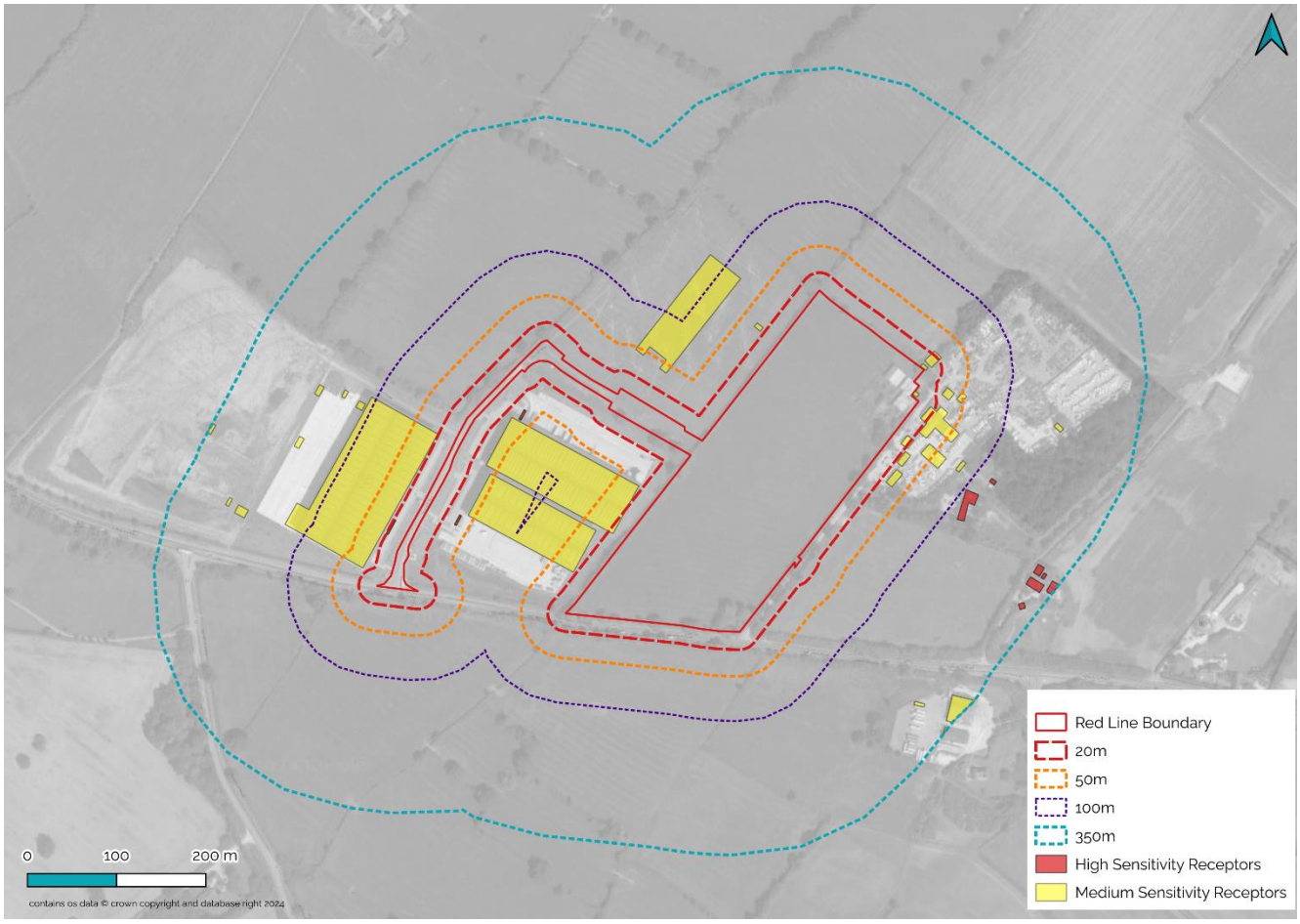

Figure 4: Construction Phase Receptors

5.3.1 Dust Soiling Impacts

Figure 4 illustrates that there are less than 10 high sensitivity human receptors within 250m of the Site boundary. However, as there are medium sensitivity receptors within 20m of the Site, the overall sensitivity of the surrounding area to nuisance dust soiling effects during Demolition, Earthworks, Construction and Trackout, according to IAQM guidance, is defined as '**Medium'**.

5.3.2 Human Health Impacts

Defra mapped background predictions (Table 4) show that annual mean concentrations of PM_{10} are not likely to exceed 24µg/m^3 in the vicinity of the Site. According to IAQM guidance, where PM_{10} concentrations are <24µg/m^3 and there are less than 100 high sensitivity receptors within 250m of construction works, the overall sensitivity of the surrounding area to human health impacts is defined as '**Low**' for Demolition, Earthworks, Construction and Trackout.

5.3.3 Summary of Area Sensitivity

The sensitivity of the surrounding area for the potential impacts discussed above is summarised in Table 7 below.

Table 7: Sensitivity of Local Area

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

5.4 Risk of Impacts

Using the methodology prescribed in the IAQM guidance, the overall risk of impacts can be defined by combining the sensitivity of the area with the potential dust emission magnitude of each stage of the demolition and construction phase as described above.

Table 8 provides a summary of the construction dust risk assessment. Overall, the development is considered to be **Medium Risk** for nuisance dust soiling effects and a **Low Risk** for PM_{10} health effects.

Table 8: Risk of Adverse Impacts During Construction Phase

Potential Impact	Risk of Impacts			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Medium Risk	Medium Risk	Medium Risk
Human Health	Negligible	Low Risk	Low Risk	Low Risk

6. Damage Cost Calculation

The central base damage costs for 'Road Transport Urban Small' have been used and these are provided below in £/tonne:

NO_x: £7,545

$PM_{2.5}$: £52,114

The damage cost calculation applies inflationary uplift factors of 2% cumulatively per annum to the central damage cost from Defra's damage cost valuations (2022) and assumes a discount rate of 1.5%. The calculation used in this assessment is summarised in the below general formula:

$$EFT\ output \times Damage\ costs \times 5\ years = 5\ year\ health\ exposure\ cost\ value\ (in\ £)$$

It is noted that emissions were calculated by assuming a reduction in emissions, in line with the EFT, for each year in the appraisal. This was accounted for as an input into Defra's EFT.

Table 9: Damage Cost Inputs

Input	Value	Unit	Source / Explanation
Trip Length	10	km	EPUK & IAQM guidance & National Travel Survey UK Average.
Traffic Flow	327 (5.5% HDV)	AADT	Scheme generated traffic, provided by Hydrock
EFT Road Type	Urban (Not London)	-	-
Appraisal Years	2026 - 2030 (5 years)	-	Five years following opening year.
Average Speed	80	kph	Signposted speed for A41

Using the above inputs, the emissions caused by the Proposed Development traffic are calculated for the years 2026 to 2030, which are the five years following the anticipated opening of the Proposed Development. The emissions per annum are shown below in Table 10.

Table 10: Increase in Emissions (tonnes)

Pollutant	Development Emissions (tonnes/year)				
	2026	2027	2028	2029	2030
NO_x	0.19085	0.16722	0.14554	0.12592	0.1086
$PM_{2.5}$	0.01731	0.01708	0.01691	0.01679	0.01669

These emissions are then converted to the cost of 'damage' to human health using the Air Quality Appraisal Damage Costs Toolkit. For this the price base year of 2024 was used. The results of this are shown below in Table 11:

Table 11: Calculated Damage Cost Outputs

Pollutant	Low Sensitivity Present Value	Central Present Value	High Sensitivity Present Value
NO_x	£1,138.3	**£5,714.1**	£21,040.8

Pollutant	Low Sensitivity Present Value	Central Present Value	High Sensitivity Present Value
$PM_{2.5}$	£1,790	**£4,516**	£12,923
TOTAL	£2,929	**£10,230**	£33,963

Based on the outputs in Table 11, the total emissions 'damage costs' for the Proposed Development (sum of, NO_x and $PM_{2.5}$) = **£10,230**, which is the indicative value of the real-world impact of emissions from the Proposed Development as a whole. Proportionate and targeted mitigation measures should be implemented up to the value of damage cost, as a minimum. The package of measures proposed, which is expected to outweigh the calculated damage cost, is discussed in Section 7.2,

7. Mitigation Measures

7.1 Construction Phase

The qualitative construction dust risk assessment shows that the works are **Medium Risk** for adverse impacts during both the demolition phase and construction phase, in the absence of mitigation.

It is understood that a construction environmental management plan (CEMP) will be developed to minimise the risk of dust generation and to ensure that construction vehicles follow appropriate routes to and from the Site. To effectively reduce the risk of impacts to Negligible, the CEMP should adopt the mitigation measures recommended at Appendix B of this report.

7.2 Operational Phase

The following mitigation is included within the Proposed Development:

- Minimising car-based commuting will be encouraged, and the occupation of the buildings will be subject to the approval of the Framework Travel Plan;
- Cycle shelters will be located in close proximity to the main office entrances. Pedestrian and cycle routes are segregated from routes used by motorised vehicles. Shower/changing facilities will be provided to all buildings to encourage non-car travel;
- 25% EV spaces to be provided and 5% of spaces are allocated for car share;
- Cycle parking at Symmetry Park will be provided in the form of Falcorail Cycle Canopies which feature double sided two -tier racks. It will be secure, covered, convenient and visible; and,
- Provision of a Solar PV array, with an initial day 1 commitment to power generation of 660 kWp (split by 370 kWp for Unit E and 290 kWp for Unit F), extending to 100% across the useable roof area (i.e. the omission of space taken by roof lights; man-safe working and the roof signage). This level of PVs may be installed by the applicant subject to individual occupier requirements or a technical ability and viability in the exportation of electricity generated by the PV array into the national grid.

This mitigation package detailed above is expected to sufficiently offset the calculated damage cost of **£10,230**.

7.3 Energy Centre

It has previously been noted that the Proposed Development will include an Energy Centre. No details of the type of plant associated with this are available at the time of writing this AQA. Therefore, as it is not possible to undertake further assessment at this stage the following potential draft planning condition could be considered:

> *No energy generating equipment shall be installed within the energy centre hereby approved unless and until a supplementary air quality assessment has been submitted to and approved in writing by the Local Planning Authority. This shall take into consideration the impact of emissions on, and associated with, the proposed new energy centre on existing receptors. The energy generating equipment shall not be provided other than in accordance with the approved details.*
>
> *REASON:*
>
> ***In the interest of residential amenity and to ensure the details are acceptable to the Local Planning Authority.***

8. Discussion and Conclusion

Hydrock, now Stantec have been commissioned by Tritax Big Box Developments (TBBD) (the 'client') to prepare an AQA for a site known as Symmetry Park, Bicester Phase 3.

Modelled UK-AIR background concentrations, and local air quality monitoring data have been used to establish baseline air quality at the Site and surrounding locale. Predicted background concentrations of NO_2, PM_{10} and $PM_{2.5}$ at the Site and surrounding locale are all below the relevant AQALs. Diffusion tube 37 is the closest monitoring location to the Site and is therefore considered to be most representative of Site conditions. It is adjacent to the A41 and NO_2 concentrations have remained consistently below the annual mean AQAL.

A qualitative construction dust risk assessment has been undertaken in line with IAQM guidance[20]. Through good practice and implementation of appropriate mitigation measures outlined, it is expected that the release of dust would be effectively controlled and mitigated, with resulting effects considered to be 'not significant'. All dust impacts are considered to be temporary and short-term in nature.

The total emission 'damage costs' of the Proposed Development (sum of NO_x and $PM_{2.5}$ emissions) have been calculated as based on the site generated traffic. Using Defra's Air Quality Appraisal Damage Costs Toolkit, the emissions generated have been applied to the damage costs spreadsheet resulting in the sums of **£10,230.** The proposed mitigation package detailed in Section 7.2 is expected to sufficiently offset this cost.

From the evidence presented, and by following the guidance provided herein, the Proposed Development will comply with all relevant air quality policy.

Appendix A Windrose

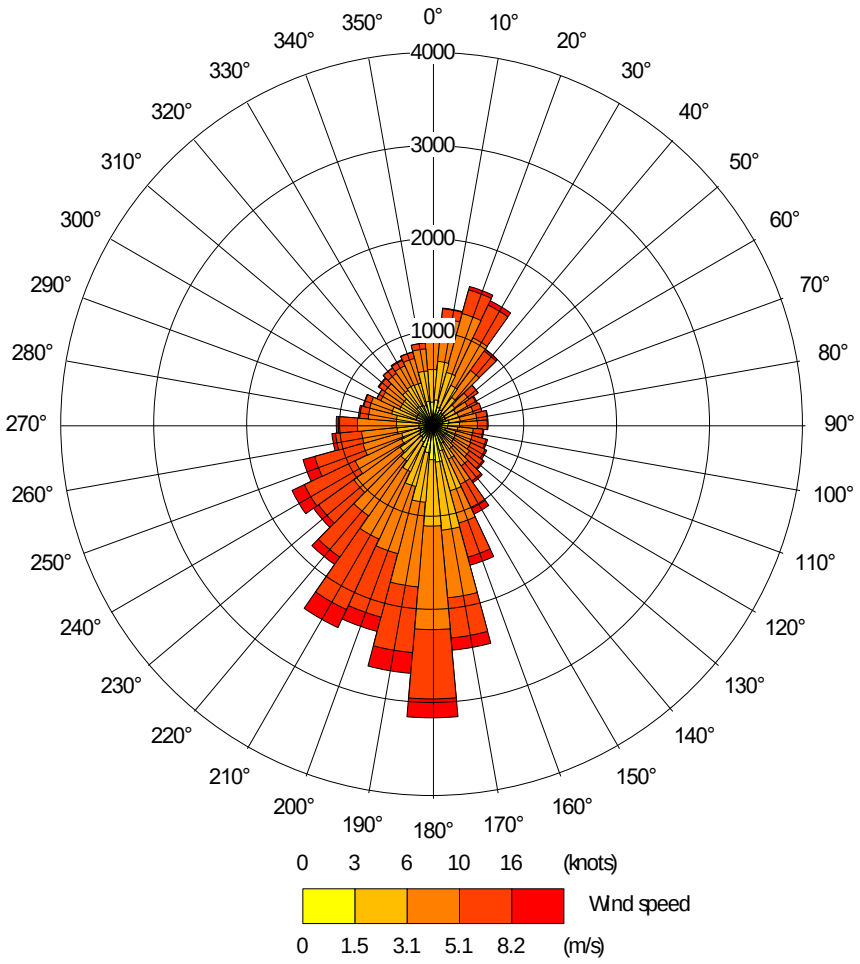

Figure 5: Wind rose - Benson (2019-2023)

Appendix B Construction Dust Mitigation

In order to mitigate the worst-case dust impacts the following general mitigation measures are highly recommended by the IAQM for Medium Risk construction sites.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information
- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.

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 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 DMP, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages, and clean up

Waste Management

- No bonfires and burning of waste materials.

Measures Specific to Demolition

- 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 needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives
- Bag and remove any biological debris or damp down such material before demolition

Measures Specific to Earthworks

- There are no Highly Recommended measures for Medium Risk sites,

Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Measures Specific to Trackout

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.

» Access gates to be located at least 10 m from receptors where possible.