Environmental Statement – Air Quality Chapter

Introduction

This chapter of the Environmental Statement prepared by Ensafe Consultants, reports the likely significant effects of the Proposed Development in terms of Air Quality in the context of the Site and surrounding area.

In particular it considers the likely significant effects of the construction and operational phases of the development on nearby sensitive receptors along the network and within with the West Oxfordshire District Council (WODC) Air Quality Management Area (AQMA) as well as likely pollutant exposure of future site users.

This chapter provides an update from the previously submitted Air Quality Assessment (Ref. AQ108164). Since the submission of the previous assessment the majority of the data and toolkits utilised throughout the assessment procedure have been amended and updated. Amendments to predicted background pollutant concentrations and emission factors produced by DEFRA, as well as updated monitored pollutant concentrations undertaken by the WODC may also have implications on the findings of the previous assessment.

Legislative Framework and Guidance

European Legislative Framework

The applicable legislative framework is summarised as follows:

- European Union (EU) Directive 2008/50/EC;

National Planning Policy

- The National Planning Policy Framework (NPPF), updated on 19th February 2019);
- The National Planning Practice Guidance (NPPG), relevant chapters produced on 1st November 2019;

UK Legislative Framework

- The Air Quality Standards (Amendment) Regulations (2016)[1];
- Section 82 of the Environment Act (1995) (Part IV); and
- Air Quality Strategy (AQS) 2007

National Guidance

The applicable guidance is summarised as follows:

- Local Air Quality Management Technical Guidance 2016 LAQM(TG16), DEFRA, 2016[2;]
- Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management (IAQM), v1.1, June 2016[3]; and
- Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and IAQM, January 2017[4].

1 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007
2 Local Air Quality Management Technical Guidance 2016 LAQM (TG16), DEFRA, February 2018.
3 Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management, 2016.
4 Land-Use Planning and Development Control: Planning for Air Quality, EPUK and IAQM, January 2017.

As shown below in Table 1 Air Quality Objectives (AQOs) detailed within the relevant legislation, which will be considered further during the preparation of the Air Quality chapter.

Table 1 Air Quality Objective

Pollutant	**Air Quality Objective**	
	Concentration ($\mu g/m^3$)	**Average period**
NO_2	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM_{10}	40	Annual mean
	50	24-hour mean; not to be exceeded more than 35 times a year
$PM_{2.5}$	25	Annual mean

The advice provided in DEFRA guidance LAQM (TG16)[2] on where the AQOs for pollutants considered within this report apply and is shown in Table 2.

Table 2 Examples of Where the Air Quality Objectives Apply

Average Period	**Objectives Should Apply At**	**Objectives Should Not Apply At**
Annual Mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24 – Hour Mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1 – Hour Mean	All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might	Kerbside sites where the public would not be expected to have regular access

Average Period	Objectives Should Apply At	Objectives Should Not Apply At
	reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	

Local Planning Guidance

The West Oxfordshire Local Plan 2031 was adopted by West Oxfordshire District Council (WODC) in September 2018. The document sets out the overall planning framework for the district until 2031. A review of the Core Strategy indicated the following policies in relation to air quality that are relevant to this assessment:

- **Policy T1: Sustainable Transport**

Priority will be given to locating new development in areas with convenient access to a good range of services and facilities and where the need to travel by private car can be minimised, due to opportunities for walking, cycling and the use of public transport, particularly where this would help to reduce traffic congestion on the routes around the Air Quality Management Area at Witney."

- **Policy EH8: Environmental Protection**

Proposals which are likely to cause pollution or result in exposure to sources of pollution or risk to safety, will only be permitted if measures can be implemented to minimise pollution and risk to a level that provides a high standard of protection for health, environmental quality and amenity. The following issues require particular attention:

  - *Air quality: The air quality within West Oxfordshire will be managed and improved in line with National Air Quality Standards, the principles of best practice and the Air Quality Management Area Action Plans for Witney."*

Scope of the Assessment

Due to the scale of the Proposed Development, there is the potential for impacts to arise at nearby sensitive receptors during the construction and operational phases. These may include fugitive dust emissions generated by construction activities, as well as additional road vehicle exhaust emissions generated during operation.

Methodology

The method of baseline data collection and assessment is in accordance with current guidance and industry best practice. Full details are provided in Appendix D. The methodology is split into the following two main sections:

- Construction Phase assessment
- Operational Phase assessment

Construction Phase Assessment

There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the

Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction'[3].

Activities on the Site have been divided into four types to reflect their different potential impacts. These are:

- Demolition
- Earthworks;
- Construction; and
- Trackout.

The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to a significant increase in exposure to PM_{10}.

To assess the risk of potential dust impacts, A site is allocated to a risk category based on two factors:

- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large; and
- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity.

The two factors are combined to determine the risk and significance of dust impacts without mitigation applied.

Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant' in EIA terms. This has been described as negligible within this report to provide continuity between assessment terminologies.

The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts as detailed within Appendix D .

Construction Phase Traffic Assessment

Based on the details of the Proposed Development and anticipated construction phase trip generation a screening assessment in accordance with the EPUK and IAQM guidance[4] was determined a suitable assessment approach. The assessment will determine construction road traffic exhaust emission impacts associated with the Proposed Development, and confirm the requirement for detailed assessment work.

The EPUK and IAQM document states the following criteria to help establish when an air quality assessment is likely to be considered necessary:

- Proposals that will cause a change in Light Duty Vehicle (LDV) flows of more than 500 AADT;
- Proposals that will cause a change in Heavy Duty Vehicle (HDV) flows of more than 100 AADT;

Should the above criteria not be met, the EPUK and IAQM document considers air quality impacts associated with the scheme to be not significant and no further assessment is required. Conversely, should the criterion be exceeded it may be deemed necessary that further assessment is required.

Operational Phase Assessment

The Proposed Development is located within the Witney AQMA, as such, the proposals have the potential to introduce new receptors into an area of existing poor air quality, as well as to cause impacts upon existing pollution levels at nearby sensitive receptors within the AQMA.

Detailed dispersion modelling was therefore undertaken to quantify Nitrogen Dioxide (NO_2), pollutant exposure across the site and determine suitability for the proposed use. The following modelling scenarios were utilised during the assessment:

- **2019 as Baseline year** for verification against latest ratified data;
- **2024 Opening year do-minimum (DM)** (predicted traffic flows in 2024 should the proposals not proceed)
- **2024 Opening year do-something (DS**) (predicted traffic flows in 2024 should the proposals be completed, with the additional traffic generated from the proposed development)
- **2031 Future year do-minimum (DM)** (predicted traffic flows in 2031 should the proposals not proceed, with the inclusion of the Full delivery of Witney SDA)
- **2031 Future year do-something (DS)** (predicted traffic flows in 2031 should the proposals be completed, with the inclusion of the Full delivery of Witney SDA and the additional traffic generated from the proposed development)

It should be noted that air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2019 were utilised within the dispersion model for future year scenarios. The use of 2024 traffic data and 2019 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

All traffic provided within this assessment has been based on information provided by the local highway authority, Oxford County Council (OCC).

For the purpose of this assessment, the 2024 Opening Year scenario includes committed development but excludes the Local Plan allocations. Transport infrastructure/highway improvements have not been considered in the analysis as this would result in slightly lower baseline flows and consequently a robust case has been considered.

Additionally, the 2031 Future year scenario with the full Local Plan delivered has been assessed in accordance to highways data provided by OCC. This scenario indicates that highway infrastructure projects will more than offset the anticipated cumulative traffic increases of the committed and planned development in the local area.

The above approach is considered to provide a robust approach. Further information regarding the traffic modelling is detailed within the Environmental Statement – Transport Chapter.

Future Exposure

The Proposed Development is located within close proximity to B4022 Hailey Road. Subsequently, the proposals have potential to introduce new receptors into an area of elevated NO_2, PM_{10} and $PM_{2.5}$ concentrations.

Detailed dispersion modelling was therefore undertaken to quantify annual mean pollutant concentrations across the site and determine suitability for the proposed use. The following modelling scenarios were utilised during the future exposure assessment:

- **Opening year do-something (DS)** (predicted traffic flows in 2024 should the proposals be completed, with the addition of traffic generated by the Proposed Development)
- **Future year do-something (DS**) (predicted traffic flows in 2031 should the proposals be completed, with the addition of traffic generated by the Proposed Development)

The results of the dispersion modelling assessment will also be compared against the relevant AQOs detailed in Table 1 to determine significance. Full details of data used for the modelling assessment are presented in Appendix B of this report.

Significance Criteria

Receptors potentially sensitive to changes in NO_2 and PM_{10} concentrations have been identified within 200m of the affected highway network road sources. LAQM (TG16)[2] provides the following examples of where annual mean AQOs should apply:

- Residential properties;
- Schools;
- Hospitals; and,
- Care homes.

The sensitivity impact significance of each receptor was defined in accordance with the criteria shown in Table 3. These are based upon the guidance provided within the Environmental Protection UK (EPUK) and IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality'[4].

Table 3 Operational Traffic Exhaust Emissions – Assessment of Impact

Long Term Average Concentration	**% Change in Concentration Relative to AQO**			
	1	**2-5**	**6-10**	**>10**
75% or less of AQO	Negligible	Negligible	Minor	Moderate
76 - 94% of AQO	Negligible	Minor	Moderate	Moderate
95 - 102% of AQO	Minor	Moderate	Moderate	Major
103 - 109% of AQO	Moderate	Moderate	Major	Major
110% or more of AQO	Moderate	Major	Major	Major

The criteria shown in Table 3 is EPUK and IAQM guidance with sensitivity descriptors included to allow comparisons of various air quality impacts. It should be noted that changes of 0%, i.e. less than 0.5%, will be described as negligible in accordance with the EPUK and IAQM guidance[4]. Following the prediction of impacts at discrete receptor locations utilising the criteria in Table 3 the EPUK and IAQM document[4] states that this framework is to be used as a starting point to make a judgement on significance of effect but other influences might need to be accounted for.

Whilst impacts might be determined as 'minor', 'moderate' or 'major' at individual receptors, overall effect might not necessarily be deemed as significant in some circumstances. The following factors are also considered when determining the overall significance of a development in addition to using professional judgement and reasoning as far as practicable:

- Number of properties affected by significant air quality impacts and a judgement on the overall balance;
- Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective will be relevant;
- The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors;
- Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a major increase or decrease; and,
- The extent to which an objective is exceeded e.g. an annual mean NO_2 concentration of 41µg/m^3 should attract less significance than an annual mean of 51µg/m^3.

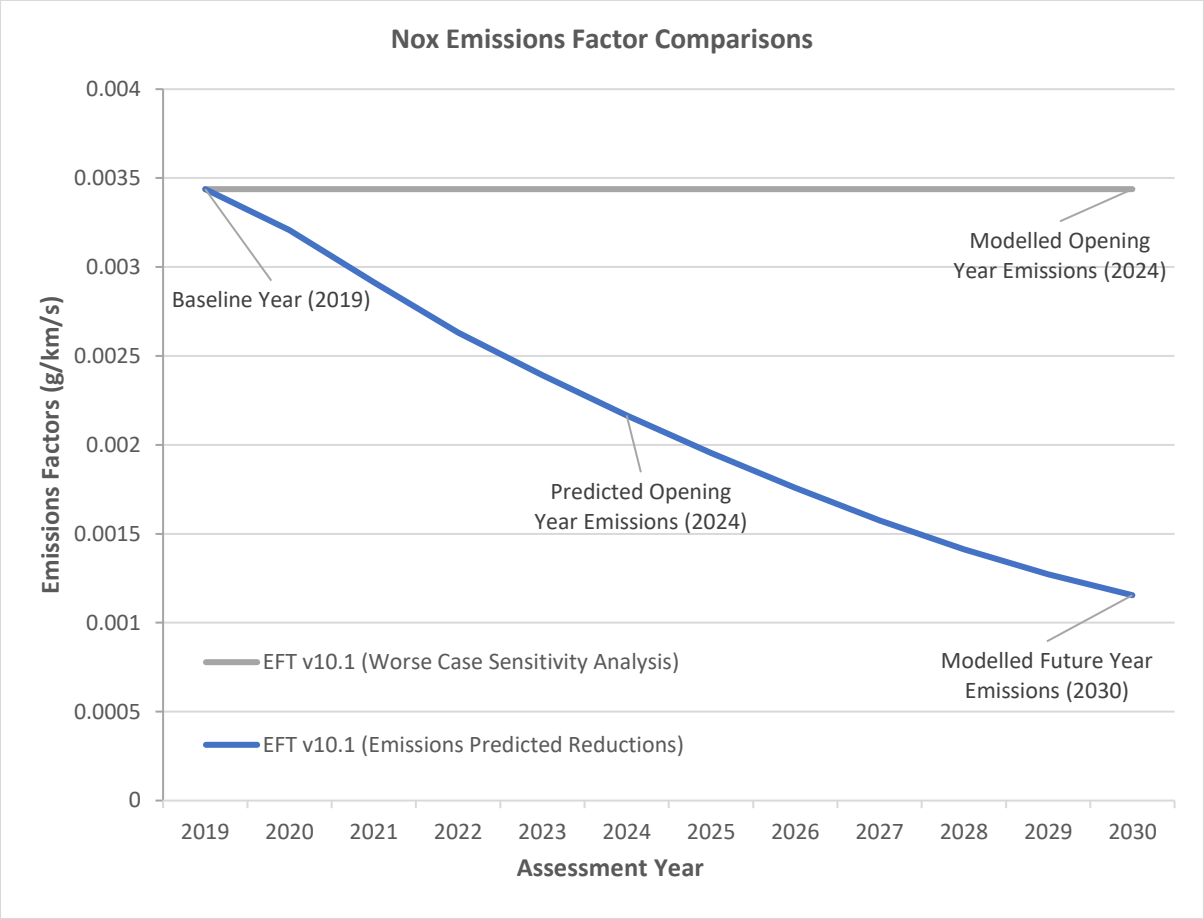
Assumption and Limitations

Operational Phase Assessment

For the operational phase assessment, there is current uncertainty over NO_2 concentrations within the UK not reducing as previously expected due to the shifts towards a greater production and uptake of electric and hybrid vehicles. In order to provide a robust assessment, emission factors for 2019 were utilised within the dispersion model for the prediction of pollution levels for all future operational scenarios. The use of 2024 traffic data, together with 2019 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted emission levels.

As detailed in Graph 1, this worse case approach does not consider any future emission reductions and accounts for a 37% increase when compared to future 2024 predictions.

Graph 1 – NO_x Emission Factor Comparisons



**** Based on 1,000 AADT, 50kph and 0% HDV%***

Similarly, it has been assumed that background concentrations will not improve in line with current predictions and therefore 2019 background concentrations have been utilised for the assessment of the opening year (2024).

The combination of worse case emission factors and background concentrations provides further overestimation to pollutant concentrations during the operation of the Proposed Development during the 2024 opening year scenario. It is therefore considered that the assessment approach is considered robust and provides an appropriate worse case analysis of associated impacts.

Given the time bewteen the 2019 baseline and 2031 future year, for the 2031 future year scenario, 2030 emissions data and background concentrations have been utilised.This is because local air quality is predicted to improve during future years, due to improved vehicle emission standards associated with a shift towards 'greener' vehicle fleet compositions such as, electric vehicles.

Uncertainty in dispersion modelling predictions can be associated with a variety of factors, including:

- **Data uncertainty** - due to errors in input data, including emission estimates, operational procedures, land use characteristics and meteorology; and
- **Variability** - random or systematic error of measurements used.

These potential uncertainties in model results were minimised as far as practicable and worst-case inputs used in order to provide a robust assessment. This included the following:

- **Choice of model** - ADMS-Roads (v5.0) are commonly used atmospheric dispersion model and results have been verified through a number of studies to ensure predictions are as accurate as possible;
- **Meteorological data** - Modelling was undertaken using four annual meteorological data sets from the most representative meteorological station observation to the site to take account of local conditions;
- Emission rates for traffic used Emission Factor Toolkit v.10.1 and for energy plant technical data sheets for proposed plant in line with current best practice approaches as discussed were appropriate within this chapter; and.
- **Variability** - All model inputs are as accurate as possible and worst-case conditions were considered as necessary in order to ensure a robust assessment of potential pollutant concentrations.

The limitations stated above are standard limitations associated with atmospheric dispersion modelling assessments. Based on the controls and assumptions detailed above it is considered that the assessment is both robust in its conclusions and completed in line with current industry standard practice.

Baseline

Existing air quality conditions in the vicinity of the application site were identified in order to provide a baseline for assessment. These are detailed in the following sections.

Local Air Quality Management

As required by the Environment Act (1995), WODC, has undertaken Review and Assessment of air quality within their area of administration. This process has indicated that concentrations of NO_2 are above the Air Quality Objectives (AQO) within this area. As such, one AQMA has been declared, described as:

"Witney AQMA (annual mean NO_2 exceedances) - An area incorporating Bridge Street, Witney and the junctions with New Yatt Road, Newland, Mill Street and High Street, encompassing a number of residential and commercial properties."

The site is located approximately 960m to the North of the Witney AQMA and as such, there is the potential for the proposed development to introduce future site users to elevated pollutant concentrations, as well as to cause potential impacts to air quality within this sensitive area. This has been considered further within this report. Reference should be made to Figure 1 within Appendix A for a graphical representation of the AQMA.

WODC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs.

Air Quality Monitoring

A review of the WODC Air Quality Annual Status Report[5] indicates that there are no automatic analysers currently operating within the area of their administration.

WODC utilise passive diffusion tubes to monitor NO_2 concentrations throughout the area of administration. A review of the most recent monitoring data available indicated that there are 7

[5] West Oxfordshire District council 2020 Air Quality Annual Status Report, June 2020

diffusion tubes located in the vicinity of the proposed development. Recent NO_2 monitoring results from these locations are shown in Table 4. Any exceedances of the AQO are shown in bold.

Table 4 Diffusion Tube Monitoring Results

Site Name		Type	NGR (m)		Annual Mean NO_2 Concentration (µg/m^3)		
			X	Y	2017	2018	2019
NAS1	20 Bridge Street	Roadside	435860	210285	49.9	48.2	44.8
NAS2	25 Bridge Street	Roadside	435821	210243	40.6	40.5	37.1
NAS3	10 Bridge Street	Roadside	435849	210280	43.9	41.8	41.9
NAS4	4A West End	Roadside	435682	210195	34.4	31.9	33.9
NAS5	9 Mill Street	Roadside	435897	210324	33.9	35.5	33.1
NAS6	Woodgreen Hill	Roadside	435940	210351	33.9	34.4	35.5
NAS7	Newland	Roadside	435946	210326	35.8	34.5	34.3

As indicated in Table 4, the annual mean AQO for NO_2 was exceeded at NAS1, NAS2 and NAS3 in recent years. This is due to their roadside location within an AQMA. Annual mean NO_2 concentrations at all other diffusion tubes were below the relevant AQO.

Reference should be made to Figure 2 within Appendix A for a graphical representation of the monitoring locations.

Background Pollutant Concentration

The total concentration of a pollutant is comprised of explicit local emission sources (such as roads and industrial sources) and the background component. The background component consists of indeterminate sources which are transported into an area from further away by meteorological conditions. Background pollutant concentrations are therefore the ambient level of pollution that is not affected by local sources of pollution.

In reality, it is not usually practical to obtain a true representation of background levels in urban areas due to corruption by local sources; background levels used in assessments may contain a mixture of both sources.

Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The Proposed Development site is located in grid square:

- NGR: 435500, 211500.

Data for this location was downloaded from the DEFRA website[6]. For the purpose of this assessment, background concentrations are summarised in Table 5 for the verification year (2019) and the predicted development opening year (2024) and Development Future year (2030).

6 http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html.

Table 5 Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m^3)		
	2019	**2024**	**2030**
NO_x	10.03	8.41	7.50
NO_2	7.78	6.59	5.92
PM_{10}	14.47	13.55	13.32
$PM_{2.5}$	9.48	8.75	8.57

As shown in Table 5, background pollutant concentrations do not exceed the relevant AQOs. Comparison with the monitoring results indicates the impact that vehicle exhaust emissions from the highway network have on pollutant concentrations at roadside locations, specifically with AQMAs.

Sensitive Receptors

A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for construction dust impacts in the following Sections.

Construction Phase Sensitive Receptors

There are no nationally or European designated ecological receptors within 50m of the Site boundary, or within 50m from a route used by construction vehicles on the public highway (up to 500m from the Site entrance). Therefore, the risk of dust effects at a nationally or European designated ecological receptor site from construction impacts have not been considered further in this assessment.

Human receptors sensitive to potential dust impacts during, demolition, earthworks and construction were identified from a desk-top study of the area up to 350m from the Proposed Development boundary. These are summarised in Table 6.

Table 6 Demolition, Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors
Less than 20	More than 100
20 - 50	More than 100
50 - 100	More than 100
100 - 350	More than 100

Reference should be made to Figure 3 within Appendix A for graphical representation of the Demolitions, Earthworks and Construction buffer zones

Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the site access route. These are summarised in Table 7. The exact construction vehicle access routes were not available for the purpose of this assessment as they will depend on sourcing of materials. This is likely to be decided by the contractor. However, it was assumed that construction traffic would access the Proposed Development via Hailey Road, to ensure a worst case trackout assessment is undertaken.

Table 7 Trackout Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors

Less than 20	10 - 100
20 – 50	More than 100

Reference should be made to Figure 4 within Appendix A for a graphical representation of trackout dust buffer zones.

A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 8.

Table 8 Additional Area Sensitivity Factor

Guidance	Comment
Whether there is any history of dust generating activities in the area	The proposal is located in a residential area. As such, there is likely to have been a history of dust generating activities due to development in the locality.
The likelihood of concurrent dust generating activity on nearby sites	A review of the WODC planning portal indicated that there are no major committed planning applications within 500m of the site. However, the site is part of a Wider SDA and Local Plan development scheme.
Pre-existing screening between the source and the receptors	There is currently vegetation present along the majority of the site boundary. As such, there is natural protective screening to receptors
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	The wind direction is predominantly from the south west of the development, as shown in Figure 5 within Appendix A. As such, properties to the north east would be most affected by dust emissions.
Conclusions drawn from local topography	The topography of the area appears to be predominantly flat. As such, there are no constraints to dust dispersion
Duration of the potential impact, as a receptor may become more sensitive over time	Currently it is unclear as to the duration of the construction phase. Given the anticipated 2024 opening year it is likely to extend over one year.
Any known specific receptor sensitivities which go beyond the classifications given in the document.	No specific receptor sensitivities identified during the assessment

Operational Phase Sensitive Receptors

Specified receptors for operational impacts are selected as areas representative of indicative worst-case locations in respect to changes in traffic emissions.

A desk-top study was undertaken in order to identify any sensitive receptor locations in the vicinity of the site that require specific consideration during the assessment. These were modelled at a height of 1.5m in order to represent ground floor level and are summarised in Table 9.

Table 9 Existing Sensitive Human Receptors

Receptor		NGR (m)		Height (m)	In AQMA?
		X	Y		
R1	86d Hailey Road, near Schofield Avenue	435739.1	211037.3	1.5	No
R2	45 Hailey Road, near Farmers Close	435659.0	210793.5	1.5	No
R3	2 Hailey Road/Crawley Road	435597.4	210628.1	1.5	No
R4	69 West End	435657.1	210565.2	1.5	No
R5	36 West End, near Miller Mews	435795.1	210488.3	1.5	No
R6	34a Corner Between West End and Bridge Street	435907.4	210345.1	1.5	Yes
R7	2 West End	435923.9	210359.1	1.5	Yes
R8	1 Woodgreen Hill/Newland	435953.5	210352.7	1.5	Yes
R9	Mill House Care Home	435921.9	210335.5	1.5	Yes
R10	Newland House Care Home	436165.4	210220.2	1.5	Yes
R11	31 Bridge Street	435883.4	210329.0	1.5	Yes
R12	Bridge House	435786.3	210201.3	1.5	Yes
R13	16 Bridge Street	435825.1	210254.2	1.5	Yes
R14	24 Bridge Street	435847.3	210281.9	1.5	Yes
R15	13 Bridge Street	435814.9	210261.1	1.5	Yes
R16	1 to 8 Riverside Cott	435735.0	210193.7	1.5	No
R17	107 High Street	435743.5	210158.3	1.5	No
R18	92 High Street, near Witan Way	435751.4	210072.8	1.5	No
R19	73 Woodgreen Hill	435983.7	210419.8	1.5	No
R20	12 Mill Street	435625.1	210208.3	1.5	No

The sensitive receptors identified in Table 9 represent worst-case locations. However, this is not an exhaustive list and there may be other locations within the vicinity of the site that may experience air quality impacts as a result of the Proposed Development that have not been individually identified above. Reference should be made to Figure 6 within Appendix A for a graphical representation of operational phase emission sensitive human receptor locations.

Assessment Impacts

Construction Phase -Dust Risk

Step 1 – Screening

The undertaking of activities such as demolition, excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions

throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the resuspension of dust from haul road and highway surfaces.

The desk-study detailed in Table 6 and Table 7 identified a number of receptors with a **high** of sensitivity within 350m of the site boundary, and within 50m of the anticipated trackout routes. As such, a detailed assessment of potential dust impacts was required, and summarised in the below sections.

Reference should be made to Appendix D for details of the relevant IAQM construction phase assessment criteria, which were utilised in conjunction with site specific information.

Step 2A – Magnitude

The scale and nature of the works was determined to assess the magnitude of dust arising from each construction phase activity. The determination of magnitude was based upon the criteria detailed in Appendix D, with the outcome of Step 2A is summarised below in Table 10**.**

Demolition

There is no requirement for demolition in order to prepare the site for construction. Subsequently, this aspect of the construction phase dust risk assessment has not been considered further.

Earthworks

The Proposed Development site is estimated to cover an area of greater than 10,000m^2. The magnitude of potential dust emissions related to earthwork activities is therefore considered **large.**

Construction

The proposals comprise the construction of 120 residential units, given the scale of the Proposed Development the total building and infrastructure volume is between 25,000m^3 and 100,000m^3. The magnitude of potential dust emissions related to construction activities is therefore considered **medium.**

Trackout

Information on the number of HDV trips to be generated during the construction phase of the Proposed Development was not available at the time of assessment. Similarly, the surface material was not known at this stage of the project. Based on the site area, it is anticipated that the unpaved road length is likely to be greater than 100m. The magnitude of potential dust emissions from trackout is therefore considered **large.**

The next step (Step 2B) is to determine the sensitivity of the surrounding area, based on general principles such as amenity and aesthetics, as well as human exposure sensitivity.

Table 10 Dust Emission Magnitude

Magnitude of Activities		
Earthworks	**Construction**	**Trackout**
Large	Medium	Large

Step 2B – Magnitude

The next step (Step 2B) is to determine the sensitivity of the surrounding area, based on general principles such as amenity and aesthetics, as well as human exposure sensitivity.

Dust Soiling

As shown in Table 6 the desk top study indicated there are **more than 100** sensitive receptors within 50m of the Proposed Development boundary and within 20m of the anticipated trackout routes.

Based on the assessment criteria detailed in Appendix D, the sensitivity of the receiving environment to potential dust soiling impacts was considered to be high for all construction phase activities. This is because the site is situated in a predominantly residential area and the people or property would reasonably be expected to be present here for extended periods of time.

Human Health

The annual mean concentration of PM_{10} is 14.47µg/m^3 as detailed in Table 5, based on the receptor counts provided above, the area is considered to be of medium sensitivity for earthworks and construction phase activities and medium sensitivity for demolition, earthworks and construction phase activities, and low for trackout actitvies.

The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria detailed in Appendix D is summarised in .

Table 11.

Table 11 Sensitivity of the Surrounding Area

Potential Impact	**Sensitivity of the Surrounding Area**		
	Earthworks	**Construction**	**Trackout**
Dust Soiling	High	High	High
Human Health	Medium	Medium	Low

Step 2C – Risk

Both the magnitude and sensitivity factors are combined in Step 2C to determine the risk of dust impacts without the application of best practice mitigation measures.

It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction phase. A summary of the risk from each dust generating activity is provided in Table 12.

Table 12 Summary of Potential unmitigated Dust Risks

Potential Impact	Risk of the Surrounding Area		
	Earthworks	**Construction**	**Trackout**
Dust Soiling	High	Medium	High
Human Health	Medium	Medium	Low

Step 2C – Risk

The IAQM guidance provides a number of potential mitigation measures to reduce impacts during the construction phase. These measures have been adapted for the Site as summarised in Table 13. It will be required to review these measures prior to the commencement of construction works and incorporated into existing strategies where practical.

Table 13 Fugitive Dust Mitigation Measures

Issue	Control Measure
Communications	• Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. • Display the head or regional office contact information • Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority.
Site Management	• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked • Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book. • Hold regular liaison meetings with other high-risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.
Monitoring	• 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

Issue	Control Measure
	window sills within 100 m of site boundary, with cleaning to be provided if necessary. • Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. • Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Preparing & Maintaining Site	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. • Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive time period • Avoid site runoff of water or mud • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Cover, seed or fence stockpiles to prevent wind whipping.
Operating Vehicle/Machinery & Sustainable Travel	• Ensure all vehicles switch off engines when stationary - no idling vehicles. • Avoid the use of diesel- or petrol-powered powered generators and use mains electricity or battery powered equipment where practicable. • Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un- surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate) • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials

Issue	Control Measure
	• Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	• Avoid bonfires and burning of waste materials
Earthworks & Construction	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable • Only remove the cover in small areas during work and not all at once • Avoid scabbling (roughening of concrete surfaces) if possible • 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. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. • For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.

Issue	Control Measure
	• Record all inspections of haul routes and any subsequent action in a site log book. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. • Access gates to be located at least 10 m from receptors where possible.

Step 4 – Residual Impacts

Assuming that all relevant mitigation measures outlined in Table 13 are implemented effectively, the impact from all dust generation activities is predicted to be negligible and not significant.

Construction Phase Road Vehicle Exhaust Emission Impacts

Any additional vehicle movements associated with the construction phase of the Proposed Development will generate exhaust emissions, such as NO_2, PM_{10} and $PM_{2.5}$ on the local and regional road networks.

Traffic data provided by i-Tranport, the appointed traffic consultant for the scheme, indicated the construction phase of the Proposed Development is anticipated to generate a maximum AADT flow of 62 on the local road network (39LDV and 23HDV). As such, it is considered that the construction phase of the site will not result in a change of AADT flows of more than 500, produce over 100 HDV movements per day or significantly affect average speeds on the local road network.

Subsequently, potential air quality impacts associated with construction phase road vehicle exhaust emissions are predicted to be not significant in accordance the EPUK and IAQM screening criteria.

Operational Phase Assessment

Future Exposure

Annual mean NO_2 and PM concentrations were predicted across the Proposed Development for the 2024 and 2031 DS scenario at a height of 1.5m to represent exposure across the ground floor level, as shown in Figures 7 to Figure 12 within Appendix A.

Background NO_2 and PM_{10} levels are likely to be lower at elevated heights due to increased distance from emission sources, such as roads. Therefore, predicted concentrations at heights above ground floor level are considered acceptable in regards to future exposure and have not been assessed further.

2024 Scenario (2019 Emissions)

Nitrogen Dioxide (NO_2)

Predicted annual mean NO_2 concentrations across the Proposed Development site during the DS scenario are summarised in Table 14.

Table 14 Modelling Results - Annual Mean NO_2 at Proposed Sensitive Use

Floor Level	Predicted 2024 Annual Mean NO_2 Concentration ($\mu g/m^3$)
Ground (1.5m)	8.00 – 11.95

The predicted concentrations shown in Table 14 indicate that there were no exceedances of the AQO at sensitive locations across ground floor areas of the proposed development. As such, it is considered that annual mean NO_2 levels at the Proposed Development site should not be viewed as a constraint to development.

Predictions of 1-hour NO_2 concentrations were not produced as part of the dispersion modelling assessment. LAQM(TG16)[2] states if annual mean NO_2 concentrations are below 60µg/m^3 then it is unlikely that the 1-hour AQO will be exceeded. As such, based on the results in Table 14, it is not predicted that on-site concentrations will exceed the 1-hour mean AQO for NO_2.

Based on the results of the dispersion modelling assessment, the site is considered to be suitable for residential use without the implementation of mitigation techniques to protect future site users from elevated NO_2 concentrations.

Particulate Matter (PM_{10} & $PM_{2.5}$)

Predicted annual mean PM concentrations across the Proposed Development site during the DS scenario are summarised in Table 15.

Table 15 Modelling Results - Annual Mean PM at Proposed Sensitive Use

Floor Level	Predicted 2024 Annual Mean Concentration ($\mu g/m^3$)	
	PM_{10}	$PM_{2.5}$
Ground (1.5m)	14.50 – 15.27	9.50 – 9.97

The predicted concentrations shown in Table 15 indicate that there were no exceedances of the annual mean AQOs for PM_{10} or $PM_{2.5}$ throughout the modelling area. As such, it is considered that annual mean PM levels at the Proposed Development site should not be viewed as a constraint to development.

Based on the results of the dispersion modelling assessment, the site is considered to be suitable for proposed end use without the implementation of mitigation techniques to protect future site users from elevated PM concentrations.

2031 Scenario

Nitrogen Dioxide (NO_2)

Predicted annual mean NO_2 concentrations across the Proposed Development site during the DS scenario are summarised in Table 16.

Table 16 Modelling Results - Annual Mean NO_2 at Proposed Sensitive Use

Floor Level	Predicted 2031 Annual Mean NO_2 Concentration (µg/m^3)
Ground (1.5m)	6.03 – 8.57

The predicted concentrations shown in Table 16**Error! Reference source not found.** indicate that there were no exceedances of the AQO at sensitive locations across ground floor areas of the proposed development. As such, it is considered that annual mean NO_2 levels at the Proposed Development site should not be viewed as a constraint to development.

Predictions of 1-hour NO_2 concentrations were not produced as part of the dispersion modelling assessment. LAQM.(TG16)[2] states if annual mean NO_2 concentrations are below 60µg/m^3 then it is unlikely that the 1-hour AQO will be exceeded. As such, based on the results in Table 16, it is not predicted that on-site concentrations will exceed the 1-hour mean AQO for NO_2.

Based on the results of the dispersion modelling assessment, the site is considered to be suitable for residential use without the implementation of mitigation techniques to protect future site users from elevated NO_2 concentrations.

Particulate Matter (PM_{10} & $PM_{2.5}$)

Predicted annual mean PM concentrations across the Proposed Development site during the DS scenario are summarised in Table 17.

Table 17 Modelling Results - Annual Mean PM at Proposed Sensitive Use

Floor Level	Predicted 2031 Annual Mean Concentration (µg/m^3)	
	PM_{10}	$PM_{2.5}$
Ground (1.5m)	13.36 – 14.45	8.60 – 9.42

The predicted concentrations shown in Table 17 indicate that there were no exceedances of the annual mean AQOs for PM_{10} or $PM_{2.5}$ throughout the modelling area. As such, it is considered that annual mean PM levels at the Proposed Development site should not be viewed as a constraint to development.

Based on the results of the dispersion modelling assessment, the site is considered to be suitable for proposed end use without the implementation of mitigation techniques to protect future site users from elevated PM concentrations.

Impact Assessment - Predicted Concentrations at Existing Sensitive Use

2024 Opening Year Scenario (2019 Emissions)

Predicted impacts on annual mean NO_2 concentrations as a result of operational phase exhaust emissions were predicted to be **negligible** at 10 sensitive receptor locations within the vicinity of the site.

At the remaining sensitive receptors there are anticipated to be **substantial beneficial** impacts at 3 locations (R6,R11 and R14) and **moderate benefical** impacts at 6 sensitive receptors within Witney AQMA (R7 to R9, R12, R13 and R15).

These receptor location represent those that are isolated to the Witney AQMA and experience elevated pollutant concentrations during both the DM and DS scenario. However critically these exceed in both the DM and DS scenarios and are antcipated to experince a decrease in pollutnat concentrations as a result of the proposed development.

Additonally PM_{10} and $PM_{2.5}$ concentrations as a result of operational phase exhaust emissions were predicted to be **negligible** at 20 sensitive receptor locations within the vicinity of the site.

Overall, thirteen receptors experience a decrease in pollutant concentrations as a result of the proposed development. These decreases are as a result of a redistribution of traffic along the existing road network modelled within the dynamic Witney Highways Model as confirmed by i-Transport.

Increases in pollutant concentrations are anticipated at receptors located along Hailey Road, High Street and Mill Street as a result of the proposed development.

Having reached that conclusion, it should be noted that associated impacts were also based on worst case sensitivity analysis in the form of robust emission factor assumptions. The use of 2024 operational traffic data, together with 2019 emission factors does not consider future improvements (due to the current shift towards a greater production and uptake low emission vehicles) and significantly overestimate actual pollutant concentrations within the modelling domain.

Therefore, the overall significance of potential impacts was determined to be not significant in accordance with the EPUK and IAQM guidance. The use of robust assumptions, in the form of worse-case road vehicle emission factors, was considered to provide sufficient results confidence for an assessment of this nature.

Full assessment results and commentary can be found in Appendix C, further discussion on the overall impact significance is provided in Table 18.

2031 Future Year Scenario

The future year scenario accounts for the full delivery of the allocated sites within the adopted Local Plan, including both North Witney and East Witney SDAs and associated infrastructure (i.e. (Shores Green Slips Roads, West End Link Road Phase 2, and Northern Distributor Road, with the addition of the proposed development.

Predicted impacts on annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations as a result of operational phase exhaust emissions were predicted to be **negligible** at 20 sensitive receptor locations within the vicinity of the site.

As above, thirteen of the receptor locations modelled, are anticipated to experience a decrease in pollutant concentrations as a result of the proposed development. This is due of a reduction of traffic along West End and Bridge Street, as a result of the delivery of the West End Link, Northern Distributor Road and Shores Green.

Increases in pollutant levels are anticipated along B4022 Hailey Road (R1 to R13) as a result of redistributed traffic along this route to the delivered peripheral routes via the West End Link.

The overall significance of potential impacts was determined to be not significant in accordance with the EPUK and IAQM guidance. The use of robust assumptions, in the form of worse-case road vehicle emission factors, was considered to provide sufficient results confidence for an assessment of this nature.

Full assessment results and commentary can be found in Appendix C, further discussion on the overall impact significance is provided in Table 18.

Bridge Street/Witney AQMA

Whilst the overall AADT along Bridge Street and the A4095 is anticipated to increase by 761 and 685 respectively, the HGV proportion travelling along this route is expected to decrease by 304 and 288 AADT.

As such, receptor locations within the Witney AQMA are predicted to experience an overall decrease in pollutant concentrations as a result of the proposed development.

Overall Impact Significance

The overall significance of operational phase road traffic emission impacts for 2024 and 2031 was determined as not significant. This was based on the predicted impacts at discrete receptor locations and the considerations outlined in Section 5.2. Further justifications are provided in Table 18.

Table 18 Overall Road Emissions Impact Significance

Guidance	**Comment**	
	2024	**2031**
Number of properties affected by slight, moderate or substantial air quality impacts and a judgement on the overall balance	Impacts on annual mean NO_2 concentrations were predicted to be **negligible** at 11 receptor locations, **moderate beneficial** at 6 locations, and **substantial beneficial** at 3 receptor locations. The receptor locations at which **moderate beneficial** and **substantial beneficial** are located within Witney AQMA, where traffic redcutions are anticpated as a result fo a redistribution of traffic along the affected road networks. it should be noted that associated impacts were also based on worst case sensitivity analysis in the form of robust emission factor assumptions. The use of 2024 operational traffic data, together with 2019 emission factors does not consider future improvements (due to the current shift towards a greater production and uptake low emission vehicles) and significantly overestimate actual pollutant concentrations within the modelling domain. Impacts on PM_{10} and $PM_{2.5}$ concentrations were predicted to be **negligible** on a permanent basis at all sensitive receptors.	Impacts on NO_2, PM_{10} and $PM_{2.5}$ concentrations were predicted to be **negligible** at all sensitive receptors considered. These represent worst-case locations and therefore it is unlikely that any other receptors would be significantly affected by the proposed development as changed.

Guidance	Comment	
	2024	**2031**
Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective or limit value will be relevant	There were predicted exceedances of the annual mean AQO for NO_2 at sensitive receptor locations within the Witney AQMA.	There were no predicted exceedances of the relevant annual mean AQOs at sensitive locations across the proposed development as changed, and as such no new exposure has been introduced to levels above the AQOs
The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors	The change in concentration relative to the AQO was predicted to range from: • -3.85% to 0.93% for NO_2; • -0.50 % to 0.20% for $PM_{10;}$ and • -0.48% to 0.20% for $PM_{2.5}$ As such, resultant impacts on annual mean $NO_{2,}$ concentrations were predicted to be **negligible** at 11 sensitive receptor locations, **moderate** at 6 locations and **subtantial** at 3 receptor locations. Resultant impacts on annual mean PM_{10} and $PM_{2.5}$ concentrations were predicted to be **negligible** at all sensitive receptor locations,	The change in concentration relative to the AQO was predicted to range from: • -1.35% to 0.43% for NO_2; • -0.50 % to 0.20% for $PM_{10;}$ and • -0.44% to 0.20% for $PM_{2.5}$ As such, resultant impacts on annual mean $NO_{2,}$ PM_{10} and $PM_{2.5}$ concentrations were predicted to be **negligible** at all sensitive receptor locations.
Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease	There were exceedances of the AQOs for NO_2 at 6 sensitive receptor locations within the modelling extents for the 2024 DM and DS scenarios. Critically, all AQO exceedances were predicted during both the DM and DS and therefore no new exposure above the AQO are accounted to the operation of the Proposed Development. Conversely, there were no predicted exceedances of the annual mean AQO for PM_{10} or $PM_{2.5}$ at any location within the modelling extents.	There were no exceedances of the annual mean AQO for NO_2, PM_{10} and $PM_{2.5}$ at sensitive locations throughout the modelling extents.
The extent to which an objective is exceeded e.g. an annual mean NO_2 concentration of 41µg/m^3 should attract less	As stated above there were exceedances of the annual mean AQO for NO_2 at 6 sensitive locations, of which one location exceeded an annual mean	There were no exceedances of the annual mean AQO for NO_2 at any sensitive locations within the modelling extents.

Guidance	Comment	
	2024	**2031**
significance than an annual mean of 51µg/m^3	concentration of 51µg/m3. The maximum exceedance was predicted at 55.25µg/m3 (R14) however this is expected to decrease as a result of the development.	

For the 2024 scenario, the combined use of 2024 traffic data and 2019 emission factors is considered to provide a worst-case scenario, which may lead to overestimations of actual pollutant concentrations during the operation of the proposals. As such, the overall significance of operational phase road traffic emission impacts on annual mean NO_2 and PM concentrations was determined **not significant.**

The assessment was undertaken in accordance with the methodology detailed above and full impact assessment results can be found in Appendix C.

Additional Mitigation

Construction Phase

Assuming the relevant mitigation measures outlined in Table 13 are implemented, the residual effect from all dust generating activities is predicted to be not significant, in accordance with the IAQM guidance.

Operational Phase

There is a requirement to secure a reduction in pollution concentrations associated with road vehicle exhaust emissions. The offsetting measures are therefore proposed and will be implemented within the design of the Proposed Development:

- Residential – 1 Fast Charge Electric Vehicle (EV) charging point per dwelling with dedicated parking.; and
- Fast Charge Electric Vehicle (EV) charging points for 20% of the community spaces for apartments; and
- Travel plan (where required) including mechanisms for discouraging high emission vehicle use and encouraging the uptake of low emission fuels and technologies.

It is considered that the above measures are proportional to the nature and scale of the Proposed Development, and will secure a reduction in development associated road vehicle exhaust emissions, along the road network, *including further reductions within Bridge Street AQMA*.

Cumulative Effects

Cumulative effects are the combined effects of several development schemes (in conjunction with the Proposed Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.

The ES has given consideration to 'Cumulative 'Effects' for full delivery of the following

- Allocated sites within the adopted Local Plan, including both North Witney and East Witney SDA and associated infrastructure (i.e. (Shores Green Slips Roads, West End Link Road Phase 2, and Northern Distributor Road.

The transport assessment has considered all additional road traffic in future years attributable from committed (cumulative) schemes from the wider area. The presented DM and DS scenarios therefore incorporate the traffic generated by committed developments in the area cumulatively with the traffic generated by the Proposed Development.

Residual Effects

Construction Phase

Assuming the relevant mitigation measures outlined in Table 13 are implemented, the residual effect from all dust generating activities is predicted to be not significant, in accordance with the IAQM guidance.

Operational Phase

Impacts on NO_2, PM_{10} and $PM_{2.5}$ concentrations as a result of operational phase emissions for the 2024 Scenario were predicted to neglgible at receptors where traffic was predicted to increase as a result of the proposed development. Where traffic reductions are predicted there are substantial and moderate beneficial impact at sensitive receptor locations, largely isolated to those within the AQMA.

For the 2031 Scenraio, impacts on NO_2, PM_{10} and $PM_{2.5}$ concentrations as a result of operational phase emissions were predicted to be negligible at 20 sensitive locations and within the nearby AQMA's.

The overall significance of impacts was therefore considered to be not significant, in accordance with the EPUK and IAQM guidance without the consideration of mitigation measures for both development scenarios. Consequently, the residual effects from road vehicle exhaust emissions associated with traffic generated by the proposal are predicted to be negligible.

In addition, there were no predicted exceedances of the AQOs at proposed sensitive locations across the development site and therefore the exposure of future site users is also considered not significant for both 2024 Scenario and 2031 Scenario.

Conclusions

The proposed development has the potential to cause air quality impacts at sensitive locations. As such, an Air Quality ES Chapter was required to quantify pollutant levels across the site, consider its suitability for the proposed end-use and assess potential impacts as a result of the development for two development scenarios.

During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust mitigation measures are implemented through a CEMP, the residual significance of potential air quality impacts from dust generated by earthworks, construction and trackout activities was predicted to be negligible and therefore not significant for both 2024 Scenario and 2031 Scenario.

Dispersion modelling was undertaken in order to quantify pollutant concentrations at the site and to predict air quality impacts as a result of road vehicle exhaust emissions associated with traffic generated by the development. Results were subsequently verified using monitoring results obtained from WODC.

The dispersion modelling results indicated that pollutant levels at sensitive locations across the site were below all relevant AQOs for both development scenarios. The location is therefore considered

suitable for the proposed end-use without the inclusion of mitigation methods to protect future users from poor air quality.

Predicted impacts on existing sensitive receptors as a result of operational exhaust emissions were predicted to have negligible impacts in at receptors where traffic was predicted to increase as a result of the rpoposed development. Where traffic reductions are predicted there is a beneficial impact at sensitive receptor locations, largely isolated to those within the AQMA.

For the 2031 Scenario, predicted impacts on existing sensitive receptors as a result of operational exhaust emissions were predicted to have negligible impacts as a result of the proposed development.

The overall significance of potential impacts was determined to be **not significant** for both development scenarios, in accordance with the EPUK and IAQM guidance.