Air Quality Constraints Assessment:

Land off Bolney Road, Ansty

September 2023

Experts in air quality management & assessment

Document Control

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1 Introduction

1.1 This report provides a review of baseline air quality information available for the area surrounding a site proposed for residential development, on land off Bolney Road, in Ansty, Mid Sussex ("the site"). This assessment has been carried out to identify any potential air quality constraints to the development of the site for the proposed use, and the potential for significant air quality effects in the surrounding area.

1.2 The assessment considers the following:

- existing baseline air quality conditions, including:
  - identification of nearby major sources of air pollution;
  - a review of Mid Sussex District Council's (MSDC's) most recently available Air Quality Progress Report;
  - identification of nearby Air Quality Management Areas (AQMAs);
  - identification of nearby relevant air quality monitoring; and
  - identification of background concentrations.
- identification of the potential air quality constraints associated with the proposed development of the land for residential use, taking account of the baseline conditions;
- identification of the potential significant effects brought about as a result of the proposed development, taking account of baseline conditions and the scale of the development; and
- a summary overview.

2 Baseline Air Quality

Site Description

2.1 The site is located off Bolney Road (A272), in Ansty, and is bordered by Bolney Road (A272) and residential properties to the north and west, Marwick Close and residential properties to the east and agricultural fields to the south. The site currently comprises agricultural land. The location of the proposed development is shown in Figure 1.

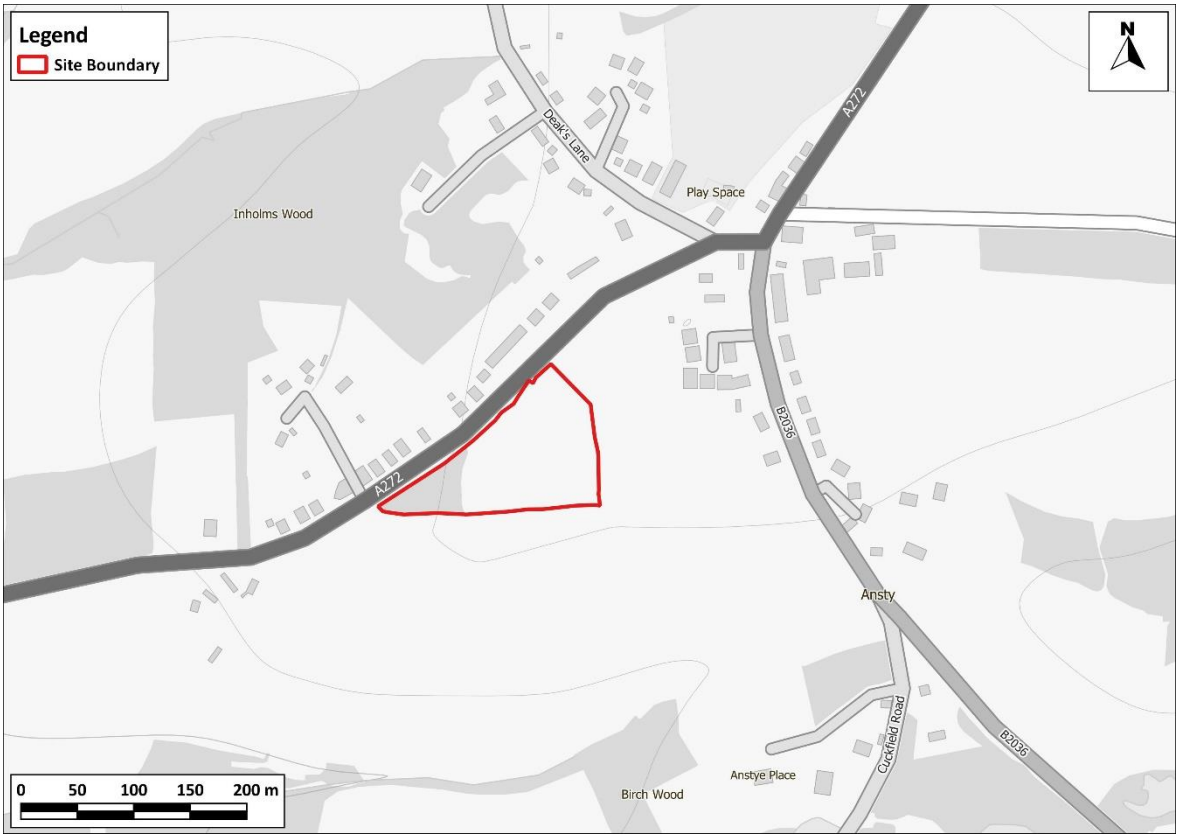

Figure 1: Proposed Development Location

Industrial sources

2.2 A search of the UK Pollutant Release and Transfer Register (Defra, 2023a) has not identified any significant industrial or waste management sources that are likely to affect the site in terms of air quality.

Air Quality Review and Assessment

2.3 MSDC has investigated air quality within its area as part of its responsibilities under the Local Air Quality Management (LAQM) regime. The Council has declared one AQMA in its area, *'Mid Sussex AQMA No.1'*, located approximately 7.6 km to the south of the site in Hassocks.

Local Air Quality Monitoring

2.4 MSDC operates a number of nitrogen dioxide (NO_2) monitoring sites using diffusion tubes prepared and analysed by Gradko (using the 20% TEA[1] in water method), including four monitoring sites within 4 km of the site.

2.5 Available data for the years 2017 to 2021 have been taken from the MSDC's 2022 Air Quality Progress Report (Mid Sussex District Council, 2022), and are summarised in Table 1.

Table 1: Summary of Annual Mean NO_2 Monitoring (2017-2021) (µg/m^3)

Site ID	Site Type	Location	2017	2018	2019	2020	2021
MSAQ9	Rural	Water Tower, Colwood Lane, Warninglid	9.0	9.0	8.5	6.1	6.1
MSAQ21	Roadside	London Road, Burgess Hill	29.5	29.0	27.6	21.0	24.0
MASQ27	Suburban	Telegraph Pole, London Road, Hickstead	20.5	22.8	19.3	13.6	14.7
MSAQ32	Roadside	Lamp Post Woodcroft Burgess Hill	-	-	13.7	11.2	11.4
Objective [a]			**40**				

[a] Information on the National Air Quality Objectives and where they apply is provided in the Appendix.

2.6 The data confirm that concentrations have remained well below the annual mean nitrogen dioxide objective between 2017 and 2021. In addition, as all measured concentrations were below 60 µg/m^3, the 1-hour objective is unlikely to have been exceeded.

2.7 While 2020 and 2021 results have been presented for completeness, they are not relied upon in any way as they will not be representative of 'typical' air quality conditions due to the impact of the Covid-19 pandemic on traffic volumes and thus pollutant concentrations.

2.8 No monitoring of PM_{10} or $PM_{2.5}$ concentrations is undertaken in MSDC.

[1] Triethanolamine – a chemical used to absorb nitrogen dioxide.

Figure 2: Monitoring Sites and the Site Boundary

Exceedances of EU Limit Values

2.9 There are no AURN (Defra, 2023b) monitoring sites within 1 km of the site with which to identify exceedances of the annual mean nitrogen dioxide limit value. Defra's roadside annual mean nitrogen dioxide concentrations (Defra, 2023c), which are used to identify and report exceedances of the limit value, do not identify any exceedances within 1 km of the site in 2023. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the site by the time that it is operational.

Background Concentrations

2.10 Estimated background concentrations for 2023 at the proposed development, derived from Defra's background maps (Defra, 2022a) are set out in Table 2. The background concentrations, which represent the air quality conditions away from specific sources of pollution, are all well below the objectives. The anticipated year of opening of the proposed development is not known at this stage; background concentrations have therefore been presented for 2023, which provides a conservative assessment, as concentrations are expected to reduce in future years.

Table 2: Estimated Annual Mean Background Pollutant Concentrations in 2019 (µg/m^3)

Year	NO_2	PM_{10}	$PM_{2.5}$
2023	7.7	12.8	8.4
Objectives	**40**	**40**	**20** [a]

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

3 Local Planning Policy

3.1 The Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018) was adopted in March 2018 and includes policy DP29, 'Noise, Air and Light Pollution', which refers to air quality:

"…The environment, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where:

…

Air Pollution:

- *It does not cause unacceptable levels of air pollution;*
- *Development on land adjacent to an existing use which generates air pollution or odour would not cause any adverse effects on the proposed development or can be mitigated to reduce exposure to poor air quality to recognized and acceptable levels;*
- *Development proposals (where appropriate) are consistent with Air Quality Management Plans…"*

3.2 MSDC, as part of the Sussex-air partnership, has produced an Air Quality and Emissions Mitigation Guidance for Sussex document (Sussex-air Partnership, 2021), which aims to minimise the impacts new developments may have on local air quality. This document will be used to inform the air quality assessment submitted as part of the planning application.

4 Air Quality Constraints

Impacts on Future Residents of the Proposed Development

4.1 A search of the UK Pollutant Release and Transfer Register (Defra, 2023a) has not identified any significant industrial or waste management sources that are likely to affect air quality at the site, in terms of air quality. Examination of recent Air Quality Progress Reports revealed no relevant sources of pollution which might affect air quality at the site.

4.2 The site is located to the south of Bolney Road (A272), which experienced a flow of approximately 15,000 vehicles per day (as an Annual Average Daily Traffic (AADT) flow) in 2019 (DfT, 2022). Monitoring site 'MSAQ21' is located within 2.5 m of the kerbside of London Road (B2036), which experienced a traffic flow of approximately 12,200 AADT in 2019. Measured concentrations at the 'MSAQ21' diffusion tube have been well below the annual mean nitrogen dioxide objective in all recent years (Table 1). The dwellings within the site are anticipated to be set back approximately 22 m from Bolney Road (A272). Based on this set-back distance, and the local monitoring shown in Table 1, concentrations within the site are expected to be well below the relevant objectives.

4.3 No monitoring of PM_{10} or $PM_{2.5}$ concentration is undertaken in MSDC, however, based on the set-back distance between the proposed dwellings and Bolney Road, it is expected that concentrations will be approaching background concentrations, which are well below the objectives (Table 2).

4.4 It is generally expected that nitrogen dioxide, PM_{10} and $PM_{2.5}$ concentrations will decline in future years as a result of local and national measures. It is therefore expected that concentrations across the proposed development site will be well below the relevant objectives, and that there will not be any need for mitigation to make the site acceptable for future residential development.

Impacts of the Proposed Development

4.5 Dust generated during the construction of the proposed development may impact on air quality at existing properties. There are existing residential properties to the north and east of the site. In the context of a construction dust assessment, these are considered high sensitivity receptors. However, it can be assumed that best practice mitigation measures would be implemented through a Construction Environmental Management Plan during construction. With appropriate measures in place, air quality effects on existing properties during construction will be 'not significant'.

4.6 The proposed development will generate additional traffic on the local road network, which could impact upon air quality at existing residential properties. The main air pollutants of concern related to traffic emissions are nitrogen dioxide and fine particulate matter (PM_{10} and $PM_{2.5}$). The first step in considering the road traffic impacts of a proposed development is to screen the development and its traffic generation against the criteria set out in the guidance provided by Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) (Moorcroft and Barrowcliffe et al,

2017). The criteria state that for locations outside of an AQMA, the impact of additional traffic emissions can be judged to be insignificant where:

- the development will lead to a change in light duty vehicle (LDV) flows of less than 500 AADT; and
- the development will lead to a change in heavy duty vehicle (HDV) flows of less than 100 AADT.

4.7 The development-generated traffic is not currently known, and further assessment will be required to determine the impacts of the development traffic on local air quality at existing sensitive receptors. Taking account of the size of the proposed development, it is considered highly unlikely that the traffic generated will exceed these criteria, and therefore it is expected that the impact on nearby residential properties will not be significant. Detailed modelling will, however, be carried out to confirm this if the change in traffic on any road exceeds the criteria described above.

4.8 In addition, consideration may need to be given to the impact of additional traffic emissions on designated ecological sites in the vicinity of the proposed development that are within 200 m of the affected road network. These may include the following Ancient Woodland (AW) sites (Figure 3):

- Butlers Wood;
- Church Wood;
- Foxashes Wood;
- Highbridge Mill;
- Inholms Wood;
- Lowfield Wood;
- Pickwell Shaw;
- Pickwell Wood;
- Pond Wood; and
- Several Wood.

4.9 The final list of sites to be assessed will be determined once the traffic data are available, based on the increase in traffic flows on roads within 200 m of the nearby sites, and in discussion with the project ecologist and MSDC. The principal pollutants of concern with regard to traffic emissions and the impact on air quality at AW sites are nitrogen oxides (NOx), ammonia (NH_3) and nutrient nitrogen deposition.

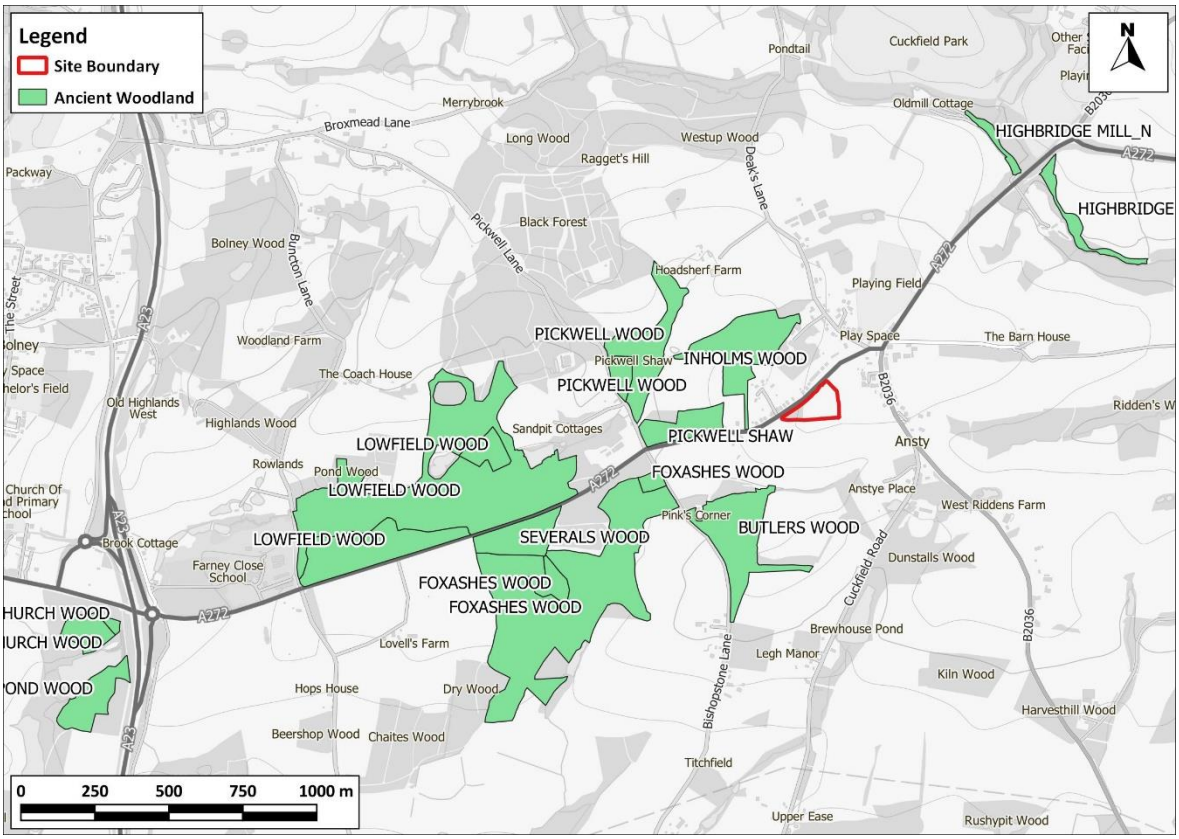

Figure 3: Designated Ecological Sites Close to the Proposed Development

5 Summary Overview

5.1 The air quality constraints for the proposed residential development of land off Bolney Road, in Ansty have been considered.

5.2 Based on local monitoring data, pollutant concentrations at the site are expected to be well below the relevant objectives; air quality for future residents will, therefore, be acceptable.

5.3 During construction, the proposed development will generate dust. With appropriate mitigation in place, construction dust impacts will not be significant. A construction dust risk assessment may be required at the planning application stage to determine the appropriate level of mitigation to be applied.

5.4 The proposed development will generate additional traffic on the local road network. Whilst the precise level of traffic generation is not currently known, taking account of the size of the proposed development and the existing good air quality in the vicinity of the site, the impacts at nearby existing residential properties are unlikely to have a significant effect. In addition, the impacts of the development-generated traffic emissions on the nearby designated ecological sites may also need to be considered.

5.5 Based on the above and taking account of relevant local policies relating to air quality, there is judged to be no reason, from an air quality perspective, why the site should not be allocated for residential development.

6 Appendix – National Air Quality Objectives

6.1 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).

6.2 The UK-wide objectives for nitrogen dioxide and PM_{10} 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/m^3 (Defra, 2022b). Measurements have also shown that the 24-hour mean PM_{10} objective could be exceeded at roadside locations where the annual mean concentration is above 32 µg/m^3 (Defra, 2022b).

6.3 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, 2022b). The annual mean objectives for nitrogen dioxide and PM_{10} 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 PM_{10} 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.

6.4 For $PM_{2.5}$, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value (see Paragraph 6.9), originally set at 25 µg/m^3 and currently set at 20 µg/m^3.

6.5 Defra has also recently set two new targets, and two new interim targets, for $PM_{2.5}$ concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean $PM_{2.5}$ concentration of 10 µg/m^3 by the end of 2040, with the interim target being a value of 12 µg/m^3 by the start of 2028[2]. The second set of targets relate to reducing overall

[2] Meaning that it will be assessed using measurements from 2027. The 2040 target will be assessed using measurements from 2040. National targets are assessed against concentrations expressed to the nearest whole number, for example a concentration of 10.4 µg/m^3 would not exceed the 10 µg/m^3 target.

population exposure to $PM_{2.5}$. By the end of 2040, overall population exposure to $PM_{2.5}$ should be reduced by 35% compared with 2018 levels, with the interim target being a reduction of 22% by the start of 2028.

6.6 Defra will assess compliance with the population exposure targets by averaging concentrations measured at its own background monitoring stations. This will not consider small changes over time to precisely where people are exposed (such as would relate to exposure introduced by a new development). Furthermore, all four new targets provide metrics against which central Government can assess its own progress. While local authorities have an important role delivering the required improvements, these are expected to relate to controlling emissions and not to directly assessing $PM_{2.5}$ concentrations against the targets.

6.7 In March 2023, the Department for Levelling Up, Housing and Communities (DLUHC, 2023) explained that the new $PM_{2.5}$ targets will:

"need to be integrated into the planning system, and in setting out planning guidance for local authorities and businesses, we will consider the specific characteristics of $PM_{2.5}$. The guidance will be forthcoming in due course, until then we expect local authorities to continue to assess local air quality impacts in accordance with existing guidance."

6.8 For the time being, therefore, no assessment is required, and indeed no robust assessment is possible, in relation to the new $PM_{2.5}$ targets and they are not considered in this constraints assessment.

6.9 EU Directive 2008/50/EC (The European Parliament and the Council of the European Union, 2008) sets limit values for nitrogen dioxide, PM_{10} and $PM_{2.5}$, and is implemented in UK law through the Air Quality Standards Regulations (2010)[3]. The limit values for nitrogen dioxide and PM_{10} are the same numerical concentrations as the UK objectives, whilst the limit value for $PM_{2.5}$ is 20 µg/m^3. 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).

6.10 The relevant air quality criteria for this assessment are provided in Table 3.

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

Table 3: Air Quality Criteria for Nitrogen Dioxide, PM_{10} 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
$PM_{2.5}$	Annual Mean	20 µg/m^3 [a]

[a] There is no numerical $PM_{2.5}$ objective for local authorities (see Paragraph 6.4). Convention is to assess against the UK limit value which is currently 20 µg/m^3.

7 References

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