

Air Quality Assessment: Land at Cliff Hill, Denby Dale, Huddersfield

June 2022



Experts in air quality
management & assessment



Document Control

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Executive Summary

The air quality impacts associated with the proposed residential development on land at Cliff Hill, Denby Dale, in Huddersfield have been assessed. The development will comprise 47 residential dwellings with associated car parking.

The assessment has demonstrated that future residents of the proposed development will experience acceptable air quality, with pollutant concentrations below the air quality objectives.

The assessment has also demonstrated that the development-generated changes in traffic volumes on the local road network will be below published screening criteria, and thus there will be no significant effects at any existing, sensitive receptor.

Overall, the operational air quality effects of the proposed development are judged to be 'not significant'.

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1 Introduction

- 1.1 This report describes the potential air quality impacts associated with the proposed residential development on land at Cliff Hill, Denby Dale, in Huddersfield. The proposed development will consist of 47 residential dwellings with associated car parking.
- 1.2 The proposed development lies more than 10 km from the nearest Air Quality Management Area (AQMA), 'Kirklees AQMA 9', which has been declared by Kirklees Council for exceedances of the annual mean nitrogen dioxide (NO₂) objective. The proposed development will introduce new residential exposure; thus, an assessment is required to determine the air quality conditions that future residents will experience. It will also generate additional traffic on local roads, which may impact on air quality at existing residential properties along the affected road network. The main air pollutants of concern related to road traffic emissions are nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀ and PM_{2.5}).
- 1.3 The new homes within the proposed development will be provided with heat and hot water by individual gas boilers within each unit; there will be no centralised energy plant and thus no significant point sources of emissions within the proposed development.
- 1.4 Kirklees Council has adopted the West Yorkshire Low Emissions Strategy (WYLES) Group technical planning guidance on Air Quality and Emissions (WYLES Group, 2016). The proposed development includes 47 residential dwellings and will generate more than 100 two-way vehicle movements per day. Using the criteria stated in Table 1 of the guidance and 'Other' (detailed in the footnote of Table 1), the proposed development can be classified as a 'medium' development, and therefore, does not require a construction dust risk assessment and an emissions damage costs calculation to be undertaken.
- 1.5 This report describes existing local air quality conditions (base year 2019) and considers air quality conditions at the proposed development in 2023, which is the anticipated first year of occupation. It has been prepared taking into account all relevant local and national guidance and regulations.

2 Policy Context

- 2.1 All European legislation referred to in this report is written into UK law and remains in place.

Air Quality Strategy

- 2.2 The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role. The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an Air Quality Management Area (AQMA), and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

Clean Air Strategy 2019

- 2.3 The Clean Air Strategy (Defra, 2019) sets out a wide range of actions by which the UK Government will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

Reducing Emissions from Road Transport: Road to Zero Strategy

- 2.4 The Office for Low Emission Vehicles (OLEV) and Department for Transport (DfT) published a Policy Paper (DfT, 2018) in July 2018 outlining how the government will support the transition to zero tailpipe emission road transport and reduce tailpipe emissions from conventional vehicles during the transition. This paper affirms the Government's pledge to end the sale of new conventional petrol and diesel cars and vans by 2040, and states that the Government expects the majority of new cars and vans sold to be 100% zero tailpipe emission and all new cars and vans to have significant zero tailpipe emission capability by this year, and that by 2050 almost every car and van should have zero tailpipe emissions. It states that the Government wants to see at least 50%, and as many as 70%, of new car sales, and up to 40% of new van sales, being ultra-low emission by 2030.
- 2.5 The paper sets out a number of measures by which Government will support this transition but is clear that Government expects this transition to be industry and consumer led. The Government has since announced that the phase-out date for the sale of new petrol and diesel cars and vans will

be brought forward to 2030 and that all new cars and vans must be fully zero emission at the tailpipe from 2035. If these ambitions are realised then road traffic-related NO_x emissions can be expected to reduce significantly over the coming decades, likely beyond the scale of reductions forecast in the tools utilised in carrying out this air quality assessment.

Environment Act 2021

- 2.6 The UK's new legal framework for protection of the natural environment, the Environment Act (2021) passed into UK law in November 2021. The Act gives the Government the power to set long-term, legally binding environmental targets. It also establishes an Office for Environmental Protection (OEP), responsible for holding the government to account and ensuring compliance with these targets.
- 2.7 The Act requires the government to set at least one long-term target (spanning a minimum of 15 years), supported by interim targets set in a five year cycle, in each of four identified areas: Air Quality, Biodiversity, Water and Resource Efficiency and Waste Reduction. An additional target for mean levels of PM_{2.5} is also required. These must be set before November 2022. As the targets have not yet been either finalised or adopted by the Government, they cannot impact on current planning policy.

Planning Policy

National Policies

- 2.8 The National Planning Policy Framework (NPPF) (2021) sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, and that the planning system has three overarching objectives, one of which (Paragraph 8c) is an environmental objective:

“to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy”.

- 2.9 To prevent unacceptable risks from air pollution, Paragraph 174 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 quality”.

- 2.10 Paragraph 185 states:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development”.

2.11 More specifically on air quality, Paragraph 186 makes clear 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”.

2.12 The NPPF is supported by Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019), which includes guiding principles on how planning can take account of the impacts of new development on air quality. The PPG states that:

“Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified”.

2.13 Regarding plan-making, the PPG states:

“It is important to take into account air quality management areas, Clean Air Zones and other areas including sensitive habitats or designated sites of importance for biodiversity where there could be specific requirements or limitations on new development because of air quality”.

2.14 The role of the local authorities through the LAQM regime is covered, with the PPG stating that a local authority Air Quality Action Plan *“identifies measures that will be introduced in pursuit of the objectives and can have implications for planning”*. In addition, the PPG makes clear that *“...dust can also be a planning concern, for example, because of the effect on local amenity”*.

2.15 Regarding the need for an air quality assessment, the PPG states that:

“Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to 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”.

- 2.16 The PPG sets out the information that may be required in an air quality assessment, making clear that:

“Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific”.

- 2.17 The PPG also provides guidance on options for mitigating air quality impacts, as well as examples of the types of measures to be considered. It makes clear that:

“Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact. It is important that local planning authorities work with applicants to consider appropriate mitigation so as to ensure new development is appropriate for its location and unacceptable risks are prevented”.

Local Policies

- 2.18 The Kirklees Council Local Plan (Kirklees Council, 2019) was adopted in February 2019, and covers the period between 2013 and 2031. The Local Plan includes the following policies relevant to air quality:

- 2.19 Policy LP15, ‘Residential use in town centres’, states that:

“Proposals for residential uses (including student accommodation) within the defined town centres as set out on the Policies Map will be supported subject to:

...d. the protection of the amenity of existing residents and future occupiers of the proposed residential use in accordance with amenity and design policies within the plan, and will in particular consider matters such as privacy, noise and air quality...”

- 2.20 Policy LP20, ‘Sustainable travel’, states that:

“New development will be located in accordance with the spatial development strategy to ensure the need to travel is reduced and that essential travel needs can be met by forms of sustainable transport other than the private car. The council will support development proposals that can be served by alternative modes of transport such as public transport, cycling and walking and in the case of new residential development is located close to local facilities or incorporates opportunities for day to day activities on site...”

The council will support demand management measures which discourage single occupancy car travel within new development and encourage the use of low emission vehicles to improve areas with low levels of air quality...”

2.21 Policy LP21, 'Highways and access', states that:

"Proposals shall demonstrate that they can accommodate sustainable modes of transport and be assessed effectively and safely by all users.

New development will normally be permitted where safe and suitable access to the site can be achieved for all people and where the residual cumulative impacts of development are not severe.

...

All proposals shall:

...c. be accompanied by a supporting Transport Assessment or Transport Statement where the development would generate significant trip generation, providing detail as to the impact on highway safety, air quality..."

2.22 Policy LP47, 'Healthy, active and safe lifestyles', states that:

"The council will, with its partners, create an environment which supports healthy, active and safe communities and reduces inequality.

Healthy, active and safe lifestyles will be enabled by:

...g. ensuring that the current air quality in the district is monitored and maintained and, where required, appropriate mitigation measures include as part of new development proposals..."

2.23 Policy LP51, 'Protection and improvement of local air quality', which states:

"1. Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air pollution which would have an unacceptable impact on the natural and built environment or to people.

2. Proposals that have the potential to increase local air pollution either individually or cumulatively must be accompanied by evidence to show that the impact of the development has been assessed in accordance with the relevant guidance. Development which has the potential to cause levels of local air pollution to increase must incorporate sustainable mitigation measures that reduce the level of this impact. If sustainable measures cannot be introduced the development will not be permitted.

3. Where the development introduces new receptors into Air Quality Management Areas or Areas of Concern or near other areas of relatively poor air quality, for example near roads or junctions, the development must incorporate sustainable mitigation measures that protect the new receptors from unacceptable levels of air pollution. Where sustainable mitigation measures cannot be introduced which prevent receptors from being exposed to unsafe levels of air pollution, development will not be permitted."

Building Standards

- 2.24 Part F (1) of the Building Regulations 2010 (Ministry of Housing, Communities & Local Government, 2020) places a duty on building owners, or those responsible for relevant building work¹, to ensure adequate ventilation is provided to building occupants. Compliance with the Building Regulations is not required for planning approval, but it is assumed that the Regulations will be complied with in the completed building.
- 2.25 Approved Document F, which accompanies the Building Regulations, explains that care should be taken to minimise entry of external air pollutants. The versions of Approved Document F which apply from 15 June 2022 explain that specific steps should be taken to manage ventilation intakes where the building is near to a significant source of emissions, or if local ambient concentrations exceed values set in the Air Quality Standards Regulations 2010 (see Paragraph 3.4, later). These steps include maximising the distance between emission source and air intake, considering likely dispersion patterns, and considering the timing of pollution releases when designing the ventilation system.

Air Quality Action Plans

National Air Quality Plan

- 2.26 Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide concentrations in the UK (Defra, 2017); a supplement to the 2017 Plan (Defra, 2018) was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. Alongside a package of national measures, the 2017 Plan and the 2018 Supplement require those identified English Local Authorities (or the GLA in the case of London Authorities) to produce local action plans and/or feasibility studies. These plans and feasibility studies must have regard to measures to achieve the statutory limit values within the shortest possible time, which may include the implementation of a CAZ. There is currently no straightforward way to take account of the effects of the 2017 Plan or 2018 Supplement in this assessment; however, consideration has been given to whether there is currently, or is likely to be in the future, a limit value exceedance in the vicinity of the proposed development. This assessment has principally been carried out in relation to the air quality objectives, rather than the limit values that are the focus of the Air Quality Plan.

Local Air Quality Action Plan

- 2.27 Kirklees Council's Air Quality Action Plan (Kirklees Council, 2019) sets out a series of measures by which they will seek to achieve the air quality objectives and improve air quality in Kirklees between

¹ Building work is a legal term for work covered by the Building Regulations. With limited exemptions, the Regulations apply to all significant building work, including erecting or extending a building.

April 2019 and March 2024. None of the policies are especially relevant to this assessment, being focussed on locations outside of the assessment study area or being general in nature and applying for all of Kirklees.

3 Assessment Criteria

- 3.1 The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations (2002).
- 3.2 The UK-wide objectives for nitrogen dioxide and PM₁₀ were to have been achieved by 2005 and 2004 respectively and continue to apply in all future years thereafter. The PM_{2.5} objective was to be achieved by 2020. Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m³ (Defra, 2021). Therefore, 1-hour nitrogen dioxide concentrations will only be considered if the annual mean concentration is above this level.
- 3.3 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Defra explains where these objectives will apply in its Local Air Quality Management Technical Guidance (Defra, 2021). The annual mean objectives for nitrogen dioxide and PM₁₀ are considered to apply at the façades of residential properties, schools, hospitals etc.; they do not apply at hotels. The 24-hour mean objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels. The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.
- 3.4 EU Directive 2008/50/EC (The European Parliament and the Council of the European Union, 2008) sets limit values for nitrogen dioxide, PM₁₀ and PM_{2.5}, and is implemented in UK law through the Air Quality Standards Regulations (2010)². The limit values for NO₂ and PM₁₀ are the same numerical concentrations as the UK objectives, whilst the limit value for is 20 µg/m³. Achievement of the limit values is a national obligation rather than a local one. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values. Central Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded, unless such studies have been audited and approved by Defra and DfT's Joint Air Quality Unit (JAQU).

² As amended through The Air Quality Standards (Amendment) Regulations 2016 and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.

3.5 The relevant air quality criteria for this assessment are provided in Table 1.

Table 1: Air Quality Criteria for Nitrogen Dioxide, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Objective
Nitrogen Dioxide	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
PM ₁₀	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³
PM _{2.5} ^a	Annual Mean	25 µg/m ³

^a The PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

3.6 In March 2022, Defra began consultation on new targets for PM_{2.5} concentrations in England. One proposed target is to achieve PM_{2.5} concentration of 10 µg/m³ at relevant national monitoring sites by 2040. This would be accompanied by a target to reduce overall population exposure to PM_{2.5}, which will be assessed by national government using its own measurements. If adopted, these targets will apply to national government; it is not yet clear how these will apply to local government and, as such, are not considered further in this assessment.

Screening Criteria for Road Traffic Assessments

3.7 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM)³ recommend a two-stage screening approach (Moorcroft and Barrowcliffe et al, 2017) to determine whether emissions from road traffic generated by a development have the potential for significant air quality impacts. The approach, as described in Appendix A1, first considers the size and parking provision of a development; if the development is residential and is for fewer than ten homes or covers less than 0.5 ha, or is non-residential and will provide less than 1,000 m² of floor space or cover a site area of less than 1 ha, and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment.

3.8 The second stage then compares the changes in vehicle flows on local roads that a development will lead to against specified screening criteria. The screening thresholds (described in full in Appendix A1) inside an AQMA are a change in flows of more than 25 heavy duty vehicles or 100 light duty vehicles per day; outside of an AQMA the thresholds are 100 heavy duty vehicles or 500 light duty vehicles. Where these criteria are exceeded, a detailed assessment is likely to be required, although the guidance advises that *“the criteria provided are precautionary and should be treated as indicative”*, and *“it may be appropriate to amend them on the basis of professional judgement”*.

³ The IAQM is the professional body for air quality practitioners in the UK.

4 Assessment Approach

Existing Conditions

4.1 Existing sources of emissions and baseline air quality conditions within the study area have been defined using a number of approaches:

- industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register (Defra, 2022a);
- local sources have been identified through examination of the Council's Air Quality Review and Assessment reports;
- information on existing air quality has been obtained by collating the results of monitoring carried out by the local authority;
- background concentrations have been defined using Defra's 2018-based background maps (Defra, 2022d). These cover the whole of the UK on a 1x1 km grid. The background annual mean nitrogen dioxide maps for 2019 have been calibrated against concurrent measurements from national monitoring sites (AQC, 2020). The calibration factor calculated has also been applied to future year backgrounds. Mapped background concentrations of PM₁₀ and PM_{2.5} have not been adjusted; and
- whether or not there are any exceedances of the annual mean limit value for nitrogen dioxide in the study area has been identified using the maps of roadside concentrations published by Defra (2020) (2022b). These are the maps used by the UK Government, together with the results from national Automatic Urban and Rural Network (AURN) monitoring sites that operate to the required data quality standards, to identify and report exceedances of the limit value. The national maps of roadside PM₁₀ and PM_{2.5} concentrations (Defra, 2022b), which are available for the years 2009 to 2019, show no exceedances of the limit values anywhere in the UK in 2019.

Road Traffic Impacts

4.2 The first step in considering the road traffic impacts of the proposed development has been to screen the development and its traffic generation against the criteria set out in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017), as described in Paragraph 3.8 and detailed further in Appendix A1. Where impacts can be screened out there is no need to progress to a more detailed assessment.

Impact of Existing Sources on Future Residents of the Development

4.3 The impacts of concentrations of NO₂, PM₁₀ and PM_{2.5} on new residents of the proposed development have assessed qualitatively. The assessment considers air quality conditions across

the site taking account of local air quality monitoring data, background pollutant concentrations and proximity to local road traffic.

- 4.4 The assessment examines air quality conditions in 2019 and assumes these are representative of air quality conditions at the time the development is occupied; this assumption is considered to be worst-case as it is generally expected that NO₂, PM₁₀ and PM_{2.5} concentrations will decline in future years.

Assessment of Operational Significance

- 4.5 There is no official guidance in the UK in relation to development control on how to assess the significance of air quality impacts. The approach developed jointly by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) has therefore been used. The overall significance of the air quality impacts is determined using professional judgement; the experience of the consultants preparing the report is set out in Appendix A2. Full details of the EPUK/IAQM approach are provided in Appendix A1.

5 Baseline Conditions

Relevant Features

- 5.1 The proposed development is located in Denby Dale village, in Kirklees, in a predominantly residential area, with agricultural fields to the north, Cumberworth Lane to the west and Leak Hall Road to the east. It currently comprises agricultural land.

Industrial sources

- 5.2 No significant industrial or waste management sources have been identified that are likely to affect the proposed development, in terms of air quality.

Odour and Dust Sources

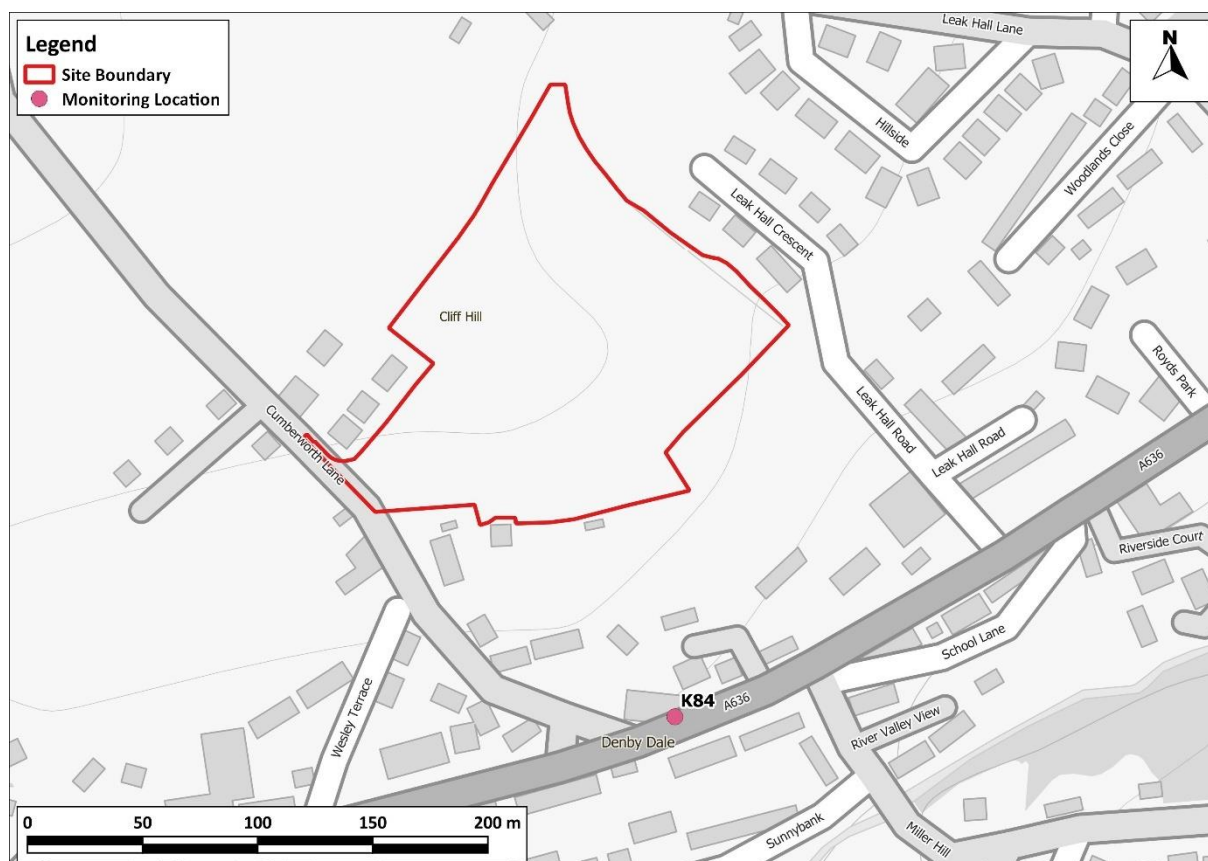
- 5.3 No significant odour or dust sources have been identified in the near vicinity of the proposed development that could lead to any adverse impacts on future residents.

Local Air Quality Monitoring

- 5.4 Kirklees Council operates two automatic monitoring stations within its area, both of which are located more than 10 km away from the proposed development and as such measured concentrations at these sites are not considered representative of conditions at the application site. The Council also operates a number of nitrogen dioxide monitoring sites using diffusion tubes prepared and analysed by West Yorkshire Analytical Services (using the 50% TEA in acetone method), with one diffusion tube monitoring site (ID: 'K84') located approximately 100 m from the proposed development.
- 5.5 Annual mean results for the years 2018 to 2020 are summarised in Table 2. The monitoring locations are shown in Figure 1. The monitoring data have been taken from Kirklees Council's 2021 Annual Status Report (Kirklees Council, 2021).

Table 2: Summary of Annual Mean NO₂ Monitoring (2018-2020) (µg/m³)

Site ID	Site Type	Location	2018	2019	2020
K84	Roadside	Denby Dale	28.4	20.6	18.6
Objective			40		

**Figure 1: Monitoring Location and the Application Site Boundary**

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- 5.6 As seen in Table 2, no exceedances have been measured at the 'K84' diffusion tube monitoring site between 2018 and 2020.
- 5.7 While 2020 results have been presented in this Section for completeness, they are not relied upon in any way as they will not be representative of 'typical' air quality conditions due to the considerable impact of the Covid-19 pandemic on traffic volumes and thus pollutant concentrations.
- 5.8 Kirklees Council does undertake PM₁₀ monitoring; however, as aforementioned in Paragraph 5.4 both stations are located more than 10 km away from the proposed development, and as such,

concentrations measured at these sites are not considered representative of conditions at the application site. Kirklees Council does not undertake any PM_{2.5} monitoring.

Exceedances of Limit Value

- 5.9 There are no AURN (Defra, 2022c) monitoring sites within 1 km of the application site with which to identify exceedances of the annual mean nitrogen dioxide limit value. Defra's roadside annual mean nitrogen dioxide concentrations (Defra, 2022b), which are used to identify and report exceedances of the limit value, do not identify any exceedances within 1 km of the application site in 2019. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the proposed development by the time that it is operational.
- 5.10 As discussed in Paragraph 2.26, Defra has produced an Air Quality Plan (Defra, 2017) to tackle roadside nitrogen dioxide concentrations in the UK. Within this Plan, Kirklees Council is identified as having limit value exceedances in or beyond 2017, but not beyond 2020, thus the Plan does not require the authority to undertake any further action. However, a High Court judgement (Royal Courts of Justice, 2018) declared the Plan unlawful with regard to its application to the 45 local authority areas in which exceedances were projected beyond 2017, but not beyond 2020. The judgement required the 33 local authorities where exceedances were projected beyond 2018, of which Kirklees Council is one, to also "*develop and implement a plan designed to deliver compliance in the shortest time possible*". Kirklees Council is on this list due to exceedances of the limit value being identified alongside Gelderd Road (A62), which is located over 17 km from the proposed development, thus future limit value exceedances are unlikely to be affected by the proposed development. This local action plan may improve air quality within the study area.

Background Concentrations

- 5.11 Estimated background concentrations at the proposed development are set out in Table 3 and are all well below the objectives.

Table 3: Estimated Annual Mean Background Pollutant Concentrations in 2019 and 2023 (µg/m³)

Year	NO ₂	PM ₁₀	PM _{2.5}
2019	9.6	11.7	6.5
2023	8.4	11.1	6.1
Objective	40	40	25 ^a

^a The 25 µg/m³ PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

6 Impact Assessment

Impacts at Existing Receptors

- 6.1 Via Solutions, the appointed transport consultant for this scheme, have advised that the proposed development is expected to generate a total of 220 daily Light Duty Vehicles (LDVs) and two Heavy Duty Vehicles (HDVs); these daily trip rates are below the screening threshold of 500 LDVs and 100 HDVs, as an Annual Average Daily Traffic (AADT) flow, recommended for use outside of an AQMA in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017) (see Paragraph 3.7). As such, it is judged that the relevant screening thresholds will not be exceeded and there is no requirement for a detailed assessment of road traffic impacts at existing receptors; it can be concluded that the proposed development will not have a significant impact on local roadside air quality.

Impacts of Existing Sources on Future Residents of the Development

- 6.2 As discussed in the Baseline Conditions section, no specific sources of dust, odour or emissions have been identified near to the site.
- 6.3 The proposed development is located well away from any busy roads, with the nearest major road (Wakefield Road (A636)) located greater than 50 m from the application site. Defra's Technical Guidance (LAQM.TG16) states that "*concentrations fall-off rapidly on moving away from the source*" and defines urban background locations as those that are distanced 50 m from major sources of pollution (i.e., car tailpipe emissions) (Defra, 2021). Given the distance of the proposed development away from any major sources, it is anticipated that pollutant concentrations at the site will be lower than those measured at Wakefield Road (presented in Table 2) and similar to the background concentrations presented in Table 3, which are well below the air quality objectives.
- 6.4 As such, it can be concluded that future occupants of the proposed development will experience acceptable air quality.

Significance of Operational Air Quality Effects

- 6.5 The operational air quality effects without mitigation are judged to be 'not significant'. This professional judgement is made in accordance with the methodology set out in Appendix A1, and takes account of the assessment that:
- the Proposed Development is identified as 'medium' in accordance with the West Yorkshire Low Emissions Strategy (WYLES) Group technical planning guidance on Air Quality and Emissions (WYLES Group, 2016);
 - pollutant concentrations within the proposed development will all be below the objectives, thus future residents will experience acceptable air quality;
 - no specific sources of dust, odour or emissions have been identified near to the site; and

- the trip generation of the proposed development will be below the published EPUK/IAQM screening criteria, and thus it will not have a significant impact on local roadside air quality.

7 Mitigation

Good Design and Best Practice

7.1 The EPUK/IAQM guidance advises that good design and best practice measures should be considered whether or not more specific mitigation is required. The proposed development incorporates the following good design and best practice measures, which have been accounted for in the assessment as far as is possible:

- setting back of the development buildings from the nearest road (Cumberworth Lane) by at least 11 m;
- electric vehicle charging points for every new dwelling;
- provision of a detailed travel plan setting out measures to encourage sustainable means of transport (public, cycling and walking); and
- provision of two new pedestrian crossings over Cumberworth Lane to encourage walking; and
- provision for cycle parking.

Recommended Mitigation

- 7.2 The assessment has demonstrated that the overall air quality effect of the proposed development will be 'not significant'. It is, therefore, not considered appropriate to propose further mitigation measures for this development.
- 7.3 Measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European legislation (which is written into UK law).

8 Conclusions

- 8.1 Air quality conditions for future residents of the proposed development have been shown to be acceptable, with concentrations well below the air quality objectives throughout the site.
- 8.2 The assessment has demonstrated that the incremental changes to traffic flows on the local road network will be below published screening thresholds, and each dwelling will be provided with an individual gas boiler. The proposed development will not therefore generate any significant emissions, and impacts on local air quality will be insignificant.
- 8.3 The overall air quality effects of the proposed development are judged to be 'not significant'.
- 8.4 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 185 of the NPPF, being appropriate for its location both in terms of its effects on the local air quality environment and the air quality conditions for future residents. It is also consistent with Paragraph 186, as it will not affect compliance with relevant limit values or national objectives.
- 8.5 The proposed development is also consistent with 'Policy LP51' of the Local Plan as it will likely not result, directly or indirectly, in an increase in air pollution in the near vicinity.

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10 Glossary

AADT	Annual Average Daily Traffic
AQAL	Air Quality Assessment Level
AQC	Air Quality Consultants
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
Defra	Department for Environment, Food and Rural Affairs
EPUK	Environmental Protection UK
EU	European Union
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles (<3.5 tonnes)
µg/m³	Microgrammes per cubic metre
NO₂	Nitrogen dioxide
NPPF	National Planning Policy Framework
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
OLEV	Office for Low Emission Vehicles
PM₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM_{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
PPG	Planning Practice Guidance
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TEA	Triethanolamine – used to absorb nitrogen dioxide

11 Appendices

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A1 EPUK & IAQM Planning for Air Quality Guidance

- A1.1 The guidance issued by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) is comprehensive in its explanation of the place of air quality in the planning regime. Key sections of the guidance not already mentioned above are set out below.

Air Quality as a Material Consideration

“Any air quality issue that relates to land use and its development is capable of being a material planning consideration. The weight, however, given to air quality in making a planning application decision, in addition to the policies in the local plan, will depend on such factors as:

- *the severity of the impacts on air quality;*
- *the air quality in the area surrounding the proposed development;*
- *the likely use of the development, i.e. the length of time people are likely to be exposed at that location; and*
- *the positive benefits provided through other material considerations”.*

Recommended Best Practice

- A1.2 The guidance goes into detail on how all development proposals can and should adopt good design principles that reduce emissions and contribute to better air quality management. It states:

“The basic concept is that good practice to reduce emissions and exposure is incorporated into all developments at the outset, at a scale commensurate with the emissions”.

- A1.3 The guidance sets out a number of good practice principles that should be applied to all developments that:

- include 10 or more dwellings;
- where the number of dwellings is not known, residential development is carried out on a site of more than 0.5 ha;
- provide more than 1,000 m² of commercial floorspace;
- are carried out on land of 1 ha or more.

- A1.4 The good practice principles are that:

- New developments should not contravene the Council's Air Quality Action Plan, or render any of the measures unworkable;
- Wherever possible, new developments should not create a new “street canyon”, as this inhibits pollution dispersion;

- Delivering sustainable development should be the key theme of any application;
- New development should be designed to minimise public exposure to pollution sources, e.g. by locating habitable rooms away from busy roads;
- The provision of at least 1 Electric Vehicle (EV) “rapid charge” point per 10 residential dwellings and/or 1000 m² of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made available;
- Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety;
- All gas-fired boilers to meet a minimum standard of <40 mgNO_x/kWh;
- Where emissions are likely to impact on an AQMA, all gas-fired CHP plant to meet a minimum emissions standard of:
 - Spark ignition engine: 250 mgNO_x/Nm³;
 - Compression ignition engine: 400 mgNO_x/Nm³;
 - Gas turbine: 50 mgNO_x/Nm³.
- A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of 275 mgNO_x/Nm³ and 25 mgPM/Nm³.

A1.5 The guidance also outlines that offsetting emissions might be used as a mitigation measure for a proposed development. However, it states that:

“It is important that obligations to include offsetting are proportional to the nature and scale of development proposed and the level of concern about air quality; such offsetting can be based on a quantification of the emissions associated with the development. These emissions can be assigned a value, based on the “damage cost approach” used by Defra, and then applied as an indicator of the level of offsetting required, or as a financial obligation on the developer. Unless some form of benchmarking is applied, it is impractical to include building emissions in this approach, but if the boiler and CHP emissions are consistent with the standards as described above then this is not essential”.

A1.6 The guidance offers a widely used approach for quantifying costs associated with pollutant emissions from transport. It also outlines the following typical measures that may be considered to offset emissions, stating that measures to offset emissions may also be applied as post assessment mitigation:

- Support and promotion of car clubs;
- Contributions to low emission vehicle refuelling infrastructure;
- Provision of incentives for the uptake of low emission vehicles;
- Financial support to low emission public transport options; and
- Improvements to cycling and walking infrastructures.

Screening

Impacts of the Local Area on the Development

“There may be a requirement to carry out an air quality assessment for the impacts of the local area’s emissions on the proposed development itself, to assess the exposure that residents or users might experience. This will need to be a matter of judgement and should take into account:

- 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 Air Quality Management Areas 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 nitrogen dioxide), 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”.*

Impacts of the Development on the Local Area

A1.7 The guidance sets out two stages of screening criteria that can be used to identify whether a detailed air quality assessment is required, in terms of the impact of the development on the local area. The first stage is that you should proceed to the second stage if any of the following apply:

- 10 or more residential units or a site area of more than 0.5 ha residential use; and/or
- more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha.

A1.8 Coupled with any of the following:

- the development has more than 10 parking spaces; and/or
- the development will have a centralised energy facility or other centralised combustion process.

A1.9 If the above do not apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area. If they do apply then you proceed to stage 2, which sets out indicative criteria for requiring an air quality assessment. The stage 2 criteria relating to vehicle emissions are set out below:

- the development will lead to a change in LDV flows of more than 100 AADT within or adjacent to an AQMA or more than 500 AADT elsewhere;
- the development will lead to a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;
- the development will lead to a realigning of 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;
- the development will introduce a new junction or remove an existing junction near to relevant receptors, and the junction will cause traffic to significantly change vehicle acceleration/deceleration, e.g. traffic lights or roundabouts;
- the development will introduce or change a bus station where bus flows will change by more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere; and
- the development will have an underground car park with more than 100 movements per day (total in and out) with an extraction system that exhausts within 20 m of a relevant receptor.

A1.10 The criteria are more stringent where the traffic impacts may arise on roads where concentrations are close to the objective. The presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate.

A1.11 On combustion processes (including standby emergency generators and shipping) where there is a risk of impacts at relevant receptors, the guidance states that:

“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. 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.

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”.

- A1.12 Should none of the above apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area, provided that professional judgement is applied; the guidance importantly states the following:

“The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive ‘trigger’ for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality”.

- A1.13 Even if a development cannot be screened out, the guidance is clear that a detailed assessment is not necessarily required:

“The use of a Simple Assessment may be appropriate, where it will clearly suffice for the purposes of reaching a conclusion on the significance of effects on local air quality. The principle underlying this guidance is that any assessment should provide enough evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality. A Simple Assessment will be appropriate, if it can provide this evidence. Similarly, it may be possible to conduct a quantitative assessment that does not require the use of a dispersion model run on a computer”.

- A1.14 The guidance also outlines what the content of the air quality assessment should include, and this has been adhered to in the production of this report.

Assessment of Significance

- A1.15 There is no official guidance in the UK in relation to development control on how to describe the nature of air quality impacts, nor how to assess their significance. The approach within the EPUK/IAQM guidance has, therefore, been used in this assessment. This approach involves a two stage process:

- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
- a judgement on the overall significance of the effects of any impacts.

- A1.16 The guidance recommends that the assessment of significance should be based on professional judgement, with the overall air quality impact of the development described as either ‘significant’ or ‘not significant’. In drawing this conclusion, the following factors should be taken into account:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts;
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts;
- the potential for cumulative impacts and, in such circumstances, several impacts that are described as '*slight*' individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a '*moderate*' or '*substantial*' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health; and
- the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals.

A1.17 The guidance is clear that other factors may be relevant in individual cases. It also states that the effect on the residents of any new development where the air quality is such that an air quality objective is not met will be judged as significant. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.

A1.18 A judgement of the significance should be made by a competent professional who is suitably qualified. A summary of the professional experience of the staff contributing to this assessment is provided in Appendix A2.

A2 Professional Experience

Penny Wilson, BSc (Hons) CSci MEnvSc MIAQM

Ms Wilson is an Associate Director with AQC, with more than 20 years' relevant experience in the field of air quality. She has been responsible for numerous assessments for a range of infrastructure developments including power stations, road schemes, ports, airports and residential/commercial developments. The assessments have covered operational and construction impacts, including odours. She also provides services to local authorities in support of their LAQM duties, including the preparation of Review and Assessment and Action Plan reports, as well as audits of Air Quality Assessments submitted with planning applications. She has provided expert evidence to a number of Public Inquiries and is a Member of the Institute of Air Quality Management and a Chartered Scientist.

Martin Peirce, BSc (Hons) MSc MEnvSc MIAQM

Mr Peirce is an Associate Director with AQC, with more than 30 years' experience in environmental modelling and assessment, most relating to air quality and carbon and greenhouse gases (GHGs). He has extensive experience in the calculation of emissions to air and compiling emission inventories, for both local air quality assessments and carbon footprinting. He also has extensive expertise in modelling the atmospheric dispersion of pollutants for comparison against regulatory limits and for assessment of health and environmental impacts. He has prepared assessments in support of Environmental Impact Assessments (EIA), permit applications and planning applications (under both Town and Country Planning Act (TCPA) and Development Consent Order (DCO) regimes). He has particular experience in modelling aviation and transport sources, non-road mobile machinery, construction and industrial sources.

George Chousos, BSc MSc AMEnvSc AMIAQM

Mr Chousos is a Consultant with AQC, having joined in May 2019. Prior to joining AQC, he completed an MSc in Air Pollution Management and Control at the University of Birmingham, specialising in air pollution control technologies and management, and data processing using R. He also holds a degree in Environmental Geoscience from the University of Cardiff, where he undertook a year in industry working in the field of photo-catalytic technology. He is now gaining experience in the field of air quality monitoring and assessment.