



Air Quality Assessment

Barn Conversion to Dwellinghouse

Land adjacent to The Cock Inn, Pilley Hill, Birdwell, Barnsley S70 5UD

Client

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Report Control

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1 Introduction

1.1 Overview

- 1.1.1 White Agus Partnership have appointed Viridian Air to provide an air quality and dust risk assessment and management plan with respect to a planning application for the conversion of a barn to dwellinghouse at the land adjacent to The Cock Inn, Pilley Hill, Birdwell, Barnsley S70 5UD (hereafter referred to as the site or the project site).
- 1.1.2 The planning application is to be submitted to Barnsley Metropolitan Borough Council (BMBC).
- 1.1.3 The air quality assessment of the proposed development has been assessed using the latest planning guidance¹ from the Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM), and the Local Air Quality Management – Technical Guidance from the Department for Environment, Food and Rural Affairs (Defra)².
- 1.1.4 Construction dust assessment and the development of the Dust Management Plan have been prepared based on the latest IAQM guidance on construction dust³.

1.2 Objectives

- 1.2.1 The main aim of this air quality assessment (AQA) is to develop an air quality and dust management plan (AQDMP) and determine the residential suitability of the new receptors introduced. This is to meet the planning requirement issued by Barnsley Metropolitan Borough Council (BMBC).
- 1.2.2 Planning Condition by BMBC states: *“The site is situated next to the M1 and the Cock Inn pub and is also located within an Air Quality Management Area (AQMA) and compliance with Local Plan Policy AQ1 and Poll1 is necessary which requires an Air Quality Assessment.”*
- 1.2.3 The AQA has the following objectives:
 - Relevance to national, regional and local air quality and appropriate planning guidance
 - Establishment of the background air quality at the site and comparison with the National Air Quality Objectives (AQOs).
 - Assessment of the risk of demolition and construction dust impacts
 - Define the potential dust emission magnitude
 - Define the sensitivity of the area
 - Define the risk of impacts
 - Recommendations for dust and emission control measures during demolition and construction phases
 - Evaluate the residential suitability of the nearby sensitive receptors using air quality data available from the Barnsley Metropolitan Borough Council.
- 1.2.4 The AQA will be based on the most recent air quality predictions and monitoring results from the BMBC's 2021 Annual Air Quality Status Report (ASR 2021)⁴.

¹ Land-Use Planning and Development Control: Planning for Air Quality (2017) Environmental Protection UK and Institute of Air Quality Management

² Defra (2016): 'Local Air Quality Management – Technical Guidance (TG16)'

³ IAQM (2016): 'Guidance on the Assessment of Dust from Demolition and Construction v1.1'

⁴ Barnsley MBC 2021 Air Quality Annual Status Report (ASR)

<https://www.barnsley.gov.uk/media/19969/asrtemplateengland2021v20-1-barnsley-mbc.pdf>

1.3 The Development

- 1.3.1 The proposal is for the conversion of a barn to dwellinghouse at the land adjacent to The Cock Inn, Pilley Hill, Birdwell, Barnsley S70 5UD. The access into the site will remain unchanged. There is a provision for three car parking spaces. The site provides outdoor amenity space for the occupants including storage bins.

1.4 Site Location

- 1.4.1 The site is within close proximity of motorway M1, in Birdwell area south of Barnsley. The site is mainly in a rural setting with residential areas nearby. The Cock Inn public house is adjacent to the site. The site layout is shown in Figure 1-1
- 1.4.2 The site is within the Barnsley Air Quality Management Area (AQMA) No 1 encompassing M1. The Barnsley AQMAs were declared for not meeting the NO₂ annual mean Air Quality Objective (AQO). The site setting in the local area is shown in Figure 1-1.
- 1.4.3 There are no Site of Special Scientific Interest (SSSI) within 500m of the site.
- 1.4.4 Site Plan is shown in Figure 1-2. Detailed site and floor plans, as provided by the client are shown in Appendix 2.

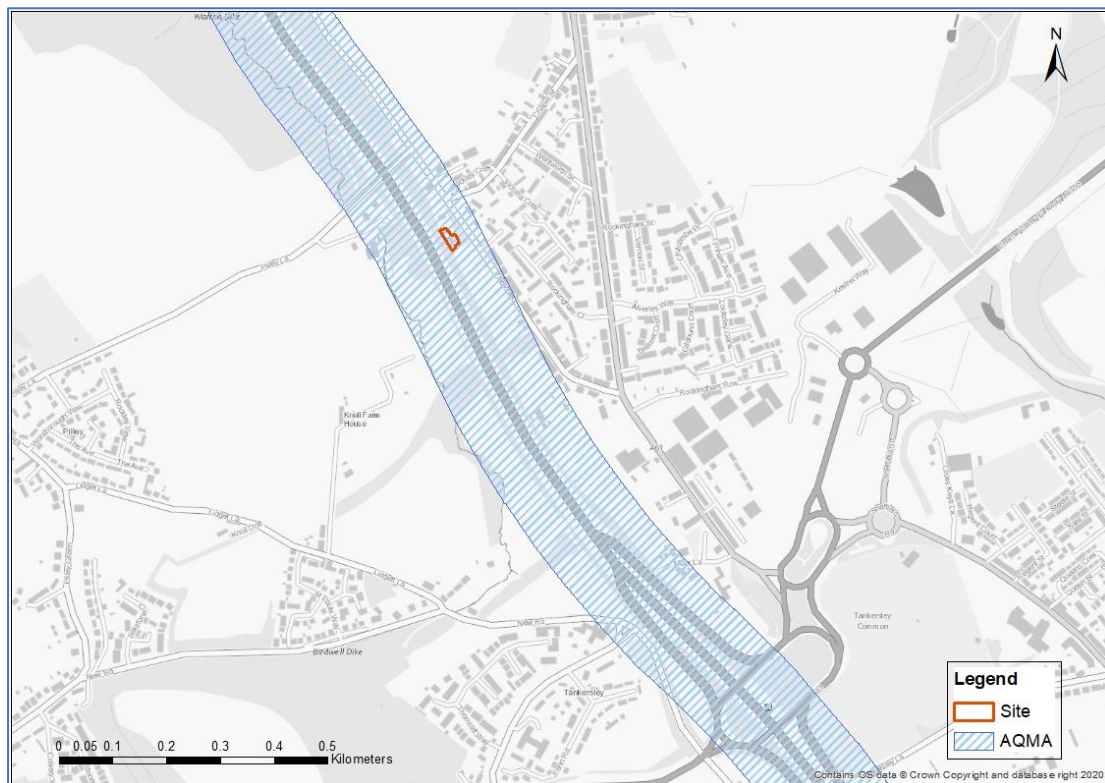


Figure 1-1 Site Layout

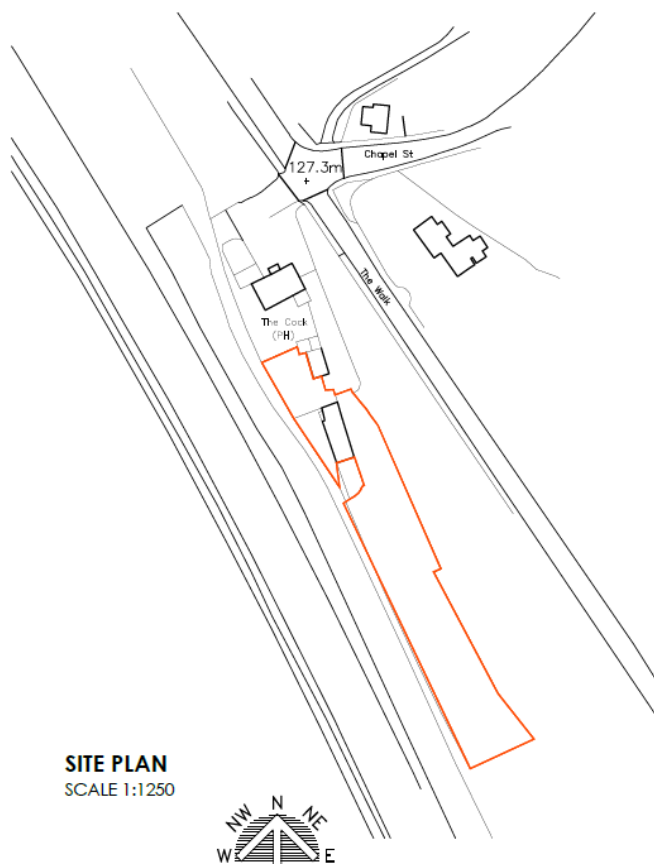


Figure 1-2 Site Plan

(Source: White Agus Partnership)

1.5 Pollutants

The key pollutants associated with the operational phase of the proposed development will be construction emissions, and road traffic emissions including nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) from the surrounding road network (mainly M1). These pollutants are therefore considered as part of this assessment.



2 Legislation and Policy Context

2.1 National Level

2.1.1 National Air Quality Objectives

The UK government has a legal responsibility to meet the EU limit values. Part IV of the 1995 Environment Act⁵ sets guidelines for protecting air quality in the UK and forms the basis of the local air quality management. The Environment Act requires local authorities in the UK to review air quality in their area periodically and designate 'Air Quality Management Area' (AQMA) if improvements are necessary. Where an AQMA is designated, local authorities are also required to produce an 'Air Quality Action Plan' detailing the pollution reduction measures that need to be adopted to achieve the relevant air quality objectives within an AQMA.

As part of the Environment Act, the UK Government was required to publish a National Air Quality Strategy (NAQS) to establish the system of 'local air quality management' (LAQM) for the designation of AQMAs. The latest air quality strategy, called Clean Air Quality Strategy⁶ was published in 2019. The Strategy aims to establish a common framework to protect human health and the environment by achieving ambient air quality improvements. The 2008 EU ambient air quality directive 2008/50/EC was transposed to England law through the introduction of the Air Quality (Standards) Regulations in 2010⁷. The Clean Air Quality Strategy covers a range of pollutants, including a number that are directly relevant to this study: particulate matter (as both PM₁₀ and PM_{2.5}), carbon monoxide, sulphur dioxide, nitrogen dioxide and benzene.

A summary of the relevant Air Quality Objectives (AQO) and the types of receptors that are relevant to this assessment are presented in Table 2-1. The AQO listed in Table 2-1 applies only at locations with relevant exposure where a member of the public could be exposed to a level of pollution concentration for the specific averaging periods for that pollutant.

Table 2-1: AQO Relevant to the Proposed Development

Pollutant	Air Quality Objectives		Concentration measured as	Note
	Concentration	Allowance		
Nitrogen Dioxide (NO ₂)	200 µg/m ³	18 per year	1-hour mean	Air Quality Objective (AQO)
	40 µg/m ³		Annual mean	AQO
Particulate Matter (PM ₁₀)	50 µg/m ³	35 per year	24-hour mean	AQO
	40 µg/m ³		Annual mean	AQO
Particulate Matter (PM _{2.5})	25 µg/m ³		Annual mean	AQO

⁵ Parliament of the United Kingdom. (1990), 'Environmental Protection Act', Chapter 43. Queen's Printer of Acts of Parliament.

⁶ Clean Air Strategy (2019) <https://www.gov.uk/government/publications/clean-air-strategy-2019>

⁷ Statutory Instrument. (2010), 'The Air Quality Standards Regulations', No. 1001. Queen's Printer of Acts of Parliament.



2.1.2 National Planning Policy Framework

The principal national planning policy guidance in respect of the proposed development is the National Planning Policy Framework (NPPF)⁸. The most recent update of the NPPF was published in July 2021 by Ministry of Housing, Communities and Local Government. NPPF sets out the government's planning policies for England and how these are expected to be applied. The NPPF Section 174 states that:

"The planning system should contribute to and enhance the natural and local environment by:..... preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability....."

Section 186 states that: *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement."*

2.1.3 Relevant National Planning Practice Guidance

The DCLG published a number of supporting web-based resources of Planning Practice Guidance (PPG)⁹ to supplement the NPPF. With respect to air quality PPG provide guidance on when air quality is relevant to a planning application. It states that:

"Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife)."

2.1.4 Statutory Nuisance

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

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

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

⁸ National Planning Policy Framework. Accessible at:

<https://www.gov.uk/government/publications/national-planning-policy-framework--2>

⁹ National Planning Practice Guidance web-based resource. Accessible at:

<http://planningguidance.planningportal.gov.uk/>



2.2 Local – Barnsley Metropolitan Borough Council

2.2.1 Barnsley Local Plan

The adopted Local Plan¹⁰ and policies map sets out how the council will manage physical development of the borough on behalf of residents and businesses. This includes providing sufficient land in the right places to attract more businesses into the borough and to allow existing businesses to grow. The aim of this is to create more and better jobs to improve earnings and increase opportunities for local residents. It also aims to provide improved housing to meet existing need and the needs of future generations whilst at the same time protecting what is special about the borough.

Following public consultation and examination by an independent planning inspector, Barnsley's Local Plan was adopted by Full Council on 3 January 2019.

2.2.2 Supplementary Planning Documents (SPDS)

Following the adoption of the Local Plan, BMBC has produced new and updated supplementary planning documents (SPD) which contain advice for applying for planning permission. BMBC use these to help it make decisions on planning applications alongside the Local Plan. One particular SPD specific to this development is the SPD on Barn Conversions (adopted May 2019).

2.2.3 Policy Poll1 Pollution Control and Protection

This policy states:

“Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air, surface water and groundwater, noise, smell, dust, vibration, light or other pollution which would unacceptably affect or cause a nuisance to the natural and built environment or to people.

We will not allow development of new housing or other environmentally sensitive development where existing air pollution, noise, smell, dust, vibration, light or other pollution levels are unacceptable and there is no reasonable prospect that these can be mitigated against.

Developers will be expected to minimise the effects of any possible pollution and provide mitigation measures where appropriate”.

2.2.4 Policy AQ1 Development in Air Quality Management Areas

The following policy excerpt is important for this report:

“Development which impacts on areas sensitive to air pollution in air quality management areas will be expected to demonstrate that it will not have a harmful effect on the health or living conditions of any future users of the development in terms of air quality (including residents, employees, visitors and customers), taking into account any suitable and proportionate mitigation required for the development.

We will only allow residential development which impacts on areas sensitive to air pollution, where the developer provides an assessment that shows living conditions will be acceptable for future residents, subject to any required mitigation.

We will only allow development which impacts on areas sensitive to air pollution which could cause more air pollution, where the developer provides an assessment that shows there will not be a significantly harmful effect on air quality, subject to any required mitigation. Furthermore, development which impacts on areas sensitive to air pollution due to traffic emissions will be expected to demonstrate suitable and proportionate mitigation relative to the increased traffic emissions generated by the development”.

¹⁰ Barnsley Local Plan <https://www.barnsley.gov.uk/media/17249/local-plan-adopted.pdf>



3 Assessment Methodology

3.1 Overview

- 3.1.1 This section provides the details of the methodological approach and the criteria that have been used to assess the significance of risk associated with the proposed development.

The following key information sources have been used in this air quality assessment.

Table 3-1 Source of Information used for AQA

Information Source	Details
Department for Environment, Food and Rural Affairs (Defra)	• Defra (2018). LAQM Background Maps - 1 x 1 km grid background maps for NO_x, NO₂, PM₁₀ and PM_{2.5} • The Local Air Quality Management Tools contain information pertaining to monitoring networks across the UK and provides tools, which aid in the estimation of pollutant concentrations with reference to the year of study.
The National Atmospheric Emissions Inventory (NAEI)	Emission data relating to various activities including vehicle fleet composition for the study year
Environmental Protection UK (EPUK) & Institute of Air Quality Management (IAQM)	• IAQM (2014). Guidance on the assessment of dust from demolition and construction • The EPUK & IAQM Land-Use Planning & Development Control: Planning for Air Quality (2017) provides advice and guidance on how an air quality assessment should be undertaken.
IAQM	• The Control of Dust and Emissions During Construction and Demolition – Supplementary Planning Guidance (2014)
Barnsley Metropolitan Borough Council	• Barnsley Local Plan • Policy Poll1 Pollution Control and Protection • Policy AQ1 Development in Air Quality Management Areas



3.2 Scope of Air Quality Assessment

- 3.2.1 This Air Quality Assessment considers the suitability of the site for the proposed development and assesses whether any significant air quality impacts are anticipated as a result of the construction and/or the operation of the proposed development.
- 3.2.2 A staged assessment approach has been adopted. This ensures that the approach taken for the assessment of risk is proportional to the risk of an unacceptable impact being caused. Where a simple review of the likely impacts associated with the proposed development clearly demonstrates that the risk of a health/annoyance impact is negligible, this will be sufficient to conclude that no further or detailed assessment is necessary. In cases where the risk involved cannot be regarded as negligible, a more detailed and quantitative assessment will be undertaken.

3.3 Dust Risk Assessment

- 3.3.1 The Institute of Air Quality Management (2016): 'Guidance on the Assessment of Dust from Demolition and Construction v1.1' provides a methodology to evaluate potential risk of dust generation for a development and the level of mitigation required. The impact of the development is described using one of the following three categories: 'Low Risk', 'Medium Risk' and 'High Risk'. Based on the risk level, appropriate mitigation measures can be considered to minimise any effects of dust from the construction phase.
- 3.3.2 The IAQM Guideline recommend that the assessment procedure follows the following framework:
- Screen the requirement for a more detailed assessment
 - Assess the risk of dust impacts of the four phases of construction (demolition, earthworks, construction and trackout), taking into account:
 - the scale and nature of the works, which determines the potential Dust Emission Magnitude; and
 - the sensitivity of the area.
 - Determine the site-specific mitigation for the potential activities
 - Examine the residual effects and determine whether or not these are significant; and
 - Prepare the Construction Dust Assessment
- 3.3.3 This follows a sequence of steps. Step 1 is a basic screening stage, to determine whether a more detailed assessment is required. Step 2A determines the potential for dust to be emitted or re-suspended from on-site works and by vehicles leaving the site. Step 2B defines the sensitivity of the area to any dust that may be emitted or resuspended. Step 2C combines the information from Steps 2A and 2B to determine the risk of dust impacts without appropriate mitigation. Step 3 uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant impacts.

Step 1 – Identify the Need for a Detailed Assessment

- 3.3.4 In the process of screening the need for a detailed assessment, the following criteria is used:
- "An assessment will normally be required where there is:
- a 'human receptor' within:
 - 350m of the boundary of the site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).
 - an 'ecological receptor' within:
 - 50m of the boundary of the site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s)."



Step 2 – Assessment of the Risk of Dust Impacts

- 3.3.5 A site is allocated a risk category on the basis of the scale and nature of the works (Step 2A) and the sensitivity of the area to dust impacts (Step 2B). These two factors are combined in Step 2C to determine the risk of dust impacts before the allocation of mitigation. An assessment would normally be required where there is:
- 3.3.6 A human receptor within 350 metres of the proposed scheme; and/or within 50 metres of the access route(s) used by the demolition vehicles on the public highway up to 500 metres from the study area site entrance(s); and/or
- 3.3.7 An ecological receptor within 50 metres of the proposed scheme and/or within 50 metres of the access route(s) used by demolition vehicles on the public highway up to 500 metres from the site entrance(s).
- 3.3.8 A human receptor refers to any location where a person or property may experience the adverse effects of airborne dust or dust-soiling, or exposure to particulate matter (PM10) over a period relevant to the ambient air quality objectives.
- 3.3.9 An ecological receptor refers to any sensitive habitat affected by dust soiling. For locations with a statutory designation, such as a National Nature Reserve (NNR), Ramsar site, Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) or Special Protection Areas (SPA), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered if appropriate, such as a Site of Importance for Nature Conservation (SINC).
- 3.3.10 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible', and any effects would be 'not significant'.
- 3.3.11 Risks are described as low, medium or high for each of the four separate activities (demolition, construction, earthworks and trackout). Site-specific mitigation is required, proportionate to the level of risk.
- 3.3.12 Step 2A – Defining the Potential Dust Emission Magnitude
- The dust emission magnitude is based on the scale of the anticipated works and is classified as Small, Medium, or Large (Table 3-2).


Table 3-2 Dust Emission Magnitude

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

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

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

3.3.13 Step 2B – Defining the Sensitivity of the Area

The sensitivity of the area takes account of a number of factors:

- The specific sensitivities of receptors in the area.
- The proximity and number of those receptors.
- In the case of PM₁₀, the local background concentration; and
- Site-specific factors, such as whether there are natural shelters, such as trees or other vegetation, to reduce the risk of wind-blown dust.

Table 2 of the IAQM Guidance describes the sensitivity of the area to dust and soiling effects on people and property.

Table 3 of the IAQM Guidance describes the matrix for determining sensitivity of the area to human health impacts.

Table 4 of the IAQM Guidance describes the matrix for determining sensitivity of the area to ecological impacts.



3.3.14 Step 2C – Defining the Risk of Impacts

The dust emission magnitude determined in STEP 2A is combined with the sensitivity of the area determined in STEP 2B to determine the risk of impacts with no mitigation applied.

The matrices in the IAQM Guidance Tables 6, 7 8 and 9 provide a method of assigning the level of risk for each activity. These is used to determine the level of site-specific mitigation that must be applied.

3.3.15 Step 3: Site-specific mitigation

Step three of the IAQM Guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low-, medium- or high-risk site. The highest risk category of a site (of all activities being undertaken) is recommended when considering appropriate mitigation measures for the site. Where risk is assigned as 'negligible', no mitigation measures beyond those required by legislation are required. However, additional mitigation measures may be applied as good practice.

A selection of these measures is specified as suitable to mitigate dust emissions from activities, based on professional judgement.

3.3.16 Step 4: Determine significant effects

Following Step 2 (definition of the proposed scheme and the surroundings and identification of the risk of dust effects occurring for each activity), and Step 3 (identification of appropriate site-specific mitigation), the significance of the potential dust effects can be determined. The recommended mitigation measures should normally be sufficient to reduce construction dust impacts to a not significant effect.

Step 4 of IAQM guidance recognises that the key to the above approach is that it assumes that the regulators ensure that the proposed mitigation measures are implemented. The management plan would include the necessary systems and procedures to facilitate on-going checking by the regulators to ensure that mitigation is being delivered, and that it is effective in reducing any residual effect to 'not significant' in line with the guidance

3.4 Transport Emissions

3.4.1 The EPUK & IAQM 2017 Guidance – 'Land Use Planning & Development Controls - Planning For Air Quality' has been used to assess potential traffic impacts associated with the development.

3.4.2 Table below provides the criteria used for screening the need for an Air Quality Assessment.

**Table 3-3 EPUK/IAQM Criteria for Screening the Need for AQA**

The Development will:	Indicative Criteria to Proceed to an Air Quality Assessment
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.
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.
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
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.
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
Have an underground car park with extraction system	The ventilation extract for the car park will be within 20m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out)

3.5 Air Quality Assessment

Impact Criteria

- 3.5.1 If the initial screening indicates that there is a potential risk of impact, guidance is provided also by EPUK & IAQM on how to determine the magnitude and the significance of any changes in air pollutant concentrations and/or exposure as a result of a proposed development.
- 3.5.2 This consists of the following steps:
- the magnitude of the change (% change of annual mean concentration);
 - the concentration relative to the Air Quality Strategy (AQS) objective (above or below the objective); and
 - the direction of change (adverse or beneficial).



- 3.5.3 The **magnitude of Impact** is described as shown below. This is based on the change in pollutant concentration resulting from the proposed development as a percentage of the Air Quality Action Level (AQAL) which in this case is NO₂ and PM₁₀ annual mean objective levels of 40 µg/m³.

Table 3-4 Impact Magnitude - Changes in NO₂ and PM₁₀ Concentrations

Change Magnitude	NO ₂ / PM ₁₀ Annual Mean	No. Days PM ₁₀ >µg/m ³
Large	Increase/decrease >10% (>4 µg/m ³)	Increase/decrease >4 days
Medium	Increase/decrease 6-10% (2.4 – 4 µg/m ³)	Increase/decrease 2-4 days
Small	Increase/decrease 2-5% (0.8-2 µg/m ³)	Increase/decrease 1-2 days
Imperceptible	Increase/decrease <1% (<0.4 µg/m ³)	Increase/decrease <1 day

- 3.5.4 The **significance of Impact** is dependent on the magnitude of change in relation to the relevant Air Quality Assessment Level (AQAL) as shown below.

Table 3-5 Impact Descriptors for Individual Receptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1%	2-5%	6-10%	>10%
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

- 3.5.5 Once the magnitude and the significance of the change has been established, the impact at each relevant receptor can be described. The impact magnitude at each receptor location can be described using the changes stated above as being of Imperceptible, Small, Medium or Large magnitude, or Negligible, Slight Moderate or Substantial significance and also as being either Temporary or Permanent.
- 3.5.6 The overall significance should be described separately for both the impact of emissions related to the proposed development on existing receptors, and for the impacts of emissions from existing source(s) on new exposure being introduced from the proposed development

Exposure Criteria

- 3.5.7 To determine the significance of exposure to air pollution and the level of mitigation required, consideration is given to the Air Pollution Exposure Criteria as set out in Table 3-6 below.
- 3.5.8 Both the impact and exposure criteria will be applied to the findings of this assessment, where required.



Table 3-6 Air Pollution Exposure Criteria

	Applicable Range	Applicable Range	Recommendation
	Nitrogen Dioxide Annual Mean	PM₁₀ Annual Mean	
APEC – A	> 5% below national objective	Annual Mean: > 5% below national objective 24 hr: > 1-day less than national objective	No air quality grounds for refusal; however, mitigation of any emissions should be considered.
APEC – B	Between 5% below or above national objective	Annual Mean: Between 5% above or below national objective 24 hr: Between 1-day above or below national objective.	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered e.g., Maximise distance from pollutant source, proven ventilation systems, parking considerations, winter gardens, internal layout considered, and internal pollutant emissions minimised.
APEC – C	> 5% above national objective	Annual Mean: > 5% above national objective 24 hr: > 1-day more than national objective.	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes of mitigation measures.



4 Baseline Conditions

4.1 Background Concentrations

Defra provides background pollution concentration estimates to assist local authorities undertake their 'Review and Assessment' work. This data is available to download from Defra air quality resource website¹¹ for NO_x, NO₂, PM₁₀ and PM_{2.5} for every 1 km X 1 km grid square for all local authorities. The current dataset is based on 2018 background data. The background dataset provides breakdown of pollution concentrations by different sources (both road and non-road sources). Table 4-1 presents the background concentrations for the study area for the year 2023 and 2024 (assumed periods of construction and occupation).

Table 4-1 Defra Background Concentrations (for all receptors)

Pollutant	2023 Concentration (µg/m ³)	2024 Concentration (µg/m ³)
NO_x	11.32	10.81
NO₂	8.74	8.36
PM₁₀	10.56	10.46
PM_{2.5}	6.61	6.53

Note: Data presented within the table are derived from the following ordinance survey grid square: 433500, 400500.

4.2 Air Quality Management Areas (AQMAs)

- 4.2.1 Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.
- 4.2.2 There are six areas that are currently designated as AQMA within Barnsley. These AQMAs have been declared for have been declared in relation to the AQOs of annual mean NO₂ and 1-hour mean NO₂ (AQMA #6 only). AQMAs in Barnsley are shown in Figure 4-1.
- 4.2.3 As indicated previously, the project site is within the Barnsley AQMA #1 (M1).
- 4.2.4 BMBC are in the process of revoking AQMA #5 at the junction of Burton Road and Rotherham Road, Monk Bretton

¹¹ <https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>

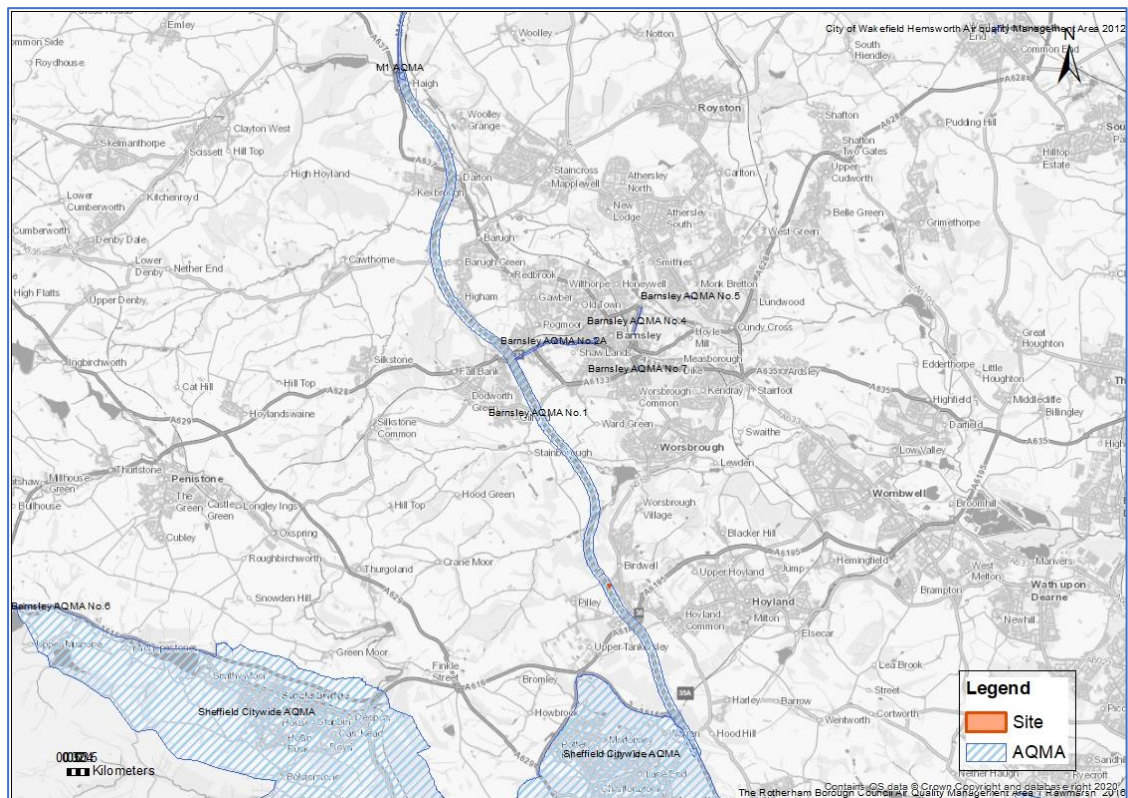


Figure 4-1 AQMAs near the Site

4.3 Existing Air Quality

4.3.1 The following sections sets out the baseline conditions in relation to air quality for the proposed development. Baseline air quality information is available from a number of sources including local and national monitoring data reports and websites. For the purpose of this assessment, data has been obtained from Barnsley Metropolitan Borough Council 's recent published 2021 Air Quality Status Report¹². All relevant air quality reports are available from the Council's website: <https://www.barnsley.gov.uk/services/pollution/air-pollution/air-quality/> <https://www.derby.gov.uk/trading-standards-environmental-health/environmental-health/environmental-protection/air-quality/>

4.3.2 Automatic Air Quality Monitoring Stations

4.3.3 Barnsley Council undertook automatic (continuous) monitoring at three sites during 2020. Table 4-2 shows the details of the automatic air quality monitoring stations. The [Air Quality England webpage](#) presents automatic monitoring results for Barnsley Council, with automatic monitoring results also available through the [UK-Air website](#).

4.3.4 Diffusion Tubes (DTs)

4.3.5 Barnsley Metropolitan Borough Council undertook non-automatic (i.e., passive) monitoring of NO₂ using diffusion tubes at 64 sites during 2020.

4.3.6 There is only one diffusion tube in the immediate vicinity of the project site, viz. DT30 (at The Walk, Birdwell) which is about 50m from the project site. DT31 and DT32 are within 500m of the site. Figure 4-2 shows the location of the diffusion tubes near the site. Table 4-3 provides the details of diffusion tube DT30, DT31 and DT32.

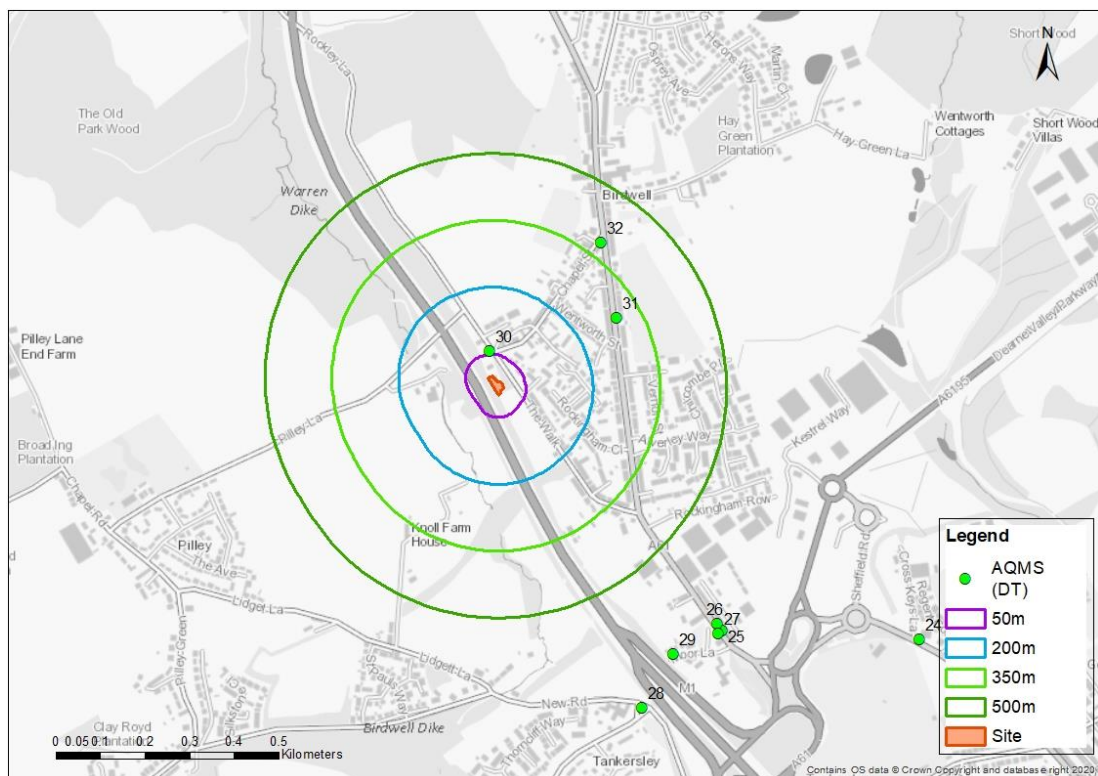


Figure 4-2 Location of Air Quality Monitoring Stations (Diffusion Tubes) near Project Site

Note: DT30, DT31 and DT32 are within 500m of the Site

¹² Barnsley Metropolitan Borough Council 2021 Air Quality Annual Status Report
<https://www.barnsley.gov.uk/media/19969/asrtemplateengland2021v20-1-barnsley-mbc.pdf>

4.3.7 Levels of NO₂

Table 4-4 provides the details of the annual mean NO₂ concentrations at the automatic air quality monitoring stations CM2 and CM3. Both sites have not exceeded the Annual Mean NO₂ AQO of 40 µg/m³ the last five years.

4.3.8 Table 4-5 provides the levels of annual mean NO₂ observed from 2016 to 2020 at the diffusion tube locations indicated in Section 4.3.4. Data from other diffusion tube stations are available in the Annual Status Report 2021. Figure 4-3 shows the annual mean NO₂ concentration at the diffusion tube locations DT30, DT31, DT32 and nearby DTs.

4.3.9 It is clear from Figure 4-3 and Table 4-5 that the **NO₂ levels near the project site are well below the annual mean AQO of 40 µg/m³**. The annual mean NO₂ at Dt30 in 2020 was 20.1 µg/m³. The annual average NO₂ at DT30 in the last five years has not exceeded the AQO of 40 µg/m³.

4.3.10 Table 4-6 shows the exceedance of 1-hour mean NO₂ values at the automatic stations CM2 and CM3. Both the stations did not breach the allowable limit of 18 exceedances.

4.3.11 As there are no NO₂ annual mean concentrations of more than 60 µg/m³ at the diffusion tubes near the site, it is likely that there are will not be any exceedances of the 1-hour mean objective for NO₂.

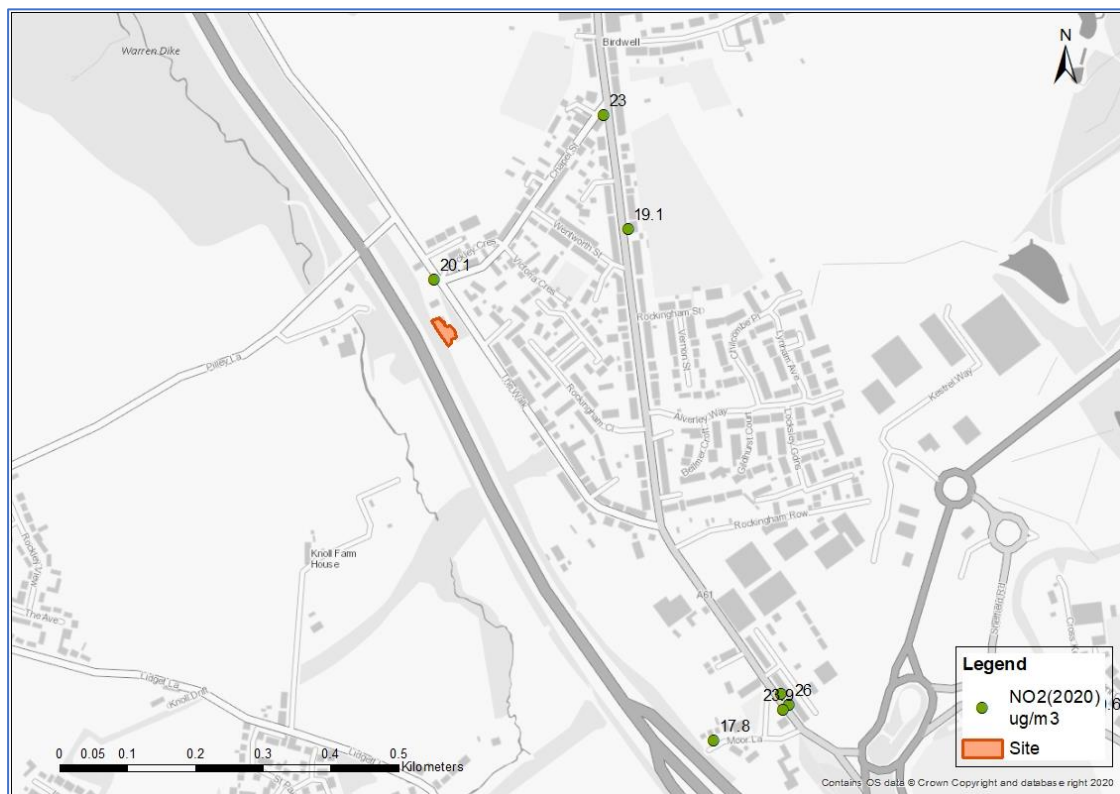


Figure 4-3 Annual Mean NO₂ Concentrations in 2020 at DT30, DT31, DT32 and nearby DTs



4.3.12 Levels of PM₁₀ and PM_{2.5}

- 4.3.13 The levels of PM₁₀ recorded at automatic site CM1 are shown in Table 4-7. It is clear from this table that PM₁₀ AQO of 40 µg/m³ was not exceeded in the last five years.
- 4.3.14 The Council does not monitor PM_{2.5}. It is very unlikely that the AQO for PM_{2.5} will be exceeded in the area.

4.4 Air Pollution Exposure Criteria and Mitigation

- 4.4.1 It is clear from the air quality data in Table 4-5 that the NO₂ levels at the diffusion tube nearest to the site (Dt30) in 2020 and in the previous four years were well below the AQO of 40 µg/m³. It is very likely that the project site will also meet the AQO for NO₂, thus, the residents of the new development will not be exposed to adverse NO₂ levels.
- 4.4.2 PM₁₀ levels are also reported to be well below the AQO of 40 µg/m³. It is thus assumed that the residents of the new development will not be exposed to adverse PM₁₀ levels.
- 4.4.3 Therefore, in accordance with the exposure criteria set out in Table 3-6 the site is likely to fall within APEC-A for site suitability.
- 4.4.4 APEC-A accommodation is: *"No air quality grounds for refusal; however, mitigation of any emissions should be considered"*.



Table 4-2 Details of the Automatic Monitoring Sites in BMBC

Site ID	Site Name	Coordinates		Site Type	In AQMA	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
		X	Y							
CM1	Barnsley A635 Roadside	436298	405691	Roadside	N	n/a	5	1.45	PM ₁₀	Beta Attenuation
CM2	Barnsley A628 Roadside	432680	406174	Roadside	Y	n/a	3.5	1.7	NO ₂	Chemiluminescent
CM3	Barnsley Gawber	432525	407475	Urban background	N	n/a	n/a	4	NO ₂ , SO ₂ , O ₃	Chemiluminescent, UV Fluorescence UV Absorption

Source: BMBC 2021 Air Quality Annual Status Report

Table 4-3 Diffusion Tubes DT30, DT31 and DT32 near the Site

DT21	22 Brixton Water Lane	X	Y	Site Type	Distance to Relevant Exposure (meters)	Distance to kerb (meters)	Inlet Height (meters)
30	The Walk, Birdwell	434309	401032	Roadside	0.0	n/a	2.6
31	Sheffield Rd – Birdwell	434595	401107	Roadside	3.5	2.5	3.0
32	Sheffield Rd Birdwell	434559	401274	Roadside	0.0	n/a	2.8

Source: BMBC 2021 Air Quality Annual Status Report

**Table 4-4 Annual Mean NO₂ at the Automatic Sites**

Site ID	Annual Mean Concentration (µg m ⁻³)				
	2016	2017	2018	2019	2020
CM2	36	35	32	32	25
CM3	19	16	16	17	12

Source: BMBC 2021 Air Quality Annual Status Report (Exceedances of AQO of 40 µg/m³, if any, are shown in **bold**)

Table 4-5 Annual Mean NO₂ (µg/m³) at Diffusion Tube Locations DT30, DT31 and DT32

Site ID	Location	2016	2017	2018	2019	2020
30	32.6	36.2	29.5	33.4	20.1	30
31	33.2	31.8	29.7	29.7	19.1	31
32	37.9	38.5	32.8	35.5	23.0	32

Source: BMBC 2021 Air Quality Annual Status Report (Exceedances of AQO of 40 µg/m³, if any, are shown in **bold**)

Table 4-6 1-Hour Mean NO₂ at the Automatic Site CM1, Number of 1-h mean >200 µg/m³

Site ID	Annual Mean Concentration (µg m ⁻³)				
	2016	2017	2018	2019	2020
CM2	2	4	0	0	0
CM3	0	0	0	0	0

Source: BMBC 2021 Air Quality Annual Status Report (exceedance >18, if any, are shown in **bold**)



Table 4-7 Annual Mean PM₁₀ at the Automatic Site CM1

Site ID	Annual Mean Concentration (µg m ⁻³)				
	2016	2017	2018	2019	2020
CM1	22	17	18	20	20

Source: BMBC 2021 Air Quality Annual Status Report. (Exceedances of AQO of 40 µg/m³, if any, are shown in **bold**)

5 Potential Impacts

5.1 Construction Phase Impacts - Air Quality Dust Risk Assessment

Air Quality Dust Risk Assessment (AQDRA) includes:

Risk assessment for each phase of works (earthworks, construction, trackout), incorporating the risk evaluation process set out below, and identifies suitable mitigation measures for the relevant level of risk.

AQDRA also identifies whether each phase of activity on-site represents a low, medium or high risk by following the IAQM Guidance¹³.

5.1.1 Step 1 – Need for a Detailed Assessment

Detailed assessment of the effects on ‘ecological receptors’ is not required as there are no ecological receptors within 50m of the boundary of the Site or within 50m of the routes used by the construction vehicles on the public highway up to 500m from the Site entrance.

Figure 5-1 shows the construction dust assessment study area based on the recommended distances by IAQM. Figure 5-1 shows buffer zones of 20m, 50m, 100m, 200m, 350m and 500m from the edge of the Site.

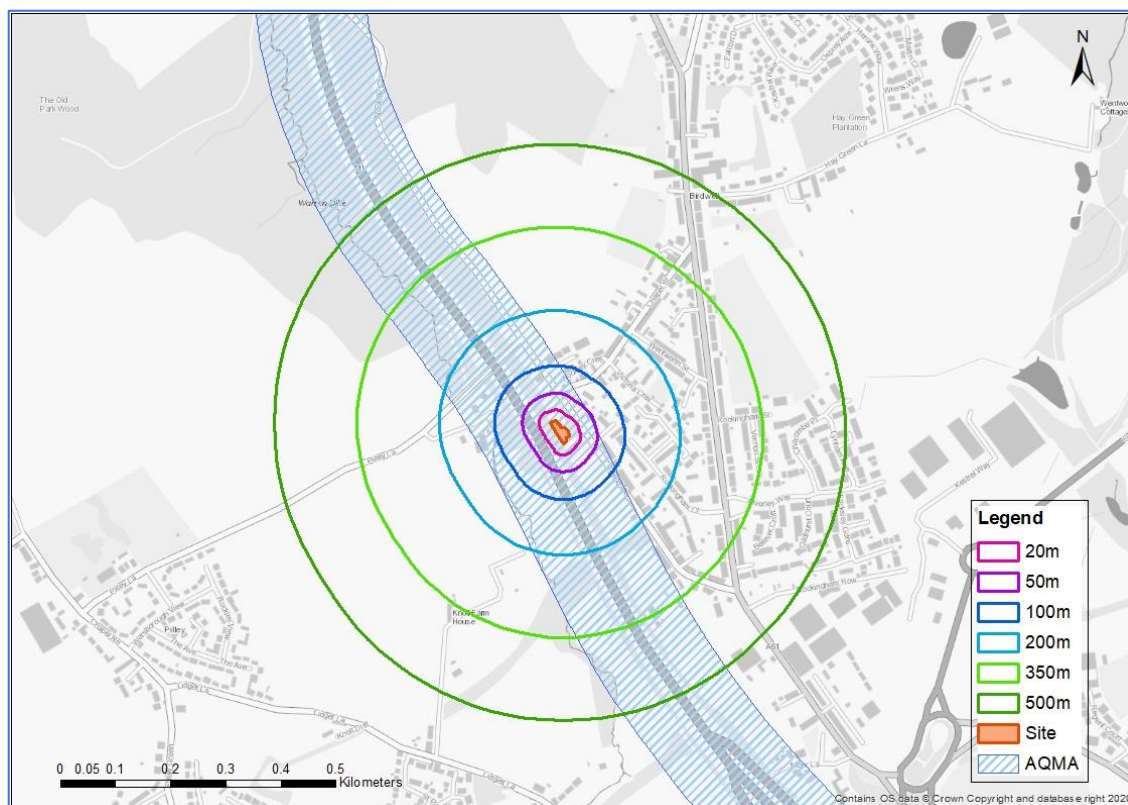


Figure 5-1 Construction Dust Risk Assessment Buffers

¹³ The Institute of Air Quality Management (2016): ‘Guidance on the Assessment of Dust from Demolition and Construction v1.1’



5.1.2 Construction Phase

5.1.3 For the purpose of this assessment, the earliest construction period is assumed to be 2023. The impacts from excavation, construction and track-out have been considered.

5.1.4 The project does not involve any demolition; hence demolition phase dust emission assessment has not been carried out in this report.

5.1.5 Due to the scale of the construction, it is estimated that there will be no HDV trips, but 2 vans per day during the construction phase of 14-16 weeks. This is treated as 1 HDV trip per day removing/bringing materials to the site on average.

Following sections describe various stages of the AQDRA for the proposed development.

5.1.6 Step 2 – Assessment of the Risk of Dust Impacts

This step considers the AQDRA for the construction and trackout phases of the development. It considers the potential effects of each development phase on the nearest receptors including:

- the risk of health effects from an increase in exposure to PM₁₀ and PM_{2.5}
- annoyance due to the deposition of dust; and
- harm to the natural environment.

5.1.7 Step 2A – Defining the Potential Dust Emission Magnitude

The dust emission magnitude is based on the scale of the anticipated works and is classified as Small, Medium, or Large.

Table 5-1 presents the potential dust emission magnitude based on project specific construction activities and is based on the IAQM Guidance criteria. As indicated earlier, the assessment does not include any demolition and earthwork; therefore, this has not been considered here.

Table 5-1 Dust Emission Magnitude

Activity Phase	Dust Emission Magnitude
Demolition	None
Earthworks	Small (Site area is 700 m ²)
Construction	Small (Total building volume <25,000 m ³ , GIA is 200 m ²)
Construction Traffic (Trackout)	Small (1 HDV of >3.5T per day)

5.1.8 Step 2B – Defining the Sensitivity of the Area

The sensitivity of the area takes account of a number of factors:

- The specific sensitivities of receptors in the area.
- The proximity and number of those receptors.
- In the case of PM₁₀, the local background concentration; and
- Site-specific factors, such as whether there are natural shelters, such as trees or other vegetation, to reduce the risk of wind-blown dust.



- 5.1.9 Type of receptors at different distances from the boundary of the Site has been considered and is based on a rough estimation using the Figure 5-1. The IAQM Guidance indicates that “*exact counting of ‘human receptors’ is not required. Instead, it is recommended that judgement is used to determine the receptors (a residential unit is one receptor) within each distance band*”.
- 5.1.10 Table 5-2 presents the sensitivity of receptors to effects caused by construction activities and is based on the criteria presented Tables 2, 3 and 4 of the IAQM Guidance. For this assessment, it is assumed that there are ‘High Sensitivity Receptors’ within the study area.
- 5.1.11 For dust soiling effects on property and people (earthwork and construction) it is estimated that the number of human receptors up to 100 m from site boundary are considered to be 10-100.
- 5.1.12 For dust soiling effects on property and people (trackout) it is estimated that the number of human receptors up to 100 m from site boundary and up to 50m distance from road centre line of trackout route) are considered to be 10 to 100.
- 5.1.13 For human health impacts (earthwork and construction) it is estimated that the number of human receptors within 100m from the site boundary are considered to be 10 to 100.
- 5.1.14 For human health impacts (trackout) it is estimated that the number of human receptors up to 50 m from site exit (<50m distance from road centre line of trackout route) are considered to be 10 to 100.
- 5.1.15 As indicated in Section 4.1 and Table 4-1, the annual mean PM₁₀ concentrations in 2023 in the grid 434300, 400500 is 10.56 µg/m³. This has been used to determine the sensitivity of the area to human health effects (Table 3 of the IAQM Guidance).

Table 5-2 Sensitivity of Study Area to Dust and Soiling Effects on People and Property

Potential Impact	Sensitivity of the surrounding area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Medium	Medium	Medium
Human Health	N/A	Low	Low	Low
Ecological	N/A	N/A	N/A	N/A

- 5.1.16 Step 2C – Defining the Risk of Impacts
- 5.1.17 The dust emission magnitude determined in STEP 2A is combined with the sensitivity of the area determined in STEP 2B to determine the risk of impacts with no mitigation applied.
- 5.1.18 Tables 6, 7, 8 and 9 of the IAQM Guidance have been used to determine the risk of each activity for this project. Table 5-3 provides the summary of the risk of construction and trackout phases of the development. The final risks presented in Table 5-3 have been used in the next section to determine the level of site-specific mitigation measures that will be applied to this development.

Table 5-3 Summary of the Risk of Construction Effects

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Low Risk	Low Risk	Negligible
Human Health	N/A	Negligible	Negligible	Negligible
Ecological	N/A	N/A	N/A	N/A



- 5.1.19 Based on the above, the largest risk associated with earthwork and construction activities is 'Low' with regard to dust soiling, and 'Negligible' with regard to human health. For trackout, the largest risk associated is 'Negligible' with regard to dust soiling, and 'Negligible' with regard to human health.
- 5.1.20 Overall, the impacts from disamenity dust and PM₁₀ from the demolition and construction phase of the proposed development are considered to be 'Negligible' with regard to human health and 'Low' with regard to the dust soiling. Mitigation measures are thus recommended for the highest risk, viz. '**Low**'.

5.2 Operational Phase Air Quality Assessment

Transport Emissions Assessment

- 5.2.1 The proposed development comprises only one residential unit, which is below the threshold of the criteria requiring a detailed air quality assessment for the operational phase (IAQM/EPUK Guidance).
- 5.2.2 The site will provide only **three parking spaces** hence the number of daily trips will be less than 10 per day. This is significantly lower than the IAQM/EPUK Guidance criteria of 100 AADT hence the impact of emissions from the vehicular trips generated by the development are insignificant.

5.3 Predicted Air Quality Near the Site

- 5.3.1 The site is within a declared Air Quality Management Area. The monitored air quality data near the site as shown in Section 4.3.7 indicate that the project site is highly likely to meet the recommended Air Quality Objectives (AQO) for NO₂ and PM₁₀. The nearest diffusion tube DT30 (50m from the site), has recorded annual mean NO₂ significantly below the AQO of 40 µg/m³ in the last five years, hence it is expected that the site will also meet the AQO for NO₂ (both annual mean and 1-hour)
- 5.3.2 Hence, it is concluded that the project site will meet the AQO for NO₂ and ***does not require any specific operational phase mitigation measures.***



6 Proposed Mitigation Measures

The dust risk categories for earthwork, construction and trackout activities determined in Section 5.1 have been used to define the appropriate, site-specific, mitigation measures to be adopted. The largest risk associated with earthwork and construction activities is 'Low' with regard to dust soiling, and 'Negligible' with regard to human health. For trackout, the largest risk associated is 'Negligible' with regard to dust soiling, and 'Negligible' with regard to human health. Overall, the impacts from disamenity dust and PM₁₀ from the construction phase of the proposed development are 'Negligible' with regard to human health and 'Low' with regard to the dust soiling.

Mitigation measures are thus recommended for the highest risk, viz. **'Low'**

The following mitigation measures are recommended for the construction phase:

6.1 Construction and Trackout Phases Mitigation Measures

Mitigation Measures Key

H = Highly recommended

D = Desirable

6.1.1 Site Management

6.1.1.1	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
6.1.1.2	Display the head or regional office contact information.	H
6.1.1.3	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 logbook.	H
6.1.1.4	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.	D
6.1.1.5	Make the complaints log available to the local authority when asked.	H
6.1.1.6	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 logbook.	
6.1.1.7	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 windowsills within 100 m of site boundary, with cleaning to be provided if necessary.	H
6.1.1.8	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

6.1.2 Preparing and Maintaining the Site

6.1.2.1	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H
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6.1.2.2	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H
6.1.2.3	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
6.1.2.4	Avoid site runoff of water or mud.	H
6.1.2.5	Keep site fencing, barriers and scaffolding clean using wet methods.	D
6.1.2.6	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.	D
6.1.2.7	Cover, seed or fence stockpiles to prevent wind whipping.	D

6.1.3 Operating Vehicle/Machinery and Sustainable Travel

6.1.3.1	Ensure all on-road vehicles comply with the requirements of the Low Emission Strategy.	H
6.1.3.2	Ensure all vehicles switch off engines when stationary - no idling vehicles.	H
6.1.3.3	Avoid the use of diesel- or petrol- powered generators and use mains electricity or battery powered equipment where practicable.	H
6.1.3.4	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas.	D

6.1.4 Operating Vehicle/Machinery and Sustainable Travel

6.1.4.1	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
6.1.4.2	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H
6.1.4.3	Use enclosed chutes and conveyors and covered skips.	H
6.1.4.4	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
6.1.4.5	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

6.1.5 Waste Management

6.1.5.1	Avoid bonfires and burning of waste materials.	H
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**6.1.6 Measures Specific to Construction**

6.1.6.1	Avoid scabbling (roughening of concrete surfaces) if possible.	D
6.1.6.2	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.	D

6.2 Operation Phase Mitigation Measures

- 6.2.1 The site is within a declared Air Quality Management Area. The monitored air quality data near the site as shown in Section 4.3.7 indicate that the project site is highly likely to meet the recommended Air Quality Objectives (AQO) for NO₂ and PM₁₀. The nearest diffusion tube DT30 (50m from the site), has recorded annual mean NO₂ significantly below the AQO of 40 µg/m³ in the last five years, hence it is expected that the site will also meet the AQO for NO₂ (both annual mean and 1-hour)
- 6.2.2 Hence, it is concluded that the project site will meet the AQO for NO₂ and ***does not require any specific operational phase mitigation measures***



7 Conclusions

- 7.1.1 This report provides an assessment on the following key impacts associated with the constructional and operational phase of the proposed development:
- Relevance to national, regional and local air quality and appropriate planning guidance
 - Establishment of the background air quality at the site and comparison with the National Air Quality Objectives (AQOs).
 - Assessment of the risk of dust impacts
 - The potential dust emission magnitude
 - The sensitivity of the area
 - The risk of impacts
 - Assessment of the air quality neutrality based on energy emissions and transport emissions
 - Recommendations for dust and emission control measures during construction and trackout phases.
 - Recommendation of mitigation measures to achieve the residential suitability of the new sensitive residential receptors.
- 7.1.2 A qualitative assessment of demolition, earthworks, construction and trackout dust effects has been undertaken for the proposed scheme. In summary, therefore, it can be concluded that the impact on air quality for the proposed building will not have a significant impact on local air quality, human health or sensitive habitat sites.
- 7.1.3 A qualitative assessment of construction and trackout dust effects has been undertaken for the proposed scheme. Based on this, the largest risk associated with earthwork and construction activities is 'Low' with regard to dust soiling, and 'Negligible' with regard to human health. For trackout, the largest risk associated is 'Negligible' with regard to dust soiling, and 'Negligible' with regard to human health. Overall, the impacts from disamenity dust and PM₁₀ from the construction phase of the proposed development are 'Negligible' with regard to human health and 'Low' with regard to the dust soiling
- 7.1.4 Based on The Institute of Air Quality Management (2016): 'Guidance on the Assessment of Dust from Demolition and Construction v1.1' **construction stage mitigation measures for the highest risk, viz. Low, have been recommended for 'Low Risk'** as indicated in Section 6.1.
- 7.1.5 The proposed development will provide three parking spaces. The site will generate number of trips which are significantly lower than the IAQM/EPUK Guidance criteria of 100 AADT hence the impact of emissions from the vehicular trips generated by the development are insignificant.
- 7.1.6 The monitored data suggest that the PM₁₀ and dNO₂ levels the new receptors will be exposed to, will be below the Air Quality Objectives. **This suggests that no mitigation measures are required for the operation phase** to protect the health of the residents (new receptors).
- 7.1.7 If the recommended mitigation measures during construction phase as indicated in Section 6.1 are implemented, this report concludes that the proposed development, will not conflict with any national, regional, or local planning policy.



8 Appendices

8.1 Appendix 1: Operational Impact Assessment Methodology

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

- The number of dwellings is 10 or above;
- The residential development is carried out of a site of more than 0.5ha where the number of dwellings is unknown;
- The provision of more than 1,000 m² commercial floorspace; or,
- Development carried out on land of 1ha or more.

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

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

The assessment process involves two stages where:

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

Table A1 sets out the Stage 1 criteria to determine the need to assess impacts arising from small developments and Table A2 provides more specific guidance as to when an air quality assessment is likely to be required to assess the impacts of the proposed development on the local area.

Table A1: Stage 1 Criteria to proceed to Stage 2

Criteria to Proceed to Stage 2	
A	If any of the following apply: • or more residential units of a site area of more than 0.5ha • More than 1,000m² of floor space for all other uses or a site area greater than 1ha
B	Coupled with any of the following: • The development has more than 10 parking spaces • The development will have a centralised energy facility or other centralised combustion process


Table A2: Indicative Criteria for Requiring an Air Quality Assessment

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



8.2 Appendix 2: Site Drawings

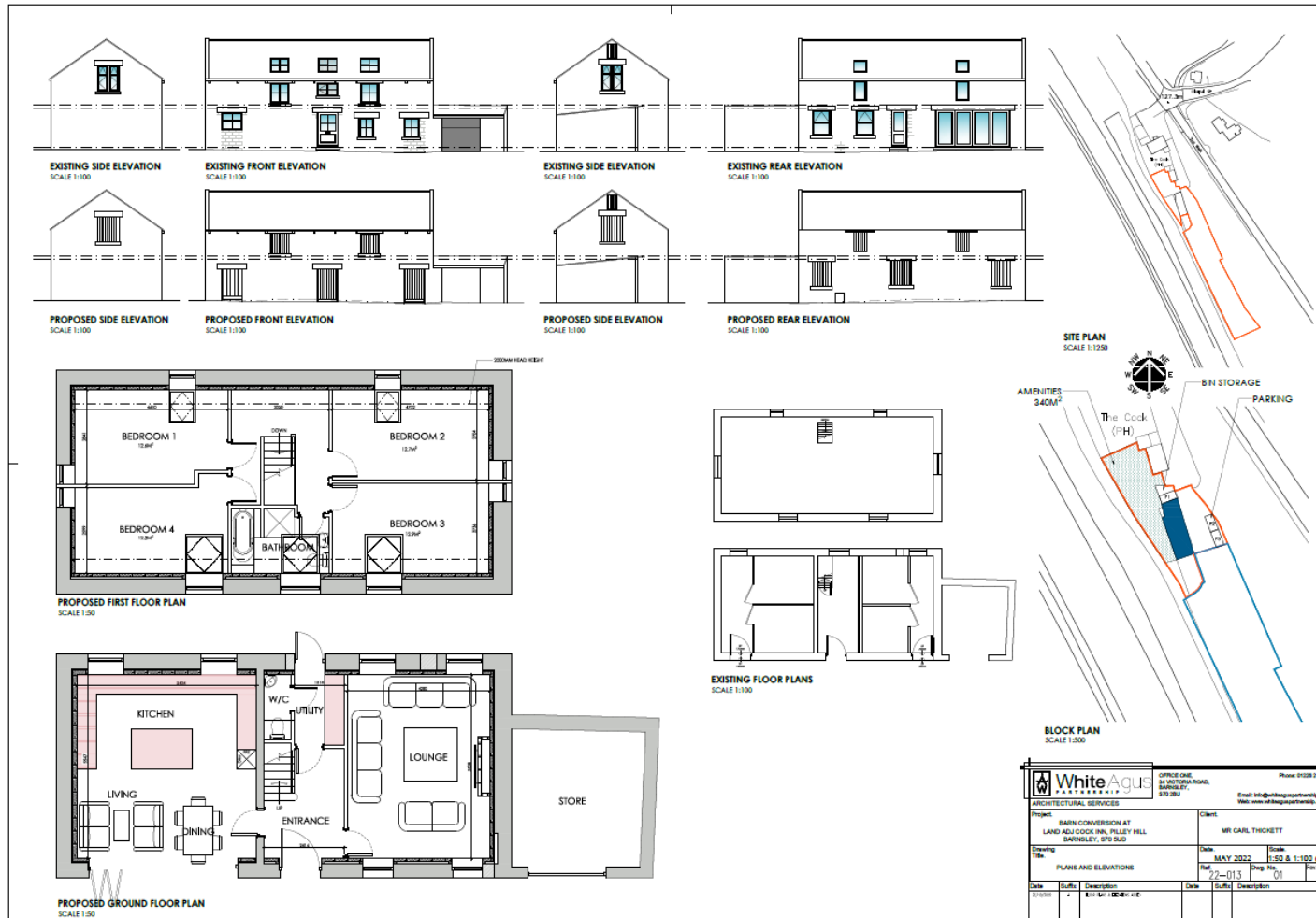


Figure 8-1 Proposed Site Layout