
Land south of Furners Lane, Henfield

Air Quality Assessment

Air Quality Assessment: Land south of Furners Lane, Henfield



Quality management			
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Table of Contents

1	Introduction	1
1.1	Overview.....	1
1.2	Project Details.....	1
2	Legislation and Policy	3
2.2	National level	3
2.3	Local Policy	6
2.4	Guidance	6
3	Methodology	8
3.1	Introduction	8
3.2	Consultation with the Environmental Health Officer	8
3.3	Construction phase	8
3.4	Operational phase	10
3.5	Assumptions	10
4	Baseline Conditions	11
4.1	Introduction	11
4.2	Existing Baseline Conditions	11
4.3	Local Sensitive Receptors	12
5	Potential Impact	13
5.1	Construction Phase	13
5.2	Operational Phase	13
6	Proposed Mitigation Measure	15
6.1	Introduction	15
6.2	Emissions Mitigation Statement.....	15
7	Conclusion	17
	References	18

List of Tables

Table 2.1: Summary of relevant objectives of the National Air Quality Strategy (Defra et al., 2007).....	4
Table 2.2: Applying Relevant National Air Quality Objectives (Defra, 2022)	4
Table 3.1: Indicative criteria for requiring an AQA (Table 6.2 of EPUK and IAQM Guidance (EPUK and IAQM, 2017))......	9
Table 4.1 Annual mean NO ₂ (µg/m ³) monitoring results for relevant sites.....	12
Table 4.2: DEFRA projected background concentration for local authorities.....	12
Table 6.1: Change in emissions for NO _x and PM _{2.5} for 5 years of operation.....	15
Table 6.2: Output from Damage Cost Appraisal Toolkit using values from the calculated emissions in Table 6.1	16
Table 6.3: Proposed mitigation option and its total value.....	16

List of Figures

Figure 1.1: Site Plan	2
Figure 4.1: Location of site, existing HDC monitoring sites and associated AQMAs.....	11

1 Introduction

1.1 Overview

- 1.1.1 The Savills UK Ltd Environment and Infrastructure Team was appointed by Elivia Homes Eastern (the 'client') to complete an Air Quality Assessment (AQA) for the application for a residential development of circa 29 new dwellings (the 'proposed development') on land south of Furners Lane in Henfield (the 'site').
- 1.1.2 The AQA has been completed to accompany the planning application for the proposed development. The objectives are to review existing air quality in the area, assess the potential effects of the development on local air quality and consider appropriate measures to mitigate any effects.
- 1.1.3 The latest planning guidance from Environmental Protection UK (EPUK) in partnership with the Institute of Air Quality Management (IAQM) (EPUK and IAQM, 2017) the Department for Environment Food and Rural Affairs (Defra, 2024), the IAQM Guidance on the assessment of dust from demolition and construction (Version 2.2) (IAQM, 2024) and the Air Quality and Emissions Mitigation Guidance for Sussex (Sussex-air partnership, 2021), were utilised to assess the potential local air quality effects of the proposed development.

1.2 Project Details

- 1.2.1 The proposed development is situated between Furners Mead to the west and Backsettown to the east within the village of Henfield, as presented in Figure 1.1. The site falls within the administrative boundary of Horsham District Council (HDC).
- 1.2.2 HDC has two AQMAs (Storrington and Cowfold); the proposed development is not situated within either of these. The nearest AQMA to the site is Cowfold, which is 6.5km to the north of the site.
- 1.2.3 The site is not within any special ecological areas. However, the South Downs National Park (SDNP), a protected landscape because of its special qualities, is located approximately 2km to the south of the site (MAGIC, 2024).
- 1.2.4 The site is currently undeveloped land with no existing buildings but has access via a track running through the centre to access 'Backsettown House and Farmstead Bungalow'.
- 1.2.5 The proposed development will provide 29 dwellings, as 25 houses/bungalows and 4 flats. It will also comprise a new access directly from Furners Lane to access the dwellings as well as landscaping and a reinstated footpath (FP 2548).
- 1.2.6 In line with the West Sussex County Council's Guidance on parking at New Developments (West Sussex County Council, 2020), the proposed development will include 54 parking spaces. This is broken down into 2 parking spaces for each house/bungalow and 1 parking space for each flat. Similarly, the scheme will provide cycle parking in line with this document, with all dwellings incorporating cycle storage space for 2 cycles.
- 1.2.7 All properties within the proposed development will include air source heat pumps (ASHPs) and have electrical vehicle (EV) charging facilities in line with Part S of the building regulations. There will not be any gas boilers on the site.

Figure 1.1: Site Plan



1.2.8 As part of the air quality assessment, pollutants from road traffic emissions, NO₂ and particulate matter (PM₁₀ and PM_{2.5}) are discussed within Appendix A.

2 Legislation and Policy

The European Directive on ambient air and cleaner air for Europe

- 2.1.1 European Directive 2008/50/EC of the European Parliament and the Council of 21 May 2008 sets legally binding concentration-based limit values, as well as target values, for the protection of public health and sensitive habitats (European Union, 2008). The Directive was transposed into domestic law by the Air Quality Standards Regulations in England, Scotland, Wales and Northern Ireland in June 2010 (Gov.uk, 2010).
- 2.1.2 The pollutants included are sulphur dioxide (SO₂), nitrogen dioxide (NO₂), oxides of nitrogen (NO_x) particulate matter of less than 10 micrometres (µm) in aerodynamic diameter (PM₁₀), particulate matter of less than 2.5 µm in aerodynamic diameter (PM_{2.5}), lead (Pb), carbon monoxide (CO), benzene, ozone (O₃), polycyclic aromatic hydrocarbons (PAHs), cadmium (Cd), arsenic (As), nickel (Ni) and mercury (Hg).

2.2 National level

UK Air Quality Strategy

- 2.2.1 The Environment Act 1995 established the requirement for the Government and devolved administrations to produce a National Air Quality Strategy (AQS) for improving ambient air quality (UK Public General Acts, 1995). The AQS for England, Scotland, Wales and Northern Ireland was published in July 2007 and sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK (Defra et al., 2007).
- 2.2.2 The AQS sets standards and objectives for 10 main air pollutants in order to protect health, vegetation and ecosystems. These are benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen dioxide, particulate matter (PM₁₀ and PM_{2.5}), sulphur dioxide, ozone and polycyclic aromatic hydrocarbons.
- 2.2.3 The air quality standards are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on scientific and medical evidence. Objectives are policy targets expressed as a concentration that should be achieved, all the time or for a percentage of time, by a certain date. These are general concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects.
- 2.2.4 The limit values and objectives relevant to this assessment are summarised in Table 2.1.

Table 2.1: Summary of relevant objectives of the National Air Quality Strategy (Defra et al., 2007)

Pollutant	Objective ($\mu\text{g}/\text{m}^3$)	Averaging Period	Objective Limitation	Applicable to:
Nitrogen Dioxide (NO_2)	200	1-hour mean	Not to be exceeded more than 18 times a year	UK
	40	annual mean	-	
Particulate Matter (PM_{10})	50	24-hour mean	Not to be exceeded more than 35 times a year	
	40	annual mean	-	
Particulate Matter ($\text{PM}_{2.5}$)	20	annual mean	-	UK (except Scotland)
	Target of 15% reduction in concentrations at urban background		-	UK urban areas

2.2.5 Table 2.2 presents examples relating to the averaging period of the specific objectives to identify where objectives should and should not apply, and are relevant only to the members of the public (Defra, 2022).

Table 2.2: Applying Relevant National Air Quality Objectives (Defra, 2022)

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 façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties ^a .	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and: 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expect to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

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

The Environment Act 2021

2.2.6 The Environment Act 2021 established a legally binding duty on the government to set at least two new air quality targets, one of which must be in respect of the annual mean level of $\text{PM}_{2.5}$ in ambient air (Environment Act, 2021). In response to this, Defra have set two new legally-binding

long-term targets to reduce concentrations of PM_{2.5}. The two new targets are an annual mean concentration of 10 µg/m³ or below by 2040 and a reduction in average population exposure by 35% by 2040, compared to a 2018 baseline (Defra, 2023). These targets are not air quality objectives and so the AQOs stated in Table 2.1 remain the most up-to-date AQO, hence are the guidelines used throughout this report.

National Planning Policy Framework

2.2.7 The National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities, 2023) sets out the planning policies for England whereby conserving and enhancing the natural environment is a central theme.

2.2.8 Paragraph 180, section e of the NPPF states that:

“Planning policies and decisions should contribute to and enhance the natural and local environment by preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.”

2.2.9 Paragraph 192 of the NPPF states that:

“Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.”

2.2.10 The National Planning Practice Guidance (NPPG) (Ministry of Housing, Communities & Local Government, 2019) supports the NPPF and guides a range of topic areas, including air quality. The NPPG states:

“Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity.”

2.2.11 Additionally, it is recognised in the NPPG that the UK has legally binding limits for ambient air concentrations of major air pollutants (e.g., NO₂, PM₁₀ and PM_{2.5}).

2.3 Local Policy

The Horsham District Planning Framework (HDPF)

- 2.3.1 As the current Local Plan for HDC, The HDPF focuses on 6 priority themes, including the environment (Horsham District Council, 2015). One of the key issues highlighted in the HDPF was the effect on air quality due to increased traffic in the District and the AQMAs associated with nitrogen dioxide in Storrington and Cowfold. Overall, the HDPF states that *“the impact of increased traffic on air quality in the rest of the district will need to be considered and mechanisms to improve air quality should be put into place.”*
- 2.3.2 One of the key strategic policies in the HDPF, specifically highlighting air quality, is Policy 24 (Environmental Protection), which states:

“The high quality of the district’s environment will be protected through the planning process and the provision of local guidance documents. Taking into account any relevant Planning Guidance Documents, developments will be expected to minimise exposure to and the emission of pollutants including noise, odour, air and light pollution and ensure that they:

- a) Address land contamination by promoting the appropriate re-use of sites and requiring the delivery of appropriate remediation;*
- b) Are appropriate to their location, taking account of ground conditions and land instability;*
- c) Maintain or improve the environmental quality of any watercourses, groundwater and drinking water supplies, and prevents contaminated run-off to surface water sewers;*
- d) Minimise the air pollution and greenhouse gas emissions in order to protect human health and the environment;*
- e) Contribute to the implementation of local Air Quality Action Plans and do not conflict with its objectives;*
- f) Maintain or reduce the number of people exposed to poor air quality including odour. Consideration should be given to development that will result in new public exposure, particularly where vulnerable people (e.g. the elderly, care homes or schools) would be exposed to the areas of poor air quality; and*
- g) Ensure that the cumulative impact of all relevant committed developments is appropriately assessed.”*

2.4 Guidance

EPUK and IAQM Land Use Planning and Development Control

- 2.4.1 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) published the Land-Use Planning and Development Control: Planning for Air Quality guidance in January 2017 (EPUK and IAQM, 2017). This guidance sets out criteria for identifying when a more detailed assessment of operational impacts is required, guidance on undertaking detailed assessments and criteria for assigning the significance of any identified impacts. This guidance has been used where appropriate in this assessment.

IAQM Guidance on dust from demolition and construction

- 2.4.2 The guidance on the assessment of dust from demolition and construction provides an evaluation matrix to determine the potential risk of dust generation for demolition, earthworks, construction

and trackout by assessing the dust emission magnitude and the sensitivity of the surrounding area (IAQM, 2024). Dust and air emissions mitigation measures are recommended depending on the level of risk identified for the site. This guidance has been used where appropriate in this assessment.

The Air Quality and Emissions Guidance for Sussex

2.4.3 Adopted by HDC in 2021, the air quality and emissions guidance for Sussex (Sussex-air partnership, 2021) aims to provide:

- clarity as to how authorities intend to interpret relevant Local Plan policies;
- provides advice for developers and their consultants on how to assess and mitigate the impact that new developments may have on local air quality; and
- details a consistent approach by developers and local planning authorities (LPAs) to address impacts on local air quality, ensure optimum scheme design, reduce emissions and/or exposure, and avoid unnecessary delays in the planning process.

3 Methodology

3.1 Introduction

- 3.1.1 The development proposed is for circa 29 residential dwellings (i.e., the number of dwellings is 10 or above and will have more than 10 parking spaces) and the site extends to approximately 3.1 hectares (i.e., development carried out on land of 1 hectare or more) and so the development has been treated as though it is a 'Major Development' (EPUK and IAQM, 2017).
- 3.1.2 This section outlines the EHO comments received pertaining to air quality, and the methodology used in completing the air quality assessment for the construction and operational phases of the proposed project.

3.2 Consultation with the Environmental Health Officer

- 3.2.1 As part of this AQA, consultation took place with the Environmental Health Officer (EHO) at HDC via email correspondence. The following response was received, dated 2nd September 2024:

"As this is considered a major development it is required that the applicant provide an air quality assessment and an emissions mitigation statement, including a damage cost calculation.

With respect to the air quality assessment please also refer to West Sussex County Council Guidance on Parking at New Developments (September 2020); and for the baseline conditions, also refer to Defra's modelled background concentrations of Air Quality pollutants. Regarding Cowfold AQMA, if traffic generated by the development is expected to add more than 100 AADT going in Cowfold direction (A281) it will be necessary to assess the impact of the development in the AQMA.

The Mitigation measures for the proposed development should be in line with the Sussex Air (2021) Air Quality and Emissions Mitigation Guidance for Sussex. Recommended that the emission mitigation statement contain itemised costing for each proposed mitigation option and total value of all proposed emissions' mitigation. This should be equal to the value from Emissions calculation and total calculated value of emissions' health damage cost. Sussex Air quality guidance aims to avoid the duplication of measures that would normally be required through other regimes."

- 3.2.2 The approach was agreed to be sensible and appropriate. The EHO's comments have been taken into consideration as part of this AQA.

3.3 Construction phase

- 3.3.1 The assessment has been carried out assuming that the earliest possible year of construction commencement is 2025 and the earliest possible year of occupation is 2026.
- 3.3.2 For this assessment, the IAQM's 2024 Construction Dust Guidance (IAQM, 2024) was utilised to assess the potential impacts of dust during the construction phase. The IAQM guidance provides an evaluation matrix to determine the potential risk of dust generation and the associated level of mitigation required.

- 3.3.3 As a component of the dust assessment, receptor sensitivities were identified and impacts due to annoyance from dust soiling and the risk of health effects from an increase in exposure to PM₁₀ were assessed.
- 3.3.4 Additionally, the EPUK and IAQM planning guidance (EPUK and IAQM, 2017) was used to assess construction traffic generation. The EPUK and IAQM set out seven indicative criteria for requiring an AQA and as such, were considered in determining the need for an AQA, as shown in Table 3.1.

Table 3.1: Indicative criteria for requiring an AQA (Table 6.2 of EPUK and IAQM Guidance (EPUK and IAQM, 2017)).

The development will:	Indicative criteria to proceed with an AQA:
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans)	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
3. Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. NB this includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.	Typically, any combustion plant where the single or combined NO _x emission rate is less than 5 mg/s is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. ¹ In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

¹ As a guide, the 5 mg/s criterion equates to a 450 kW ultra-low NO_x gas boiler or a 30kW CHP unit operating at <95mg/Nm³. Users of the guidance should quantify the NO_x mass emission rate from the proposed plant, based on manufacturers' specifications and operational conditions.

3.4 Operational phase

- 3.4.1 The assessment relies on the planning guidance by EPUK and IAQM (EPUK and IAQM, 2017). The impact of existing sources in the local area and the impacts of the proposed development on the local area were considered in the assessment process.
- 3.4.2 As part of the assessment, the following factors are to be taken into account as per the guidance:
- the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;
 - the presence and location of AQMA as an indicator of local hotspots where the air quality objectives may be exceeded;
 - the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular NO₂), that would cause unacceptably high exposure for users of the new development; and,
 - the presence of a source of odour and/or dust that may affect amenity for future occupants of the development.
- 3.4.3 The EPUK and IAQM set out 7 indicative criteria for requiring an AQA and as such, these were considered in determining the need for an AQA, as shown in Table 3.1.
- 3.4.4 The indicative criteria presented in Table 3.1 were utilised for the assessment of the operational phase.

3.5 Assumptions

- 3.5.1 The assessment assumes the following:
- the construction year is 2025 and the duration is 2 years;
 - the first year of occupation is 2026;
 - the construction phase assesses impacts for the worst-case scenario; and
 - all mitigation measures proposed in 'Section 6: Proposed Mitigation Measures' will be implemented.

4 Baseline Conditions

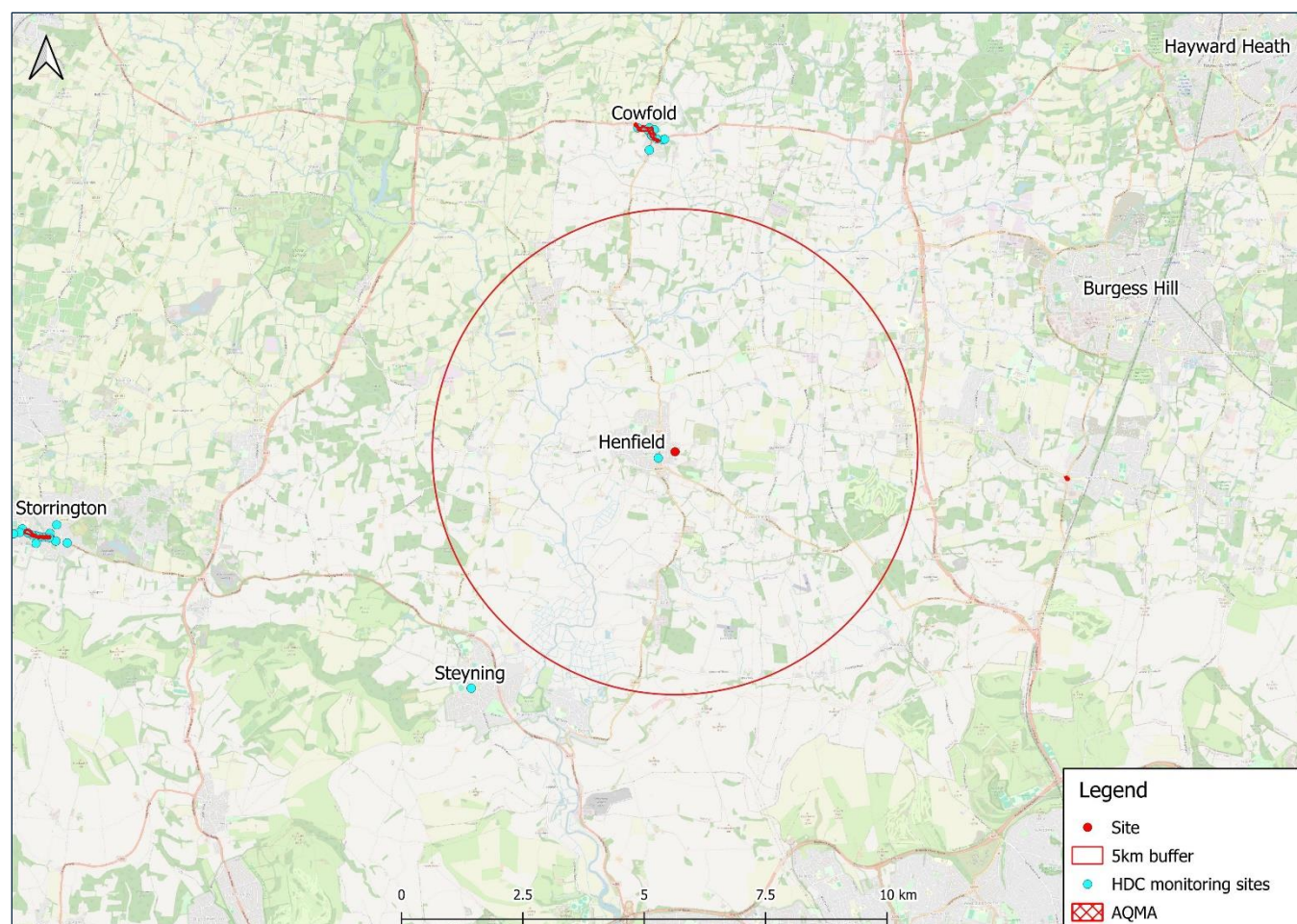
4.1 Introduction

4.1.1 The following section sets out the baseline conditions related to air quality for the proposed development. For this assessment, baseline data was obtained from the most recent HDC's Air Quality Annual Status Report (ASR) (Horsham District Council, 2024), the monitoring sites presented by HDC (Horsham District, 2023), and the background mapping data for local authorities from Defra (Defra, n.d.).

4.2 Existing Baseline Conditions

4.2.1 As previously mentioned, the site is not located within an AQMA nor in proximity to one. The closest AQMA to the site is that in Cowfold which is approximately 6.5 km north of the site.

Figure 4.1: Location of site, existing HDC monitoring sites and associated AQMAs



4.2.2 Based on the 2024 ASR, HDC have three automatic (continuous) monitoring stations for NO₂, two of which also monitor PM₁₀ and one of which monitors PM_{2.5}, alongside 49 non-automatic (passive) tubes across 42 sites which monitor NO₂.

- 4.2.3 The ASR notes that there were no monitoring sites where the annual mean NO₂ objective was exceeded in HDC. However, one location (47: Storrington 19n) within the Storrington AQMA measured concentrations within 10% of the annual mean objective.
- 4.2.4 Overall, the results of diffusion tube monitoring indicate a decrease of 9% in NO₂ concentrations at roadside locations in 2023 compared to the previous year. All long-term sites show a continuing overall downward trend in measured concentrations of NO₂ over the last five years, which applies to both roadside and background locations. The report notes that this is attributable to decreasing background concentrations and a gradual improvement in fleet emissions.
- 4.2.5 The closest station to the site is 'Henfield 1n', approximately 250m to the west of the nearest boundary of the site. There are no other stations within 5km of the site. Henfield 1n, as shown below in Table 4.1, has exhibited an overall reduction in monitored emissions over the past 5 years.

Table 4.1 Annual mean NO₂ (µg/m³) monitoring results for relevant sites

Name	2019	2020	2021	2022	2023
Henfield 1n	22.2	19.9	20.9	18.2	18.2

- 4.2.6 Defra provides background concentration maps to assist local authorities in undertaking their air quality review and assessments. The most recent 2018 reference year background maps are based on the monitoring and meteorological data for 2018 and present projected concentrations for the years 2018 to 2030 (Defra, n.d.). Defra notes that the projections for the 2018-based background maps are based on assumptions before the pandemic; they do not reflect short or long-term impacts on emissions in 2020 due to the pandemic.
- 4.2.7 Based on the 2018-based background maps for the year 2026, a separate 1x1km grid file of concentrations for HDC was downloaded for NO₂, PM₁₀, and PM_{2.5}. Table 4.2 presents the predicted background concentration for the year 2026 (the earliest year of occupation) within the grid square where the proposed development would be situated.

Table 4.2: DEFRA projected background concentration for local authorities

Pollutant	2026 Projected Concentration
NO ₂	7.18
PM ₁₀	8.63
PM _{2.5}	13.17
Data presented within the table is derived from the following ordinance survey grid squares: 521500, 116500.	

4.3 Local Sensitive Receptors

- 4.3.1 The site is located to the east of the village of Henfield. There are existing residential properties immediately to the north, east and west of the site.
- 4.3.2 There are no ecologically sensitive receptors in the immediate vicinity of the site. The SDNP is located approximately 2km to the south of the site.

5 Potential Impact

5.1 Construction Phase

5.1.1 As per the IQAM Dust Guidance (IAQM, 2024), there are four types of activities on construction sites:

- demolition;
- earthworks;
- construction; and,
- trackout.

5.1.2 The proposed development does not include any demolition works as the site currently consists of undeveloped land. For the remaining activities, potential dust impacts can arise from:

- annoyance due to dust soiling;
- the risk of health effects due to an increase in exposure to PM₁₀; and,
- harm to an ecological receptor.

5.1.3 As indicated in Section 4.3, ecological receptors were not assessed as the site and the nearest designated area, the SDNP, is located 2km to the south of the site.

5.1.4 To assess the risk of dust impacts for the relevant activities, the potential impact on dust soiling and human health was treated as being 'high risk' in order to obtain mitigation measures for the worst-case scenario and apply those measures which constitute good or best practice. As such, the general measures applicable to a high-risk site are applied and discussed in Appendix B, as outlined by IAQM.

Potential Impacts	Risk *			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	High Risk	High Risk	High Risk
Human Health	N/A	High Risk	High Risk	High Risk

* Potential impacts on dust soiling and human health were described as being 'high risk' in order to provide mitigation measures for the worst-case scenario.

5.1.5 The construction phase is anticipated to run for two years and no demolition would be required.

5.1.6 Within the construction phase, construction-related vehicles may potentially present an additional source of air pollutants within the proposed development site. However, construction traffic is anticipated to be well below 500 LDV and 100 HDV on any local road for the proposed development and any impacts from construction traffic should be minimised and addressed through the mitigation measures proposed in Appendix B, as per the guidance outlined by IAQM (IAQM, 2024). As such, the indicative EPUK & IAQM guidance thresholds are not exceeded and as such emissions from construction traffic has been scoped out of the AQA.

5.2 Operational Phase

5.2.1 As identified in Section 4.2, the baseline conditions indicate that NO₂ monitoring data for the most recent year (i.e., 2023) at the nearest location to the site is 18.2 µg/m³, significantly below the appropriate AQO of 40 µg/m³ which is derived to be protective of human health.

- 5.2.2 Based on the Transport Statement, it is expected that there will be an additional 156 vehicle trips per day based on the number of new dwellings. As such, in accordance with the EPUK and IAQM Planning Guidance, the proposed development will not cause a significant change in vehicle traffic flows (the indicative criteria relevant to the proposed development is a change of more than 500 annual average daily traffic (AADT) outside an AQMA).
- 5.2.3 Due to the design of the proposed access, all traffic will be encouraged to go into Henfield village reaching the A281. However, given the size and the importance of towns to the north and south of Henfield on the A281, it is likely that the split of traffic would be close to 50/50 and therefore unlikely that the AQMA towards Cowfold will be impacted by 100AADT+. As such, it is not necessary to further assess the impact of the proposed development on the AQMA in Cowfold.
- 5.2.4 The EPUK and IAQM set out 7 indicative criteria for requiring an AQA. Of the 7 indicative criteria, one is whether the proposed development has one or more substantial combustion processes. The proposed development will use ASHPs and electric boilers; therefore, no emissions will be generated by gas boilers and the NO_x emission rate of 5mg/sec limit presented in Table 3.1 is not relevant.
- 5.2.5 None of the indicative criteria proposed in the EPUK and IAQM Planning Guidance are triggered, as such the development may be considered to have insignificant effects. The development effectively responds to the relevant guidance on mitigation with the embedded measures proposed, including providing electric vehicle charging infrastructure, ASHPs, access to cycling storage spaces as well as footpaths and bridleways to allow for active travel.

6 Proposed Mitigation Measure

6.1 Introduction

- 6.1.1 The Air Quality and Emissions Mitigation Guidance for Sussex provides context on conducting quantitative emissions mitigation assessments that allow for a consistent approach to mitigation. The guidance follows a three-step process where the first step screens proposed developments based on their size, location, and impact. The developments which are retained after the first screening step are required to complete an emissions mitigation assessment to avoid, minimise and offset the impact on local air quality.
- 6.1.2 The emissions mitigation assessment is a quantitative assessment that assigns a monetary value to the additional emissions generated by traffic from the proposed development (based on outlined assumptions), which gives an indication of the value of mitigation that should be applied.
- 6.1.3 Overall, the proposed development will incorporate Principles of Good Practice and Good Design to reduce emissions and exposure to sensitive receptors. The proposed development will include EV charging for all houses in accordance with Part S of the Building Regulations 2021 (in force as of June 2022), and support active modes of transport (cycle storage and enhancement of footpaths). Additionally, the development will include ASHPs in place of gas boilers.

6.2 Emissions Mitigation Statement

Emission Calculations

- 6.2.1 The Emissions Factors Toolkit (EFT) (Defra, 2024) has been used to estimate the NO_x and PM_{2.5} emissions from the proposed development based on current and expected AADT flows from the site and along Handcross Road.
- 6.2.2 As stated in the Transport Statement, there will be an additional 156 vehicle trips per day associated with the proposed development.
- 6.2.3 When using the EFT the following assumptions were made:
- trip length used the National Travel Survey of the UK average of 10km;
 - an average speed of 50kph was applied; and
 - the IGCB damage costs applied were the IGCB Air Quality Damage Costs per tonne.

Table 6.1: Change in emissions for NO_x and PM_{2.5} for 5 years of operation

Emissions	2026	2027	2028	2029	2030
NO_x (tonnes/year)	0.0929	0.0814	0.0706	0.0607	0.0518
PM_{2.5} (tonnes/year)	0.0101	0.0100	0.0099	0.0098	0.0098
Note: Year 2025 emissions uses total existing development vehicles value, years' post-2025 use the total future proposed development AADT values, as shown above.					

- 6.2.4 From 2026 onwards there is a predicted steady decline in emissions, based upon the prediction which EFT makes of an increased use of e-vehicles and cleaner fuels.

Damage Cost Appraisal

- 6.2.5 The Damage Cost Appraisal Kit, published by Defra, has been used here to determine the estimated monetary value of health damage by NO_x and PM_{2.5} from additional traffic from the proposed new development.
- 6.2.6 Values from Table 6.1 have been used for this calculation. The overall cost is calculated to be £3,426, as presented in Table 6.2.
- 6.2.7 Table 6.3 presents the recommended mitigation option which this value could be contributed towards.
- 6.2.8 This calculator uses the price base year of 2024 and assumes a discount rate of 3.5% per year and 2% health uplift factor. The road type is classified as “Road Transport Rural”.

Table 6.2: Output from Damage Cost Appraisal Toolkit using values from the calculated emissions in Table 6.1

Emissions	2026	2027	2028	2029	2030
Central Value NO _x (£)	481	415	355	301	253
Central Value PM _{2.5} (£)	340	332	323	315	311
Total Cost (Central Present Value) NO _x = £1,805 Total Cost (Central Present Value) PM _{2.5} = £1,621 Overall Cost= £3,426					

Table 6.3: Proposed mitigation option and its total value

Mitigation Type	Mitigation Cost (£)
Support measures included in the Action Plan or Cowfold AQMA scheme proposals, available at Cowfold AQMA page (Horsham District Council, 2024) *	£3,426
Total Value	£3,426
* The Applicant could also consider contributions to improvements to existing foot or cycle ways, including providing routes which connect to an existing network should HDC prefer.	

7 Conclusion

- 7.1.1 The Savills UK Ltd Environment and Infrastructure Team was appointed by Elivia Homes Eastern (the 'client') to complete an Air Quality Assessment (AQA) for the application for the residential development of circa 29 new dwellings (the 'proposed development') on land to the south of Furners Lane in Henfield (the 'site').
- 7.1.2 The AQA has been completed to accompany the planning application, to review existing air quality in the area, assess the potential effects of the development on local air quality and consider appropriate measures to mitigate any effects.
- 7.1.3 To address the risk of dust impacts for construction-related activities (i.e., earthworks, construction and trackout), relevant mitigation measures for construction impacts appropriate for 'High Risk' effects, as proposed by the IAQM Dust guidance (2024), will be applied.
- 7.1.4 Based on the Transport Statement, the proposed development will not cause a significant change in vehicle traffic flows during both the construction and operational phases. According to the indicative screening criteria presented by EPUK and IAQM Planning Guidance (2017), the impacts for the operational phase are considered to have insignificant effects as none of the indicative criteria are triggered.
- 7.1.5 The proposed development will incorporate Principles of Good Practice and Good Design to reduce emissions and exposure to receptors. The proposals have been designed to actively take into account measures by which the development can help to address the issues associated with climate change; this includes EV charging points and ASHPs which will limit the emission of carbon dioxide and other harmful emissions. Additionally, the proposed development will support air quality improvement measures through its mitigation contribution.
- 7.1.6 Air quality at the site is considered to be very good having regard to all of the monitoring data and exposure to poor air quality for the residents is considered very unlikely.

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Air Quality Assessment: Land south of Furners Lane, Henfield



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Air Quality Assessment

Land south of Furners Lane,
Henfield,
Horsham.

Appendix A: Key Pollutants

1. Nitrogen Dioxide (NO₂)

- 1.1.1. Nitrogen Dioxide (NO₂) is a gas that falls under a larger group of reactive gases referred to as nitrogen oxides, including nitric oxide (NO) (USEPA , n.d.). Combustion processes are the main source of anthropogenic emissions of NO₂. NO₂ forms from emissions from vehicles, off-road equipment and power plants (USEPA , n.d.)
- 1.1.2. The health impacts of short-term exposure to NO₂ are irritation to the respiratory system and exacerbating symptoms of pre-existing lung and heart diseases (DEFRA, n.d.; DEFRA, 2021).
- 1.1.3. In the UK, NO₂ is considered a major air pollutant and as such, there is a legally binding limit for annual mean ambient air concentrations of NO₂ at 40 µg/m³.
- 1.1.4. It should be noted that the World Health Organisation (WHO) updated its air quality guidelines in 2021. The UK has yet to adopt these guidelines in their National Air Quality Objectives so the limits used here remain the most up-to-date hence are the guidelines used throughout the report.

2. Particulate Matter

- 2.1.1. Particulate matter consists of a variety of particles and compounds in the air and often particulate matter is discussed based on its size. Particles with a diameter of 10 microns or less are referred to as PM₁₀(WHO, n.d.). Particles with a diameter of microns or less are referred to as PM_{2.5} and are more concerning as they can be inhaled and carried deeper into the lungs.
- 2.1.2. The health impacts of exposure to fine particles include inflammation and irritation to the respiratory system and exacerbating symptoms of pre-existing lung diseases (Defra, n.d.; Defra, 2021). Although no threshold below which no damage to health is observed for particulate matter, there is a relationship between high concentrations of PM₁₀ and PM_{2.5} and increased mortality or morbidity (WHO, n.d.).
- 2.1.3. In the UK, PM₁₀ and PM_{2.5} are considered major air pollutants and as such, there are legally binding limits for annual average ambient air concentrations of PM₁₀ at 40µg/m³ and PM_{2.5} at 20 µg/m³(with a target for a 15% reduction in concentrations of urban background PM_{2.5}).
- 2.1.4. It should be noted, however, that the World Health Organisation (WHO) updated its air quality guidelines in 2021 (World Health Organisation, 2021). The UK is yet to determine whether to adopt these guidelines in its National Air Quality Objectives and so the above information remains the most up-to-date objectives.
- 2.1.5. The Environment Act 2021 establishes a legally binding duty on the government to bring forward at least two new air quality targets in secondary legislation by 31 October 2022; one of the targets currently in consultation concerns PM_{2.5}, it states that for PM_{2.5} "Annual Mean Concentration Target ('concentration target') -a maximum concentration of 10µg/m³ to be met across England by 2040"(Defra, 2022). As construction of the Proposed Development is set for completion in 2026, it is expected that construction and traffic pollution generated will not hinder the achievement of this objective by 2040 as it is likely that pollution levels will decrease over time with the expected increased uptake of electric vehicles and other alternative fuel vehicles in line with national and local policy for transport.
- 2.1.6. NO₂ and PM₁₀ are not mentioned within the two new air quality targets currently in consultation; however, the Committee on the Medical Effects of Air Pollutants (COMEAP) anticipates that most measures implemented to achieve reductions in PM_{2.5} would also be likely to reduce concentrations of other pollutants (UK Health Security Agency, 2022).

3. References

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Air Quality Assessment

Land south of Furners Lane,
Henfield,
Horsham.

Appendix B:
Mitigation Measures for Construction Impacts

Table of Contents

1.	Proposed Mitigation Measures	2
2.	References	8

List of Tables

Table 1.1 – Dust and Air Emissions Mitigation Measures (as proposed in the IAQM Guidance (2024))	3
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1. Proposed Mitigation Measures

- 1.1.1. The IAQM's 2023 Construction Dust Guidance (IAQM, 2024) was utilised in the Air Quality Assessment (AQA) to assess the potential impacts of dust during the construction phase of the proposed development. The IAQM guidance provides an evaluation matrix to determine the potential risk of dust generation and the associated level of mitigation required.
- 1.1.2. To assess the risk of dust impacts for the construction activities, the potential impact on dust soiling and human health were treated as being 'high risk' in order to obtain mitigation measures for the worst-case scenario and apply those measures which constitute good or best practice. This Appendix highlights the proposed mitigation measure for a high risk site.
- 1.1.3. Based on the IAQM guidance, the mitigation measures are divided into general measures applicable to all site and measures applicable specifically to demolition, earthworks, construction and trackout. Based on the AQA, the highest risk category was applied to the site, and as such, the general mitigation measures applicable to the high-risk sites have been applied, where proportionate and within reason.
- 1.1.4. The following table identifies the general mitigation measures proposed to be applied to the development.

Air Quality Assessment

Key to the table:

H Highly recommended

D Desirable

N Not required

Table 1.1 – Dust and Air Emissions Mitigation Measures (as proposed in the IAQM Guidance (2024))

Mitigation measure	Low Risk	Medium Risk	High Risk	Adopted for the Proposed Development
Mitigation for All Sites – Communications				
1. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	N	H	H	Yes
2. 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.	H	H	H	Yes
3. Display the head or regional office contact information	H	H	H	Yes
Mitigation for All Sites – Dust Management				
4. 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.	D	H	H	Yes, including visual inspections.

Air Quality Assessment

Mitigation measure	Low Risk	Medium Risk	High Risk	Adopted for the Proposed Development
Site Management				
5. 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.	H	H	H	Yes
6. Make the complaints log available to the local authority when asked.	H	H	H	Yes
7. 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.	H	H	H	Yes
8. Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.	N	N	H	Yes
Monitoring				
9. Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.	D	D	H	Yes, inspections are proposed to be conducted at an appropriate interval.
10. 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	H	H	H	Yes

Air Quality Assessment

Mitigation measure	Low Risk	Medium Risk	High Risk	Adopted for the Proposed Development
11. 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.	H	H	H	Yes
12. 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.	N	H	H	Yes, if required, monitoring details will be agreed upon with the Local Authority. Visual inspections will be carried out and recorded on a daily basis.
Preparing and maintaining the site				
13. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H	H	H	Yes
14. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H	H	H	Yes
15. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	D	H	H	Yes
16. Avoid site runoff of water or mud.	H	H	H	No, this is not proposed as it is not practical, although street sweeping will be utilised alongside wheel washing
17. Keep site fencing, barriers and scaffolding clean using wet methods.	D	H	H	No, this is not proposed as it is not practical and in the interests of water conservation
18. Remove materials that have a potential to produce dust from site as soon as possible,	D	H	H	Yes

Air Quality Assessment

Mitigation measure	Low Risk	Medium Risk	High Risk	Adopted for the Proposed Development
unless being re-used on site. If they are being re-used on-site cover as described below.				
19. Cover, seed or fence stockpiles to prevent wind whipping.	D	H	H	Yes
Operating vehicle/machinery and sustainable travel				
20. Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable	H	H	H	N/A
21. Ensure all vehicles switch off engines when stationary - no idling vehicles.	H	H	H	Yes
22. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	H	H	H	Yes
23. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)	D	D	H	Yes
24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	N	H	H	Yes
25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)	N	D	H	Yes

Air Quality Assessment

Mitigation measure	Low Risk	Medium Risk	High Risk	Adopted for the Proposed Development
Operations				
26. 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.	H	H	H	Yes, where practical. The use of power cutting, grinding and sawing will be discouraged.
27. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H	H	H	Yes
28. Use enclosed chutes and conveyors and covered skips.	H	H	H	Yes
29. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H	H	H	Yes
30. Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	D	H	H	Yes
Waste management				
31. Avoid bonfires and burning of waste materials.	H	H	H	Yes

Note. The AQA does not include emissions associated with contaminated soils.

2. References

IAQM. (2024, January). *Guidance on the assessment of dust from demolition and construction v2.2*. Retrieved from Institute of Air Quality Management: <https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf>