Air Quality Impact Assessment

C10785

Campdown, Purbrook,
Portsmouth, PO7 8AA

Prepared for

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Omnia ref: C10785/AQA/1.2

June 2023

ISO Accredited Certification (UKAS)

DOCUMENT VERSION	DOCUMENT DATE	OWNER
1	March 2023	Head of Environmental Planning Services

Quality Assurance

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	Draft	Minor Changes	Re-Modelling of $PM_{2.5}$	
Date	March 2023	June 2023	June 2023	
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Executive Summary	
Site Address	Campdown, Purbrook, PO7 8AA

Omnia was commissioned by Dandara Homes Ltd to undertake an Air Quality Impact Assessment in support a planning application for a residential development at Land Off College Road, Campdown, Purbrook, PO7 8AA.

The proposals comprise mixed-use residential development comprising 628 dwellings, community centre, allotments, public open space including play areas, a new junction to College Road and associated infrastructure.

The proposals have the potential to cause air quality impacts at sensitive locations. These may include fugitive dust emissions during construction and road traffic exhaust emissions from vehicles travelling to and from the site during operation. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions and assess potential effects associated with the scheme.

Potential construction phase air quality impacts from fugitive dust emissions were assessed as a result of earthworks, construction and trackout activities. It is considered that the use of good practice control measures would provide suitable mitigation for a development of this size and nature and reduce potential impacts to an acceptable level.

Potential impacts during the operational phase of the proposals may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the site. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the local highway network both with and without the development in place. Results were subsequently verified using local monitoring data.

Review of the dispersion modelling results indicated that air quality impacts as a result of road vehicle exhaust emissions were not predicted to be significant at any sensitive location in the vicinity of the site.

The dispersion modelling assessment results also demonstrated that predicted pollution levels were below the relevant air quality standards across the development. As such, the site is considered suitable for the proposed end use from an air quality perspective.

Based on the assessment results with best practice measure advised, air quality factors are not considered a constraint to planning consent for the development.

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1.0 INTRODUCTION

1.1 Background

Omnia was commissioned by Dandara Homes Ltd to undertake an Air Quality Impact Assessment in support a planning application for a residential development at Campdown, Purbrook, PO7 8AA.

1.2 Proposed Development

The site is located on land at Land Off College Road, Campdown, Purbrook, PO7 8AA, at approximate National Grid Reference (NGR): 469210, 10010. Reference should be made to Figure 1 for a map of the site and surrounding area within Appendix- I.

The proposals comprise of mixed-use residential development comprising 628 dwellings, community centre, allotments, public open space including play areas, a new junction to College Road and associated infrastructure.

1.3 Objectives

The proposals have the potential to cause air quality impacts at sensitive locations during the construction and operational phases, as well as expose future residents to elevated pollution levels due to the proximity of the site to the A3 (M) and associated emissions. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider site suitability for the proposed end-use and assess potential impacts associated with the scheme. This is provided in the following report.

1.4 Acronyms

All acronyms used within this report are defined in the Abbreviations listings, set out in Section 7.

1.5 Confidentiality

This report has been prepared solely for the use of the Client. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Omnia; a charge may be levied against such approval.

2.0 LEGISLATION AND POLICY

2.1 Legislation

The Air Quality Standards Regulations (2016) came into force on 31st December 2016 and include Air Quality Limit Values (AQLVs) for the following pollutants:

- Nitrogen dioxide (NO_2);
- Sulphur dioxide;
- Lead;
- Particulate matter with an aerodynamic diameter of less than 10µm (PM_{10});
- Particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$);
- Benzene; and,
- Carbon monoxide.

Air quality target values have also been provided for several additional pollutants. It should be noted that the AQLV for $PM_{2.5}$ stated in the Air Quality Standards Regulations (2010) was amended in the Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020).

Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007[1]. The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

Table 1 presents the AQOs and AQLVs for pollutants considered within this assessment.

Table 1 Air Quality Objectives/ Limit Values

Pollutant	Air Quality Objective/ Limit Values	
	Concentration	Averaging Period
NO_2	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM_{10}	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
$PM_{2.5}$	20	Annual mean

Table 2 summarises the advice provided in DEFRA guidance[2] on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

Averaging Period	Objective Should Apply At	Objective 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

[1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.
[2] Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
		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 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.2 Local Air Quality Management

Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 2, are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

In addition to the above, the Environment Act (2021) introduces a commitment to create a legally binding duty on the government to reduce the concentrations of fine particulate matter ($PM_{2.5}$) in ambient air, and to set a long-term target expected to be 10 µg/m^3, a reduction from the current Air Quality objective of 20 µg/m^3 set out within the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020. A draft of a statutory instrument (or drafts of statutory instruments) containing regulations setting the $PM_{2.5}$ air quality target must be laid before Parliament on or before 31st October 2022 and came into force in February 2023.

2.3 Dust

The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments, such as construction sites, is that provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

> "any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."

Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.4 National Planning Policy

The revised National Planning Policy Framework[3] (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.
The purpose of the planning system is to contribute to the achievement of sustainable development. In order to ensure this, the NPPF recognises three overarching objectives, including the following of relevance to air quality:

> "c) 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."

Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

> "Planning policies and decisions should contribute to and enhance the natural and local environment by:
>
> [...]
>
> e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality [...]"

The NPPF specifically recognises air quality as part of delivering sustainable development and states that:

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

The implications of the NPPF have been considered throughout this assessment.

2.5 National Planning Practice Guidance

The National Planning Practice Guidance[4] (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 and updated on 1st November 2019 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. What air quality considerations does planning need to address?
2. What is the role of plan-making with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?
5. When could air quality considerations be relevant to the development management process?

[3] NPPF, Ministry of Housing, Communities and Local Government, 2021.
[4] https://www.gov.uk/guidance/air-quality--3.

6. What specific issues may need to be considered when assessing air quality impacts?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?

These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

2.6 Local Planning Policy

The adopted Local Plan for Havant Borough Council (HBC) is made up of the Core Strategy (2011) [5] and the Site Allocations Plan (2014)[6] which were adopted on 1st March 2011 and 23rd July 2014, respectively. The documents set out sites allocated for development in the district, as well as a range of strategic policies that form the basis of planning application decisions.

A review of the Core Strategy[7] was undertaken in order to identify any planning policies relevant to the assessment. This indicated the following:

> DM10 Pollution:
>
> "Development that may cause pollution of water, air or soil or pollution through noise, smell, smoke, fumes, gases, steam, dust, vibration, light, heat, electromagnetic radiation and other pollutants will only be permitted where all of the following relevant criteria can be met:
>
> [...]
>
> 2. National air quality standards or objectives would not be breached."

The above policy has been taken into consideration throughout the undertaking of the assessment.

A review of the Site Allocation Plan[8] did not identify anything of relevance to this assessment.

[5] Havant Borough Core Strategy March 2011, HBC, 2011.
[6] Havant Borough Local Plan (Allocations) July 2014, HBC, 2014.
[7] Havant Borough Core Strategy March 2011, HBC, 2011.
[8] Havant Borough Local Plan (Allocations) July 2014, HBC, 2014.

2.0 METHODOLOGY

3.1 Introduction

The proposed development has the potential to cause air quality impacts during the construction and operational phases as well as expose future residents to elevated pollution levels due to the proximity of the site to the A3 (M) and associated emissions. These issues have been assessed in accordance with the following methodology, which was agreed with the Environmental Control Officer at HBC via email.

3.2 Construction Phase

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 V1.1'[9].

Activities on the proposed construction site have been divided into three types to reflect their different potential impacts. These are:

- 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}.

The assessment steps are detailed below.

3.2.1 Step 1

Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment proceeds to Step 2. Additionally, should ecological receptors be identified within 50m of the site or the construction vehicle route up to 500m from the site entrance, then the assessment also proceeds to Step 2.

Should sensitive receptors not be present within the relevant distances then negligible impacts would be expected and further assessment is not necessary.

3.2.2 Step 2

Step 2 assesses the risk of potential dust impacts. A site is allocated 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 (Step 2A); and,
- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.

[9] Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table 3.

Table 3 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Earthworks	Total site area greater than 10,000m^2 Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) More than 10 heavy earth moving vehicles active at any one time Formation of bunds greater than 8m in height More than 100,000 tonnes of material moved
	Construction	Total building volume greater than 100,000m^3 On site concrete batching Sandblasting
	Trackout	More than 50 Heavy Duty Vehicle (HDV) trips per day Potentially dusty surface material (e.g. high clay content) Unpaved road length greater than 100m
Medium	Earthworks	Total site area 2,500m^2 to 10,000m^2 Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one time Formation of bunds 4m to 8m in height Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	Total building volume 25,000m^3 to 100,000m^3 Potentially dusty construction material (e.g. concrete) On site concrete batching
	Trackout	10 to 50 HDV trips per day Moderately dusty surface material (e.g. high clay content) Unpaved road length 50m to 100m
Small	Earthworks	Total site area less than 2,500m^2 Soil type with large grain size (e.g. sand) Less than 5 heavy earth moving vehicles active at any one time Formation of bunds less than 4m in height Total material moved less than 20,000 tonnes Earthworks during wetter months
	Construction	Total building volume less than 25,000m^3 Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	Less than 10 HDV trips per day Surface material with low potential for dust release Unpaved road length less than 50m

Step 2B defines the sensitivity of the area around the development to potential dust impacts. The influencing factors are shown in Table 4.

Table 4 Construction Dust - Examples of Factors Defining Sensitivity of an Area

Receptor Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	Users expect high levels of amenity High aesthetic or value property People expected to be present continuously for extended periods of time Locations where members of the public are exposed over a time period relevant to the AQO for PM_{10}. e.g. residential properties, hospitals, schools and residential care homes	Internationally or nationally designated site e.g. Special Area of Conservation
Medium	Users would expect to enjoy a reasonable level of amenity Aesthetics or value of their property could be diminished by soiling People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	Nationally designated site e.g. Sites of Special Scientific Interest
Low	Enjoyment of amenity would not reasonably be expected Property would not be expected to be diminished in appearance Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads	Locally designated site e.g. Local Nature Reserve

The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and,
- Any known specific receptor sensitivities which go beyond the classifications given in the document.

These factors were considered in the undertaking of this assessment.

The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in Table 5.

Table 5 Construction Dust - Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

Table 6 outlines the criteria for determining the sensitivity of the area to human health impacts.

Table 6 Construction Dust - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m^3	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m^3	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m^3	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m^3	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	Greater than 32µg/m^3	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m^3	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m^3	More than 10	Low	Low	Low	Low	Low
		1 -10	Low	Low	Low	Low	Low
	Less than 24µg/m^3	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Low	-	1 or more	Low	Low	Low	Low	Low

Table 7 outlines the criteria for determining the sensitivity of the area to ecological impacts.

Table 7 Construction Dust - Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	Less than 20	Less than 50
High	High	Medium
Medium	Medium	Low

Receptor Sensitivity	Distance from the Source (m)	
	Less than 20	Less than 50
Low	Low	Low

Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

Table 8 outlines the risk category from earthworks and construction activities.

Table 8 Construction Dust - Dust Risk Category from Earthworks and Construction Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Table 9 outlines the risk category from trackout activities.

Table 9 Construction Dust - Dust Risk Category from Trackout Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible

3.2.3 Step 3

Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance[10] to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with negligible risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

3.2.4 Step 4

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.

3.3 Operational Phase

The development has the potential to cause impacts as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site during operation, as well as expose future residents to poor air quality. Potential effects have therefore been defined by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios:

- 2019 - Verification;
- Opening year Do-Minimum (DM) (predicted traffic flows in 2033 should the proposals not proceed); and,
- Opening year Do-Something (DS) (predicted traffic flows in 2033 should the proposals be completed).

[10] Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

There are a number of existing and proposed developments around the site. As such, cumulative impacts of emissions associated with these developments were considered throughout the assessment:

Reference should be made to Appendix II for assessment input data and details of the verification process.

3.3.1 Potential Future Impacts

Locations sensitive to potential changes in off-site pollutant concentrations were identified within 200m of the highway network in accordance with the guidance provided within the Design Manual for Roads and Bridges (DMRB)[11] on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance[12] on where the AQOs apply, as summarised in Table 2, was utilised to determine worst-case receptor positions in the vicinity of links likely to be affected by changes in traffic flows as a result of the development.

The significance of predicted air quality impacts was determined in accordance with the guidance provided within the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'[13]. Using this methodology impacts were defined based on the interaction between the predicted pollutant concentration from the DS scenarios and the magnitude of change between the DM and DS scenarios, as outlined in Table 10.

Table 10 Significance of Road Vehicle Exhaust Emission Impacts

Concentration at Receptor in Assessment Year	Predicted Concentration Change as Proportion of AQO (%)			
	1	2 - 5	6 - 10	> 10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

The matrix shown in Table 10 is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as negligible.

Following the prediction of impacts at discrete receptor locations, the IAQM document[14] provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and,
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

The IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is moderate or substantial, the effect is likely to be considered significant, whilst if the impact is slight or negligible, the impact is likely to be considered not significant. It should be noted that this is a binary judgement of either it is significant or it is not significant.

[11] LA 105 Air Quality, Highways England, 2019.
[12] Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.
[13] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.
[14] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

3.3.2 Potential Development Exposure

The proposed development has the potential to expose future residents to elevated pollution levels. In order to assess NO_2, PM_{10} and $PM_{2.5}$ concentrations across the site, detailed dispersion modelling was undertaken. Reference should be made to Appendix II for assessment input data.

Results of the dispersion modelling were compared against the relevant AQOs and AQLV in order to determine the potential for exposure of future residents to elevated pollutant concentrations and identify any appropriate mitigation, if necessary.

4.0 BASELINE

4.1 Introduction

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

4.2 Local Air Quality Management

As required by the Environment Act (1995), HBC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that concentrations of all pollutants considered within the AQS are currently below the relevant AQOs. As such, no AQMAs have been designated within the borough.

The study of the area also indicate that site sits within administrative boundary of Portsmouth City Council (PCC) and recent ASR[15]

4.3 Air Quality Monitoring

Monitoring of pollutant concentrations is undertaken by HBC throughout their area of jurisdiction. Recent results recorded in the vicinity of the development are shown in Table 11. Exceedences of the AQO are shown in bold.

Table 11 Monitoring Results

Monitoring Site		Monitored NO_2 Concentration (µg/m^3)		
		2017	2018	2019
71	19 Havant Road (HR-19)	--	27.78	25.19
72	60 Northern Road (NR-60)	--	26.49	23.33
73	52 Northern Road (NR-52)	--	27.4	23.78
74	Column 38 Northern Road (NR-Col38)	--	37.27	30.25
75	1-6 Chipstead House Southampton Road	--	25.71	21.25
100	340 Havant Road (HR-340)	--	22.14	19.94
101	Column 52 Havant Road (HR-Col52)	--	28.17	25.00
102	Hillside & Wymering Centre Service Road	--	28.72	23.71
135	Southampton Road - North (SR-N)	--	--	25.73
136	Southampton Road - South (SR-S)	--	42.00	26.67
145	Column 1 Sevenoaks Road (SOR-Col1)	--	--	53.91
146	Column 4 Sevenoaks Road (SOR-Col4)	--	--	26.69
147	Column 146 Southampton Road (SR-Col146)	--	--	26.17
148	Column 147 Southampton Road (SR-Col147)	--	--	24.19
149	Column 154 Southampton Road (SR-Col154)	--	--	33.93
150	Column 155 Southampton Road (SR-Col155)	--	--	37.46
151	Column 171 Southampton Road (SR-Col171)	--	--	31.83
152	Column 172 Southampton Road (SR-Col172)	--	--	41.97
153	Column 177 Southampton Road (SR-Col177)	--	--	36.31
154	Column 178 Southampton Road (SR-Col178)	--	--	43.04
155	Column 78 Southampton Road (SR-Col78)	--	--	35.76
156	Opposite Column2 Church Street (Cs-OCol2)	--	--	35.80
157	106 Eastern Road (ER-106)	--	--	37.33
158	107 Eastern Road (ER-107)	--	--	33.96
159	116 Eastern Road (ER-116)	--	--	39.16

[15] Annual Status Report, Portsmouth City Council- 2022

Monitoring Site		Monitored NO_2 Concentration (µg/m^3)		
		2017	2018	2019
160	117 Eastern Road (ER-117)	40.92		40.92
161	51 Eastern Road (ER-51)	28.49		28.49
162	52 Eastern Road (ER-52)	45.25		45.25
163	Column 2 Allaway Avenue (AA-Col2)	38.56		38.56
164	Column 3 Allaway Avenue (AA-Col3)	34.57		34.57

As shown in Table 11, annual mean NO_2 concentrations were above the AQO at the 19C monitor in 2018 and 2019. As the survey position is located at a kerbside position next to a junction, elevated concentrations are to be expected. Concentrations were below the AQO at all other monitoring locations. Reference should be made to Figure 2 for a map of the survey positions.

It should be noted that pollutant concentrations during 2020 were lower than previous years due to a reduction in road traffic and associated emissions caused by the COVID-19 pandemic. The results should therefore be viewed with caution.

HBC do not undertake PM_{10} or $PM_{2.5}$ monitoring within the vicinity of the development.

4.4 Background Pollutant Concentration Predictions

Predictions of NO_2, PM_{10} and $PM_{2.5}$ concentrations on a 1km by 1km grid basis have been produced by DEFRA. These maps cover 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: 470500, 106500. Data for this location was downloaded from the DEFRA website[16] for the purpose of the assessment and is summarised in Table 12.

Table 12 Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration (µg/m^3)		
	2019	2026	2030
NO_2	17.77	15.82	13.84
PM_{10}	15.69	15.08	14.58
$PM_{2.5}$	11.01	10.13	10.21

As shown in Table 12, predicted background NO_2, PM_{10} and $PM_{2.5}$ concentrations are below the relevant AQOs and AQLV at the development site.

4.5 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 dust and road vehicle exhaust emission impacts in the following Sections.

4.5.1 Construction Phase Sensitive Receptors

Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 13 and Figure 3 within Appendix I.

[16] https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018.

Table 13 Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	10 - 100	0
Up to 50	10 - 100	0
Up to 100	More than 100	-
Up to 350	More than 100	-

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. These are summarised in Table 14.

Table 14 Trackout Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	More than 100	0
Up to 50	More than 100	0

There are no ecological receptors within 50m of the development boundary or the access route within 500m of the site entrance. As such, ecological impacts have not been assessed further within this report.

A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 15.

Table 15 Additional Area Sensitivity Factors to Potential Dust Impacts

Guidance	Comment
Whether there is any history of dust generating activities in the area	The baseline study indicated there a number of industrial facilities to the south of the site. As such, there may be a history of dust generating activities in the area
The likelihood of concurrent dust generating activity on nearby sites	A review of the planning portal indicated the list of developments in considered within this assessment. Forty Acre Farm (APP/18/00450) South Downs College Residential Development (APP/22/00439) Lidl Purbrook Way (APP/20/01221) South Downs College parking reduction (APP/22/00576 It is therefore possible that there will be concurrent dust generation in the area should the development be granted approval and the construction phase overlaps with the proposals
	Trees and shrubs are located along the site boundaries. These may act as a barrier between emission sources and receptors should they be retained during the construction phase
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	As shown in Figure 5, the predominant wind bearing at the site is from the south-west. As such, receptors to the north-east of the boundary are most likely to be affected by dust releases
Conclusions drawn from local topography	There are no significant topographical constraints to dust dispersion
Duration of the potential impact, as a receptor may become more sensitive over	Currently it is unclear the duration of the construction phase. However, it is possible that it will extend over one

Guidance	Comment
time	year. The sensitivity of nearby receptors is unlikely to change during this time
Any known specific receptor sensitivities which go beyond the classifications given in the document	No specific receptor sensitivities identified during the baseline assessment

Based on the criteria shown in Table 4, the sensitivity of the receiving environment to potential dust impacts was determined as high. This was because the identified receptors included residential properties.

The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 3.2, is shown in Table 16.

Table 16 Sensitivity of the Surrounding Area to Potential Dust Impacts

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

4.5.2 Operational Phase Sensitive Receptors

Locations sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study and are summarised in Table 17.

Table 17 Operational Phase Road Vehicle Exhaust Emissions Sensitive Receptor Locations

Receptor		NGR (m)	
		X	Y
R1	8 Downs Close	468799	107203
R2	South Building, South Downs College	468951	107259
R3	Farlington House, Portsdown Hill Road	468765	106263
R4	262 Stakes Hill Road	468512	107747
R5	8 Crookhorn Lane	468477	107653
R6	141 Stakes Road, Nursing Home	468182	107783
R7	150 Hulbert Road	469909	107563
R8	422 purbrook Way	469897	107815
R9	36 Woodsedge	469223	108262
R10	2 Purbrook Way	469870	107762

Reference should be made to Figure 4 for a graphical representation of road vehicle exhaust emission sensitive receptor locations.

1.0 ASSESSMENT

5.1 Introduction

The proposed development has the potential to cause air quality impacts during the construction and operational phases as well as expose future residents to elevated pollution levels due to the proximity of the site to the A27 and associated emissions. These factors are assessed in the following Sections.

5.2 Construction Phase

5.2.1 Step 1

The undertaking of activities such as 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 re-suspension of dust from haul roads and highway surfaces.

The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.

The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 350m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

5.2.2 Step 2

5.2.2.1 Earthworks

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The area of the proposed development site is greater than 10,000m^2. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks activities is therefore large.

Table 16 indicates the sensitivity of the area to dust soiling effects on people and property is high. In accordance with the criteria outlined in Table 8, the development is considered to be a high risk site for dust soiling as a result of earthworks.

Table 16 indicates the sensitivity of the area to human health impacts is low. In accordance with the criteria outlined in Table 8, the development is considered to be a low risk site for human health impacts as a result of earthworks.

5.2.2.2 Construction

Due to the size of the development, the total building volume is likely to be between 25,000m^3 and 100,000m^2. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore medium.

Table 16 indicates the sensitivity of the area to dust soiling effects on people and property is high. In accordance with the criteria outlined in Table 8, the development is considered to be a medium risk site for dust soiling as a result of construction activities.

Table 16 indicates the sensitivity of the area to human health impacts is low. In accordance with the criteria outlined in Table 8, the development is considered to be a low risk site for human health impacts as a result of construction activities.

5.2.2.3 Trackout

Based on the site area and existing hardstanding, it is anticipated that the unpaved road length is likely to be greater than 50m. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from trackout is therefore large.

Table 16 indicates the sensitivity of the area to dust soiling effects to people and property is high. In accordance with the criteria outlined in Table 9, the development is considered to be a low risk site for dust soiling as a result of trackout activities.

Table 16 indicates the sensitivity of the area to human health impacts is medium. In accordance with the criteria outlined in Table 9, the development is considered to be a medium risk site for human health impacts as a result of trackout activities.

5.2.2.4 Summary of the Risk of Dust Effects

A summary of the risk from each dust generating activity is provided in Table 18.

Table 18 Summary of Potential Unmitigated Dust Risks

Potential Impact	Risk		
	Earthworks	Construction	Trackout
Dust Soiling	High	Medium	High
Human Health	Low	Low	Medium

As indicated in Table 18, the potential risk of dust soiling is high from earthworks and trackout and medium from construction. The potential risk of human health impacts is medium from trackout and low from earthworks and construction.

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.

5.2.3 Step 3

The IAQM guidance[17] provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the development site as summarised in Table 19. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan or similar if required by the HBC.

Table 19 Fugitive Dust Emission Mitigation Measures

Issue	Comment
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

[17] Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

Issue	Comment
	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 LA
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 LA upon request Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised
Monitoring	Undertake daily on-site and off-site inspection to monitor dust, record inspection results, and make the log available to the LA upon request Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the LA upon request Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
Site preparation	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 they are active for an extensive 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 Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary - no idling vehicles Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate Use enclosed chutes and conveyors and covered skips Minimise drop heights and use fine water sprays wherever appropriate Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods
Waste management	Avoid bonfires or burning of waste materials
Earthworks	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 cover in small areas during work and not all at once
Construction	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

Issue	Comment
	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 powder materials ensure bags are sealed after use and stored appropriately to prevent dust
Trackout	Use water-assisted dust sweeper on access and local roads, if required Avoid dry sweeping of large areas Ensure vehicles entering and leaving site are covered to prevent escape of materials Record all inspections of haul routes and any subsequent action in a site log book Inspect haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably possible Implement a wheel washing system, if required 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

5.2.4 Step 4

Assuming the relevant mitigation measures outlined in Table 19 are implemented, the residual impacts from all dust generating activities is predicted to be not significant, in accordance with the IAQM guidance[18].

5.3 Operational Phase

Vehicle movements associated with the operation of the proposal will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations.

The assessment considered the following scenarios:

- 2019 - Verification;
- 2033 – DM (Baseline +Committed development); and
- 2033 – DS (Baseline+ Committed Development+ Campdown Development).

The DM scenario (i.e. without development) included anticipated baseline traffic data and committed developments, inclusive of anticipated growth for the relevant assessment year. The DS scenario (i.e. with development) included anticipated baseline traffic data, inclusive of anticipated growth for the relevant assessment year, in addition to predicted vehicle trips associated with the operation of the proposals.

For the purpose of the assessment traffic data for 2033 was utilised as the development opening year including baseline, committed developments and the development itself. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emissions factors for 2019 were utilised within the dispersion model. The use of 2033 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.

5.3.1 Potential Future Impacts

5.3.1.1 Predicted Concentrations

Annual mean NO_2 concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 20.

[18] Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

Table 20 Predicted Annual Mean NO_2 Concentrations

Receptor		Predicted Annual Mean NO_2 Concentration (µg/m^3)		
		DM	DS	Change
R1	8 Downs Close	15.50	16.30	0.80
R2	South Building, South Downs College	15.59	16.04	0.45
R3	Farlington House, Portsdown Hill Road	16.96	17.06	0.10
R4	262 Stakes Hill Road	17.81	18.15	0.34
R5	8 Crookhorn Lane	16.68	17.07	0.39
R6	141 Stakes Road, Nursing Home	17.47	17.71	0.24
R7	150 Hulbert Road	20.11	20.24	0.13
R8	422 purbrook Way	20.84	21.08	0.24
R9	36 Woodsedge	18.32	18.44	0.12
R10	2 Purbrook Way	20.76	20.98	0.22

As indicated in Table 20, predicted annual mean NO_2 concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

Reference should be made to Figure 6 for graphical representations of annual mean NO_2 concentrations for the DS scenario.

Annual mean PM_{10} concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 21.

Table 21 Predicted Annual Mean PM_{10} Concentrations

Receptor		Predicted Annual Mean PM_{10} Concentration (µg/m^3)		
		DM	DS	Change
R1	8 Downs Close	15.11	15.24	0.13
R2	South Building, South Downs College	15.12	15.20	0.08
R3	Farlington House, Portsdown Hill Road	14.94	14.95	0.02
R4	262 Stakes Hill Road	15.45	15.51	0.05
R5	8 Crookhorn Lane	15.28	15.34	0.06
R6	141 Stakes Road, Nursing Home	15.45	15.49	0.04
R7	150 Hulbert Road	15.94	15.96	0.02
R8	422 purbrook Way	16.03	16.07	0.04
R9	36 Woodsedge	15.67	15.69	0.02
R10	2 Purbrook Way	16.01	16.05	0.04

As indicated in Table 21, predicted annual mean PM_{10} concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

Reference should be made to Figure 7 for graphical representations of annual mean PM_{10} concentrations for the scenario.

Annual mean $PM_{2.5}$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 20

Table 20 Predicted Annual Mean $PM_{2.5}$ Concentrations

Receptor		Predicted Annual Mean PM10 Concentration (µg/m3)		
		DM	DS	Change
R1	8 Downs Close	11.08	11.09	0.01

R2	South Building, South Downs College	11.09	11.09	0.01
R3	Farlington House, Portsdown Hill Road	11.15	11.17	0.02
R4	262 Stakes Hill Road	11.27	11.30	0.03
R5	8 Crookhorn Lane	11.17	11.20	0.03
R6	141 Stakes Road, Nursing Home	11.26	11.30	0.04
R7	150 Hulbert Road	11.22	11.23	0.01
R8	422 Purbrook Way	11.27	11.28	0.02
R9	36 Woodsedge	11.14	11.15	0.01
R10	2 Purbrook Way	11.25	11.27	0.03

As indicated in Table 21, predicted annual mean $PM_{2.5}$ concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

Reference should be made to Figure 8 within Appendix-II for graphical representations of annual mean $PM_{2.5}$ concentrations for the scenario.

5.3.1.2 Predicted Impacts

Predicted impacts on annual mean NO_2 concentrations at the sensitive receptor locations are summarised in Table 22.

Table 22 Predicted Impacts - NO_2

Receptor		Predicted Annual Mean NO_2 Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	8 Downs Close	75% or Less of the AQO	2.00	Negligible
R2	South Building, South Downs College	75% or Less of the AQO	1.13	Negligible
R3	Farlington House, Portsdown Hill Road	75% or Less of the AQO	0.25	Negligible
R4	262 Stakes Hill Road	75% or Less of the AQO	0.85	Negligible
R5	8 Crookhorn Lane	75% or Less of the AQO	0.98	Negligible
R6	141 Stakes Road, Nursing Home	75% or Less of the AQO	0.60	Negligible
R7	150 Hulbert Road	75% or Less of the AQO	0.32	Negligible
R8	422 purbrook Way	75% or Less of the AQO	0.60	Negligible
R9	36 Woodsedge	75% or Less of the AQO	0.30	Negligible
R10	2 Purbrook Way	75% or Less of the AQO	0.55	Negligible

As indicated in Table 22, impacts on annual mean NO_2 concentrations as a result of the proposed development were predicted to be negligible at all receptor locations.

Predicted impacts on annual mean PM_{10} concentrations at the sensitive receptor locations are summarised in Table 23.

Table 23 Predicted Impacts - PM_{10}

Receptor		Predicted Annual Mean PM_{10} Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	8 Downs Close	Below 75% of AQO	0.24	Negligible
R2	South Building, South Downs College	Below 75% of AQO	0.14	Negligible
R3	Farlington House, Portsdown Hill Road	Below 75% of AQO	0.03	Negligible
R4	262 Stakes Hill Road	Below 75% of AQO	0.10	Negligible
R5	8 Crookhorn Lane	Below 75% of AQO	0.11	Negligible
R6	141 Stakes Road, Nursing Home	Below 75% of AQO	0.10	Negligible
R7	150 Hulbert Road	Below 75% of AQO	0.04	Negligible
R8	422 purbrook Way	Below 75% of AQO	0.07	Negligible
R9	36 Woodsedge	Below 75% of AQO	0.04	Negligible
R10	2 Purbrook Way	Below 75% of AQO	0.07	Negligible

As indicated in Table 23, impacts on annual mean PM_{10} concentrations as a result of the proposed development were predicted to be negligible at all receptor locations.

Predicted impacts on annual mean $PM_{2.5}$ concentrations at the sensitive receptor locations are summarised in Table 23.

Table 24 Predicted Impacts - $PM_{2.5}$

Receptor		Predicted Annual Mean PM_{10} Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	8 Downs Close	Below 75% of AQO	0.11	Negligible
R2	South Building, South Downs College	Below 75% of AQO	0.06	Negligible
R3	Farlington House, Portsdown Hill Road	Below 75% of AQO	0.17	Negligible
R4	262 Stakes Hill Road	Below 75% of AQO	0.33	Negligible
R5	8 Crookhorn Lane	Below 75% of AQO	0.27	Negligible
R6	141 Stakes Road, Nursing Home	Below 75% of AQO	0.40	Negligible
R7	150 Hulbert Road	Below 75% of AQO	0.08	Negligible
R8	422 purbrook Way	Below 75% of AQO	0.19	Negligible
R9	36 Woodsedge	Below 75% of AQO	0.11	Negligible
R10	2 Purbrook Way	Below 75% of AQO	0.25	Negligible

As indicated in Table 23, impacts on annual mean $PM_{2.5}$ concentrations as a result of the proposed development were predicted to be negligible at all receptor locations.

5.3.2 Potential Development Exposure

The proposed development has the potential to cause the exposure of future residents to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs described in Appendix II to quantify air quality conditions at the site. Reference should be made to Figures 6, 7 and 8 for graphical representations of predicted annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations, respectively.

As shown in Figure 6, annual mean NO_2 concentrations were predicted to be below the AQO of 40 $\mu g/m^3$ at all locations across the site. The maximum level at the boundary remained 24.72 $\mu g/m^3$ towards the A3 (M).

However, the development will be far away from the A3 (M) and therefore it is predicted that future residents will not be affected by the poor Air Quality levels.

As shown in Figure 7, annual mean PM_{10} concentrations were predicted to be below the AQO of 40 µg/m^3 at all locations across the site. The maximum level at the boundary remains 16.97 µg/m^3 toward A3 (M).

As shown in Figure 8, annual mean $PM_{2.5}$ concentrations were predicted to be below the AQO of 25 µg/m^3 at all locations across the site. The maximum level at the boundary remains 11.57 µg/m^3 toward A3 (M).

This should be noted that predicted pollutant concentration is below the AQO levels for all the pollutants as the traffic data for 2033 was used with 2019 emission, this determines the confidence that real life level will be below these values.

Based on the assessment results, future residents are not predicted to be exposed to pollutant concentrations above the relevant AQOs and AQLV. As such, the site is considered suitable for the proposed use from an air quality perspective.

5.3.3 Overall Impact Significance

The overall significance of road traffic emission impacts was determined as negligible. This was based on the overall predicted impacts at discrete receptor locations and the considerations outlined previously. Further justification is provided in Table 25.

Table 25 Overall Impact Significance of Road Vehicle Exhaust Emission Impacts

Guidance	Comment
The existing and future air quality in the absence of the development	Predicted annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were below the relevant AQOs and AQLV at all sensitive receptors in the DM and DS scenarios. It is considered unlikely that future air quality conditions will change significantly in the future.
The extent of current and future population exposure to the impacts	The development is not predicted to affect the population exposed to exceedances of the AQOs or AQLV
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	The assessment assumed that vehicle exhaust emission rates will not reduce in future years. This provides worst-case results when compared with DEFRA and National Highways methodologies. Due to the adopted assumptions, it is considered the presented results are sufficiently robust for an assessment of this nature

The IAQM guidance[19] states that only if the impact is greater than slight, the effect is considered significant. As impacts were predicted to be negligible, overall effects are considered not significant, in accordance with the stated methodology.

5.4 Best Practice Measures

[19] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

5.4.1 Construction Phase

The IAQM guidance[20] provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the proposals as summarised in Table 19. These may be reviewed prior to the commencement of construction works and incorporated into the Construction Environmental Management Plan (CEMP) if required by the HBC.

5.4.2 Operational Phase

The assessment has shown that impacts associated with vehicle exhaust emissions produced by the development are predicted to be negligible. Concentration of relevant pollutants levels, NO_2, PM_{10} and $PM_{2.5}$ as indicated above remains below the Air Quality Objectives (AQO) at the proposed site and as such no mitigations are required.

However, the following measures have been identified for inclusion within the proposals in accordance with the IAQM 'Land-Use Planning & Development Control: Planning for Air Quality' guidance and HBC's local policies:

- Provision of cycle parking in line with HBC's Parking SPD[21];
- Electric Vehicle charging to be provided for all units.
- Direct pedestrian links from the site to existing footways by means of suitable footpaths and dropped kerb pedestrian crossings to promote walking as a sustainable transport method.
- Instigation of a bicycle user group for the development.
- Provision of a residents' travel information pack, outlining public transport routes and facilities.
- Promotion of car sharing schemes and the Hampshire car share website.
- Establishment of a community travel webpage (Facebook or similar), this will contain up to date bus and rail timetables, detail of car share schemes and walking and cycling facilities maps; and,
- Travel pack to include financial contributions towards cycle purchases, bike ability training and bus travel.

The implementation of the above measures will assist with minimising air quality effects as a result of construction dust and vehicle exhaust emissions.

[20] Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2017.
[21] Havant Borough Council Parking Supplementary Planning Document, HBC, 2016.

2.0 SUMMARY

Omnia was commissioned by Dandara Homes Ltd to undertake an Air Quality Impact Assessment in support a planning application for a residential development at Campdown, Purbrook, PO7 8AA.

The proposals comprise a residential development along with car park and associated infrastructure.

The proposals have the potential to cause air quality impacts at sensitive locations. These may include fugitive dust emissions during construction and road traffic exhaust emissions from vehicles travelling to and from the site during operation. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions and assess potential effects associated with the scheme.

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[22] methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by earthworks, construction and trackout activities was predicted to be not significant.

Potential impacts during the operational phase of the proposals may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the site. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the local highway network both with and without the development in place. Results were subsequently verified using local monitoring data. Cumulative impacts associated with nearby gas generating plants were also considered as necessary.

Review of the dispersion modelling results indicated that impacts on annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations as a result of traffic generated by the development were predicted to be negligible at all receptor locations.

The results of the dispersion modelling assessment also indicated that predicted annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were below the relevant AQOs and AQLV at all locations across the development. The site is therefore considered suitable for the proposed use from an air quality perspective.

Following consideration of the relevant issues, residual impacts as a result of the operation of the development were considered to be not significant, in accordance with the IAQM guidance.

Although impacts were predicted to be not significant, a number of mitigation measures were identified in order to further reduce vehicle exhaust emissions associated with the development. This will minimise effects as a result of the development in accordance with the requirements of HBC.

Based on the assessment results, air quality factors are not considered a constraint to planning consent for the development.

[22] Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

2.0 ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do-Minimum
DMRB	Design Manual for Roads and Bridges
DMP	Dust Management Plan
DS	Do-Something
EB	Eastbound
EFT	Emission Factor Toolkit
EQS	Environmental Quality Standard
HBC	Havant Borough Council
PCC	Portsmouth City Council
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
NB	Northbound
NGR	National Grid Reference
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PC	Process Contribution
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10µm
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5µm
SB	Southbound
SP	Slow Phase
WB	Westbound
z_0	Roughness length

APPENDIX I

Drawings

Legend

Site Boundary

Title

Site Boundary

Client

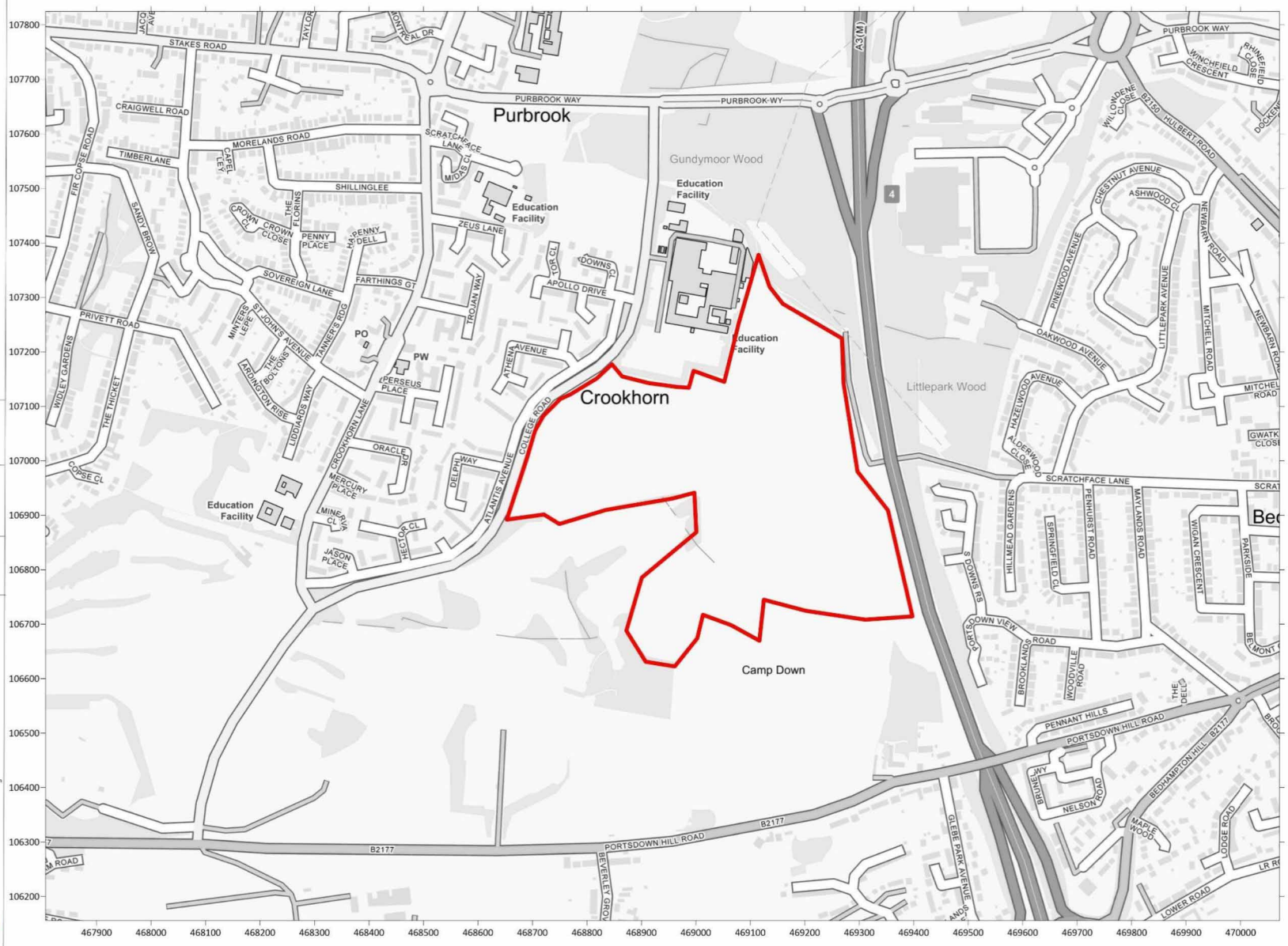
Dandara Southern Ltd.

Project

C010785

Project Name

Campdown, Purbrook, PO7 8AA



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N

Legend

Site Boundary

Diffusion Tube Monitoirng Location

Title

Diffusion Tube Monitoring

Client

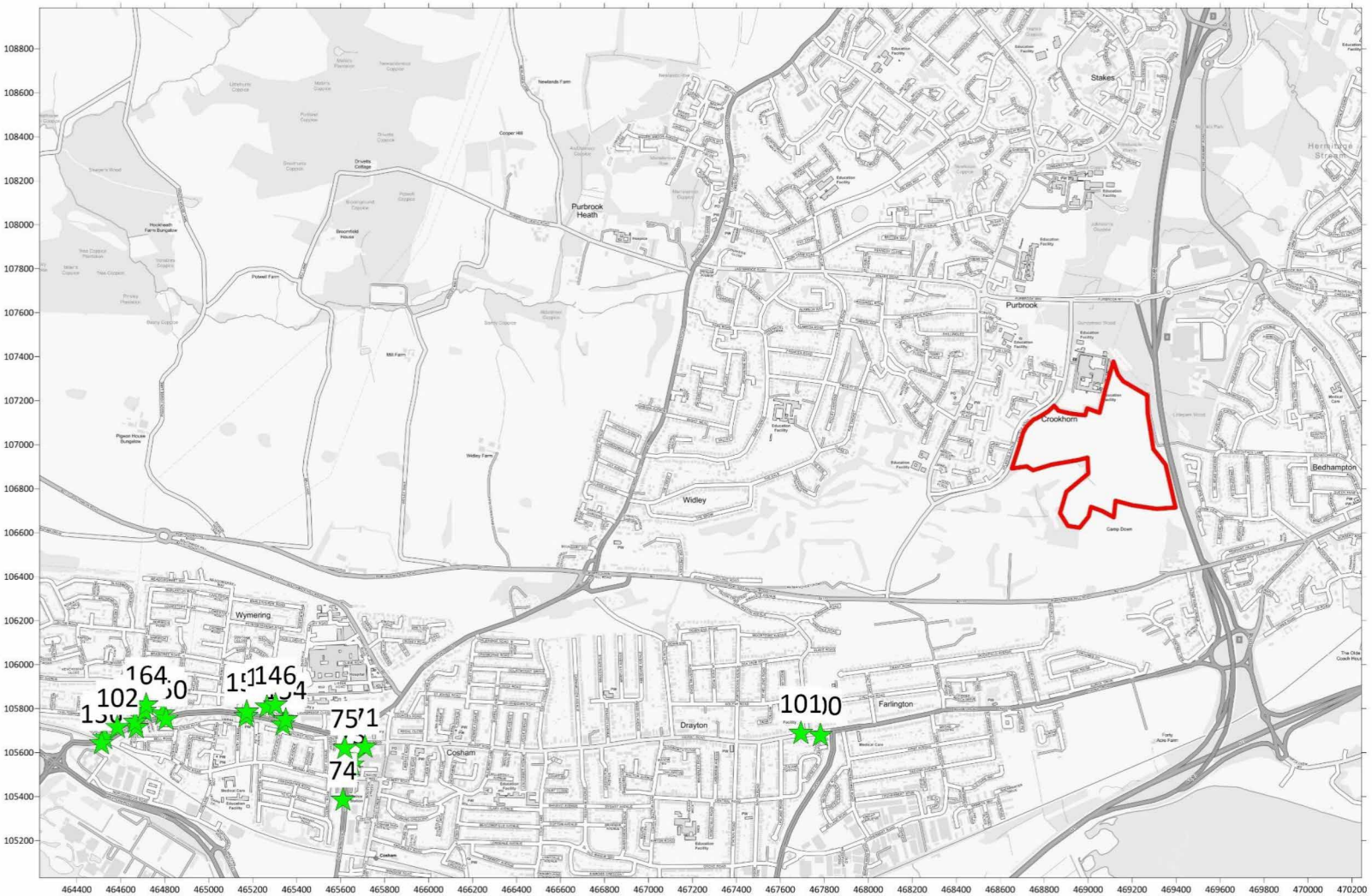
Dandara Southern Ltd.

Project

C010785

Project Name

Campdown, Purbrook, PO7 8AA



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N

Legend

- Site Boundary
- 20 m Buffer Radius
- 50 m Buffer Radius
- 100 m Buffer Radius
- 350 m Buffer Radius

Title
Earthworks and Construction
Dust Buffer Zones

Client
Dandara Southern Ltd.

Project
C010785

Project Name
Campdown, Purbrook, PO7 8AA

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N

Legend

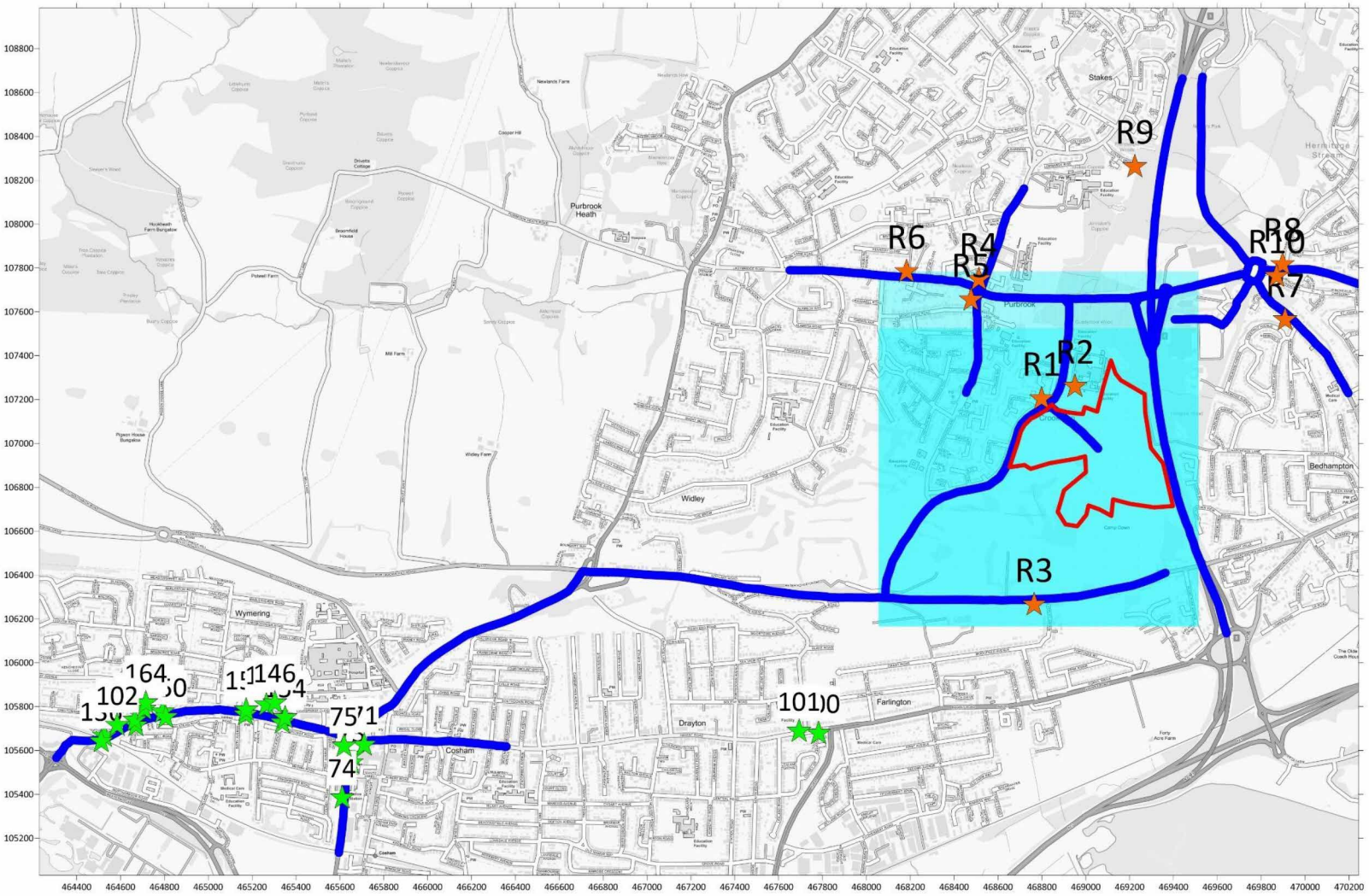
- Site Boundary
- Modelled Road Link
- Cartesian Grid
- Diffusion Tube Monitoirng Location
- Sensitive Receptor Locations

Title
ADMS-Roads Input

Client
Dandara Southern Ltd.

Project
C010785

Project Name
Campdown, Purbrook, PO7 8AA



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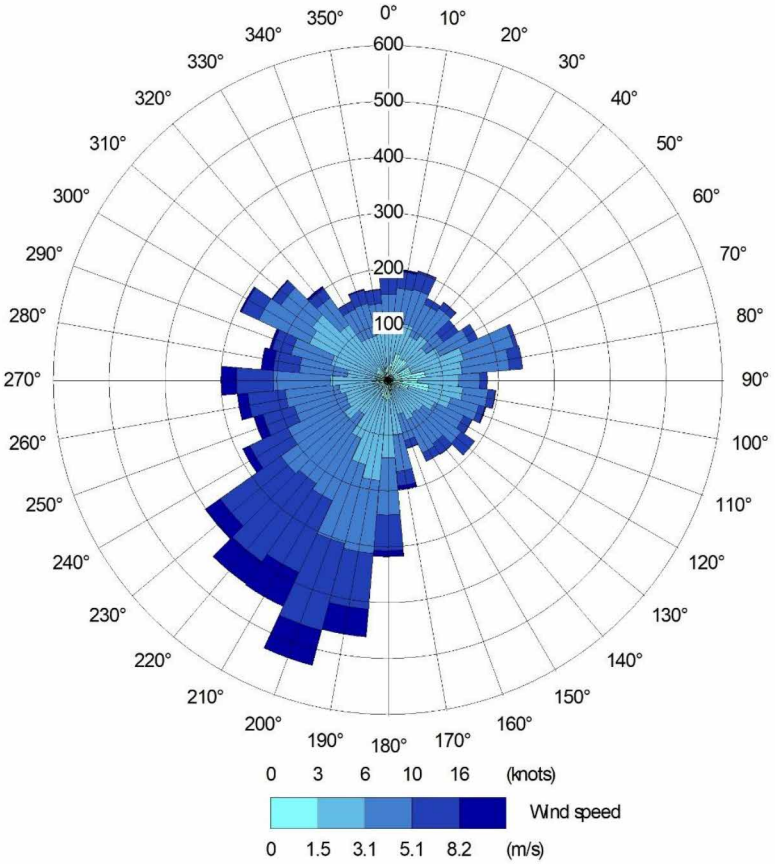

Title
Wind Rose 2019 Southampton Airport
Meteorological Station

Client
Dandara Southern Ltd.

Project
C010785

Project Name
Campdown, Purbrook, PO7 8AA

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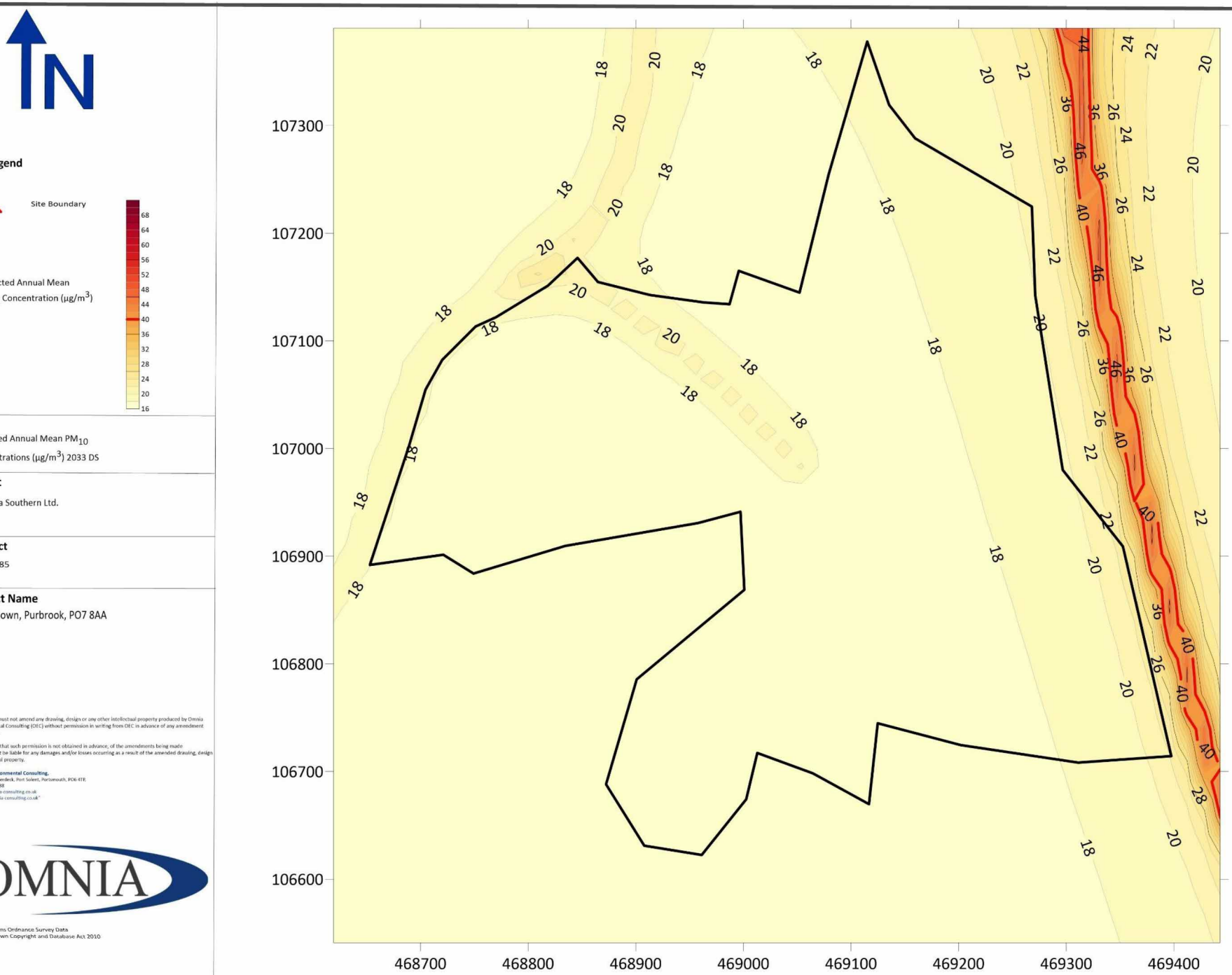

Legend

Site Boundary

Predicted Annual Mean PM_{10} Concentration ($\mu g/m^3$)

68, 64, 60, 56, 52, 48, 44, 40, 36, 32, 28, 24, 20, 16

Title

Predicted Annual Mean PM_{10} Concentrations ($\mu g/m^3$) 2033 DS

Client

Dandara Southern Ltd.

Project

C010785

Project Name

Campdown, Purbrook, PO7 8AA

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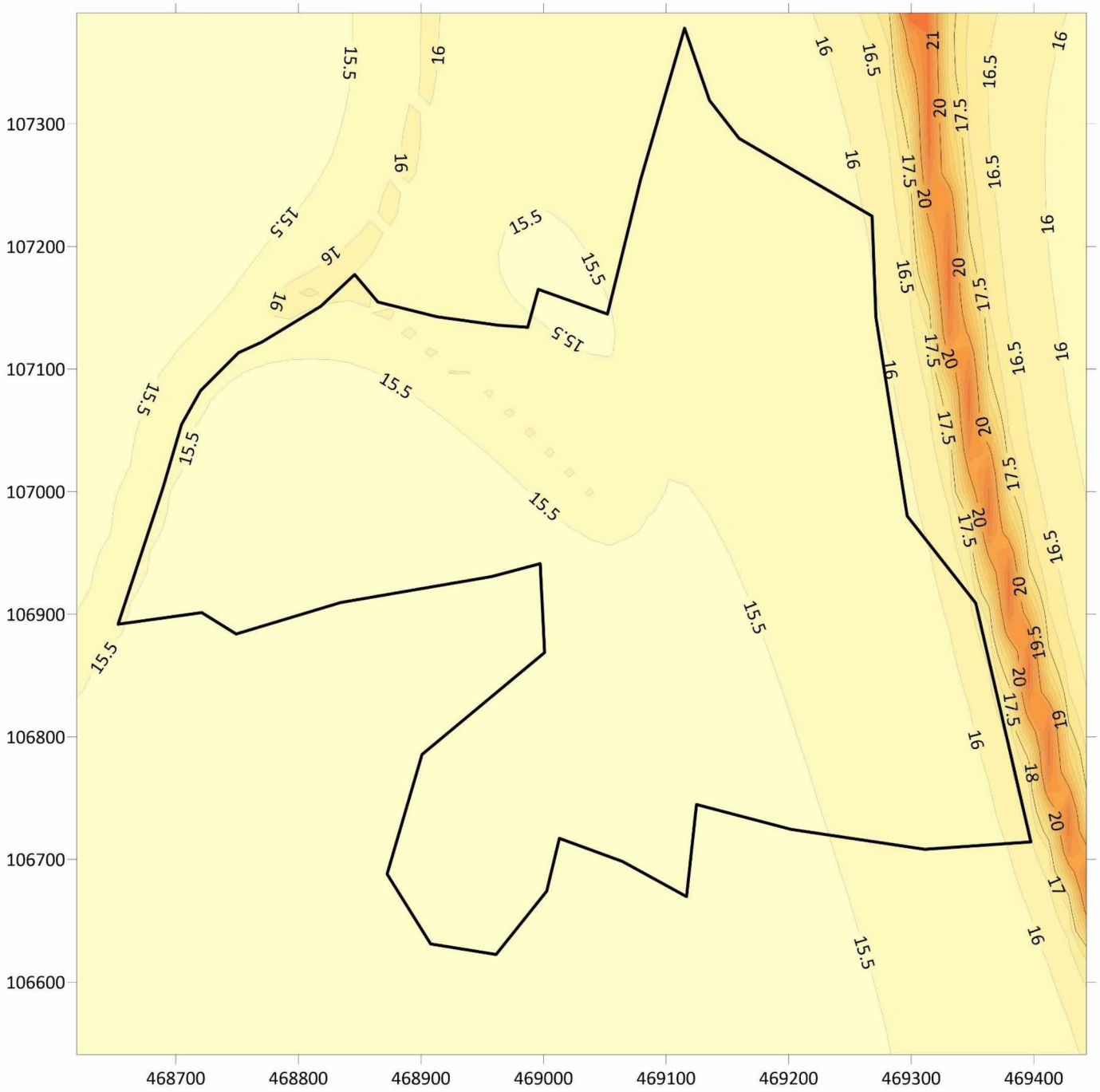

Legend

Site Boundary

Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$)

27.5, 27, 26.5, 26, 25.5, 25, 24.5, 24, 23.5, 23, 22.5, 22, 21.5, 21, 20.5, 20, 19.5, 19, 18.5, 18, 17.5, 17, 16.5, 16, 15.5, 15

Title

Predicted Annual Mean NO_2 Concentrations ($\mu g/m^3$) 2033 DS

Client

Dandara Southern Ltd.

Project

C010785

Project Name

Campdown, Purbrook, PO7 8AA

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APPENDIX II

Assessment Input Data

Introduction

The proposed development has the potential cause air quality impacts as a result of exhaust emissions associated with vehicles travelling to and from the development, as well as expose future residents to any existing air quality issues at the site. In order to assess NO_2, PM_{10} and $PM_{2.5}$ concentrations at sensitive locations, detailed dispersion modelling was undertaken in accordance with the following methodology.

Dispersion Model

Dispersion modelling was undertaken using the ADMS-Road's dispersion model (version 5.0.1.3). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

Modelling was undertaken for 2019 to allow verification against recent monitoring results and 2033 to represent the development opening year.

The model requires input data that details the following parameters:

- Assessment area;
- Traffic flow data;
- Vehicle emission factors;
- Spatial co-ordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length (z_0); and,
- Monin-Obukhov length.

The relevant inputs are detailed in the following Sections.

Assessment Area

Ambient concentrations were predicted over NGR: 468060, to 106170 and 469510 to 107780. One Cartesian grid was used within the model to produce data suitable for contour plotting using the Surfer software package.

Reference should be made to Figure 4 for a graphical representation of the assessment grid extents.

Receptors potentially sensitive to changes in pollutant concentrations were included in the assessment as outlined in the main report text.

Traffic Flow Data

Traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition as HDV proportion, was provided by Paul Basham Associates, the Transport Consultants for the project.

Baseline traffic data for the Southampton Road, A3, A397 and Havant Road was not available from the Transport Consultants and was therefore supplemented with information from the Department for Transport (DfT)[23]. The DfT web tool enables the user to view and download traffic flows on every link of the 'A' road and motorway network, as well as selected minor roads, in Great Britain for the years 1999 to 2021. It should be noted that the DfT web tool is referenced in DEFRA guidance[24] as being a suitable source of data for air quality assessments and it is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the site.

[23] https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints.
[24] Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

The baseline traffic data for the monitoring locations was converted to the site opening year utilising a factor obtained from TEMPro (Version 8.0). This software package has been developed by the DfT to calculate future traffic growth throughout the UK.

Road widths were estimated from aerial photography and UK highway design standards. A summary of the traffic data used in the assessment is provided in Table A1.1.

Table A1.1 Traffic Data

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Mean Vehicle Speed (km/h)
		2019	2033 DM	2033 DS			
L1	Southampton Road West	23,820	25,946	26,446	1.5	12.6	35
L2	Southampton Road Bridge	23,820	25,946	26,446	1.5	13.9	25
L3	Southampton Road/ Allway Avenue	23,820	25,946	26,446	1.5	13.5	20
L4	Southampton Road	23,820	25,946	26,446	1.5	13.2	15
L5	Southampton Road/ Sixth Avenue	23,820	25,946	26,446	1.5	15.5	25
L6	Southamton Road/ Sundridge Close	23,820	25,946	26,446	1.5	13.5	20
L7	Spur Road Junction	23,820	25,946	26,446	1.5	14.2	25
L8	Roundabout1	19,855	21,626	22,126	2.3	15.2	25
L9	London Road	21,315	23,217	23,717	2.3	14.5	20
L10	London Road (A3)	21,315	23,217	23,717	2.3	15.2	35
L11	Northern Road	20,641	22,483	22,983	2.3	15.5	20
L12	Northern Road (A937)	20,641	22,483	22,983	2.3	15.2	25
L13	Spur Road	13,643	14,860	15,360	1.7	13.2	25
L14	Spur Road/ Lodge Avenue Road	13,643	14,860	15,360	1.7	13.5	35
L15	Hulbert Road North	7,365	8,543	8,880	2.3	10.3	35
L16	Hulbert Road Roundabout	7,365	8,543	8,880	2.3	11.2	25
L17	Roundbaout2	6,833	7,443	7,943	1.7	12.2	20
L18	Purbrook Way/ Farm Way	6,909	7,695	8,418	1.7	14.5	25
L19	Purbrook Way/ Linkenholt Way	6,909	7,695	8,418	2.3	14.2	35
L20	Hulbert Road South	8,193	9,457	9,794	2.3	15.2	25
L21	Hulbert Road (B2150)	8,193	9,457	9,794	1.7	14.5	40
L22	ASDA Link	1197	1,925	3,323	1.7	13.2	25
L23	Purbrook Way/ A3	17,840	19,767	20,489	2.3	15.2	25
L24	Purbrook Way East Slips	17,840	19,767	20,489	2.3	14.5	30
L25	Roundabout 3	13,483	14,687	15,187	1.7	13.5	25
L26	A3 Slip on	10,494	12,257	14,377	3.8	16.2	40
L27	Purbrook Way	12,117	14,115	16,957	3.8	13.5	30
L28	Roundabout 4	11,396	12,412	14,532	3.8	15.2	25
L29	A3 Slip off	11,706	13,596	15,716	3.8	16.2	35
L30	A3 South Merger	43,143	47,903	50,023	3.8	18.8	40
L31	A3 South	43,143	47,903	50,023	3.8	18.2	45
L32	A3 South Roundabout	43,143	47,903	50,023	3.8	18.5	50
L33	A3 (M North)	42,119	46,771	48,891	3.8	18.5	45
L34	A3 (M)	42,119	46,771	48,891	3.8	18.2	50
L35	Purbrook Way	10,364	12,178	15,021	1.7	15.5	35
L36	Purbrrok Way/ College Road	10,364	12,178	15,021	1.7	15.2	35
L37	Purbrook Roundabout	10,364	12,178	15,021	3.8	15.7	25
L38	Roundabout 5	7,555	8,230	8,856	3.8	16.2	20
L39	Stakes Hill Road North	8,024	8,917	9,544	3.8	15.5	25
L40	Stakes Hill Road	8,024	8,917	9,544	3.8	14.7	40
L41	Purbrook Way West	10,637	12,312	13,275	3.8	15.5	25

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Mean Vehicle Speed (km/h)
		2019	2033 DM	2033 DS			
L42	Ladybridge West	10,637	12,312	13,275	3.8	15.2	35
L43	Crook Horn Lane South	1,197	1,925	3,323	3.8	14.2	25
L44	Crook Horn Lane	1,556	2,143	3,155	3.8	13.5	35
L45	College Road	1,193	1,743	5,549	1.7	14.2	30
L46	College Road South	1,555	2,143	3,155	1.7	13.5	30
L47	Site Acess	10	40	4,818	0.5	12.5	25
L48	Portsdown Hill Road East	7,085	7,929	8,363	0.5	14.5	30
L49	Porstdown Hill Road	7,072	7,928	8,506	3.8	14.2	35
L50	London Road South	21,315	23,217	23,717	3.8	10.3	35

Reference should be made to Figure 4 for a graphicsssssal representation of the road link locations.

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 11.0). This has been produced by DEFRA and incorporates COPERT 5.3 vehicle emission factors and fleet information.

There is current uncertainty over NO_2 concentrations within the UK, with the implementation of new vehicle emission standards not resulting in the previously expected reduction in roadside levels. Therefore, 2019 emission factors were utilised in preference to the development opening year in order to provide robust model outputs. As predictions for 2019 were verified, it is considered the results are a robust indication of worst case concentrations for the future year.

Meteorological Data

Meteorological data used in the assessment was taken from Southampton Airport meteorological station over the period 1st January 2019 to 31st December 2019 (inclusive). Southampton Airport is located at NGR: 444992, 116764 which is approximately 27.8km north-west of the development. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 5 for a wind rose of utilised meteorological data.

Roughness Length

The z_0 is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 of 0.5m was used to describe the modelling extents and the meteorological site. This value is considered appropriate for the morphology of both areas and is suggested within ADMS-Roads as being suitable for 'parkland, open suburbia'.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used to describe the modelling extents. This value is considered appropriate for the nature of the area and is suggested within ADMS-Roads as being suitable for 'cities and large towns'.

A minimum Monin-Obukhov length of 10m was used to describe the meteorological site. This value is considered appropriate for the nature of the area and is suggested within ADMS-Roads as being suitable for 'small towns <50,000".

Background Concentrations

Annual mean NO_2, PM_{10} and $PM_{2.5}$ background concentrations for use in this assessment were taken from the DEFRA mapping study for the grid square containing the site, as shown in Table 12.

NO_x to NO_2 Conversion

Predicted annual mean oxides of nitrogen (NO_x) concentrations were converted to NO_2 concentrations using the spreadsheet (version 8.1) provided by DEFRA, which is the method detailed within DEFRA guidance[25].

Verification

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions;
- Overall model limitations; and,
- Uncertainties associated with monitoring data, including locations.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

For the purpose of this assessment model verification was undertaken for 2019 using traffic data, meteorological data, and monitoring results from this year. The choice of 2019 as the verification year aligns with the IAQM position statement 'Use of 2020 and 2021 Monitoring Datasets'[26], which states:

> "If you are carrying out an air quality study that includes validation against monitoring data, use 2019 monitoring data as the last typical year"

HBC monitoring data was not representative of the site, however, PCC undertook monitoring of NO_2 concentrations at several locations near the site suitable for model verification during 2019. The results were obtained and the road contribution to total NO_x concentration calculated following the methodology contained within DEFRA guidance[27]. The monitored annual mean NO_2 concentrations and calculated road NO_x concentrations are summarised in Table A1.2.

Table A1.2 Verification - Monitoring Result

Monitoring Location		Monitored NO_2 Concentration ($\mu g/m^3$)	Calculated Road NO_2 Concentration ($\mu g/m^3$)
2	Rectory Road	22.3	8.57
72	60 Northern Road (NR-60)	23.8	29.42
73	52 Northern Road (NR-52)	30.3	28.65
135	Southampton Road - North (SR-N)	25.7	37.04

[25] Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.
[26] Use of 2020 and 2021 Monitoring Datasets, IAQM, 2021.
[27] Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

Monitoring Location		Monitored NO_2 Concentration ($\mu g/m^3$)	Calculated Road NO_2 Concentration ($\mu g/m^3$)
136	Southampton Road - South (SR-S)	26.7	32.35
147	Column 146 Southampton Road (SR-Col146)	26.2	31.94
148	Column 147 Southampton Road (SR-Col147)	24.2	35.33
149	Column 154 Southampton Road (SR-Col154)	33.9	31.36
150	Column 155 Southampton Road (SR-Col155)	37.5	32.92
151	Column 171 Southampton Road (SR-Col171)	31.8	30.48
152	Column 172 Southampton Road (SR-Col172)	42.0	32.22
153	Column 177 Southampton Road (SR-Col177)	36.3	29.31
154	Column 178 Southampton Road (SR-Col178)	43.0	31.22

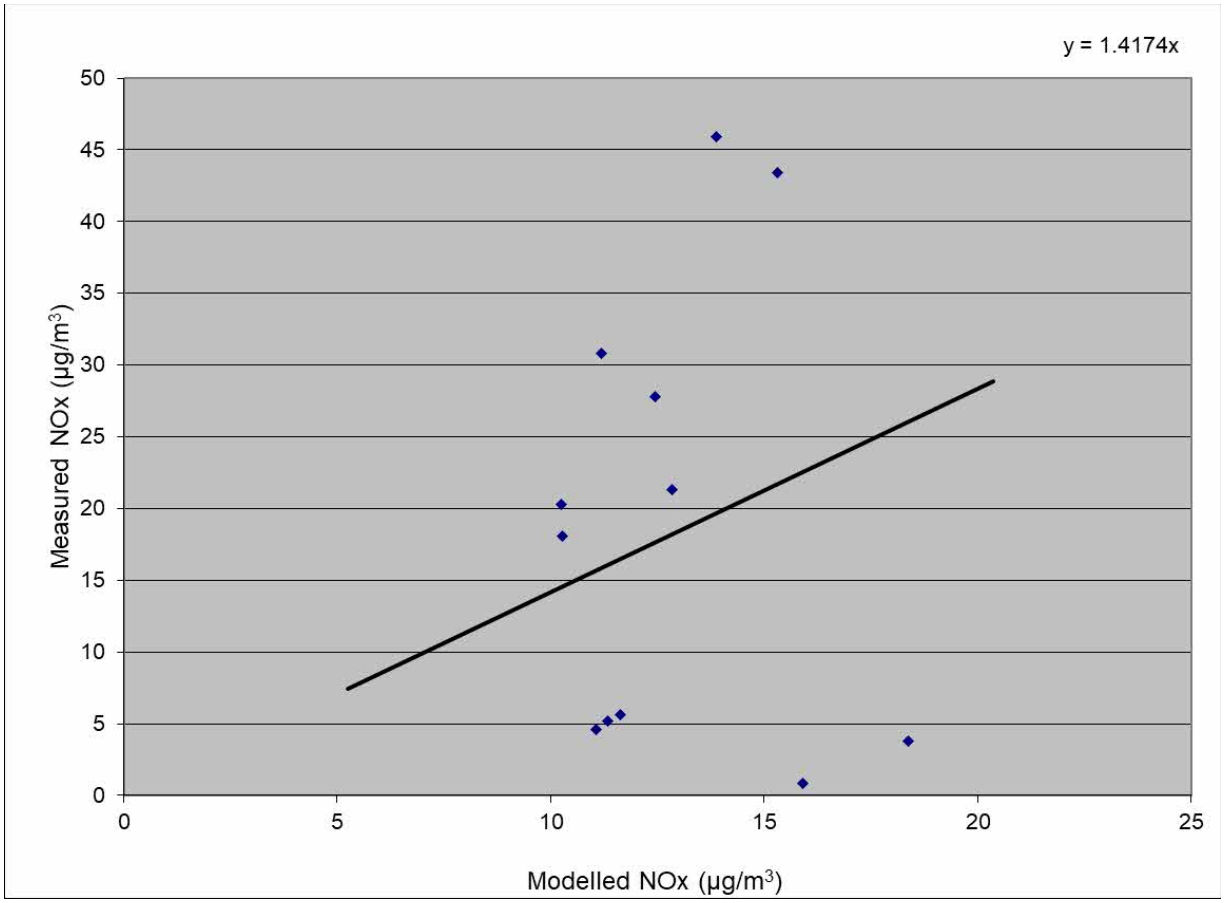
The annual mean road NO_x concentrations predicted from the dispersion model and the 2019 road NO_x concentrations calculated from the monitoring results are summarised in Table A1.3.

Table A1.3 Verification - Modelling Results

Monitoring Location		Calculated Road NOx Concentration (µg/m3)	Modelled Road NOx Concentration (µg/m3)
72	Rectory Road	15.96	11.34
73	60 Northern Road (NR-60)	14.46	10.27
135	52 Northern Road (NR-52)	25.86	18.37
136	Southampton Road - North (SR-N)	16.38	11.64
147	Southampton Road - South (SR-S)	15.57	11.06
148	Column 146 Southampton Road (SR-Col146)	22.37	15.89
149	Column 147 Southampton Road (SR-Col147)	14.43	10.25
150	Column 154 Southampton Road (SR-Col154)	17.52	12.45
151	Column 155 Southampton Road (SR-Col155)	18.07	12.84
152	Column 171 Southampton Road (SR-Col171)	21.56	15.32
153	Column 172 Southampton Road (SR-Col172)	15.75	11.19
154	Column 177 Southampton Road (SR-Col177)	19.55	13.89

The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated that a verification factor of 1.4174 was required to be applied to all NO_x modelling results, as shown in Graph 1.

Graph 1 NO_x Verification Factor



Monitoring of PM_{10} and $PM_{2.5}$ concentrations is not undertaken at roadside locations within the assessment extents. The NO_x verification factor was therefore used to adjust model predictions of these species in lieu of more accurate data in accordance with DEFRA guidance[28].

[28] Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.