1ST HORIZON

AIR QUALITY ASSESSMENT (REF: 8607-R03) REV E

Client: **Home Office**

Project: **Haslar IRC, Gosport**

Date: **05/05/2026**

CONTENTS

1.0 NON-TECHNICAL SUMMARY

1.1 This report details an Air Quality Assessment to determine potential air quality impacts for a planning application for the expansion of Haslar IRC, Dolphin Way, Haslar, Hampshire PO12 2AW (approximate National Grid Reference (NGR) 461510, 98300), located within the Gosport Borough Council planning authority.

1.2 The development has potential to cause impacts at nearby sensitive locations during operational and construction phases. Existing local emission sources also have potential to expose future site occupiers to an area of poor air quality.

1.3 An Air Quality Assessment has been undertaken to assess the significance of potential impacts and to determine site suitability.

1.4 Construction phase impacts were assessed in accordance with standard industry guidance methodology to determine risk and identify necessary dust control measures. Assuming the implementation of the recommended good practice dust control measures during construction, residual impacts relating to fugitive dust emissions were predicted to be negligible.

1.5 On site exposure to pollutants was assessed by reviewing local monitoring data, emission sources, and background concentration resources.

1.6 The site is not located close to major roads, nor is it situated within or adjacent to an area identified by the local authority as experiencing elevated pollutant concentrations. Available monitoring and background data in the vicinity of the site were reviewed and indicate that pollutant concentrations across the site are predicted to be acceptable and will comply with all relevant objectives and exposure periods.

1.7 A dispersion modelling assessment was undertaken to quantify air quality impacts at off-site sensitive locations. Results were verified using local monitoring results. Impacts of road pollutant emissions during site operation were predicted to be negligible at all sensitive receptor locations within the vicinity of the site. The overall significance of potential impacts was determined to be not significant.

1.8 Any redevelopment on the site would meet with national and local planning policies relating to air quality.

1.9 All air quality impacts from the proposed development are not significant and should not provide a constraint to planning permission.

2.0 INTRODUCTION

2.1 Background

2.1.1 1st Horizon were commissioned to undertake an Air Quality Assessment in support of a planning application for the expansion of Haslar IRC at land off Dolphin Way, Haslar, Hampshire PO12 2AW.

2.1.2 The application comprises the erection of new buildings for accommodation and dining facilities, refurbishment/replacement of [redacted] perimeter fences, erection of internal zonal fencing, vehicular and pedestrian gates, new site entrance gates and barrier, creation of internal road, car parking (new car parking and resurfacing of existing car park area) and hard surfacing. This is alongside the installation of lighting columns [redacted], installation of roof top solar PV panels, creation of recreational space for residents, landscaping and improvement of the footpath through the existing car park land.

2.1.3 The development has the potential to result in impacts at nearby sensitive receptors during the construction and operational phase. Impacts could arise due to fugitive dust emissions as a result of construction activities and road traffic emissions generated during the operational phase. Existing local emission sources also have potential to expose future site occupiers to an area of poor air quality.

2.2 Site Location and Context

2.2.1 The proposed redevelopment site is location at Haslar IRC, Dolphin Way, Haslar, Hampshire at the approximate National Grid Reference (NGR) 461510, 98300 and lies within the administration of Gosport Borough Council planning authority (GBC).

2.2.2 The site lies outside a well-established residential and commercial area and is flanked by Fort Road to the north and Dolphin Way to the east. No major roads are located close to the proposed development, with the A32 (Mumby Road) located 1.5 km to the north.

2.2.3 Existing residential use is located to the north and east of the site along Fort Road and the recently developed Royal Hospital Haslar. Commercial premises are located to the west including Ministry of Defence (MoD) Fort Monckton and Gosport & Stokes Bay Golf Club to the west, with Haslar marina located east of the site beyond the Royal Hospital Haslar.

2.2.4 There are no Air Quality Management Areas (AQMAs) close to the site. Ecological designations were identified close to the site including the Portsmouth Harbour, Solent and Isle of Wight Lagoons, and Gilkicker Lagoon.

2.2.5 Reference should be made to **Figure 1** within **Appendix A** for a location plan and the surrounding context.

2.3 Limitations

2.3.1 This report has been produced in accordance with 1st Horizon's standard terms of engagement. 1st Horizon has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from 1st Horizon; a charge may be levied against such approval.

3.0 LEGISLATION GUIDANCE AND POLICY

3.1 Introduction

3.1.1 The following legislation, guidance and policy were considered during the preparation of the Air Quality Assessment:

- European Union (EU) Directive 2008/50/EC.
- The National Planning Policy Framework (NPPF).
- The National Planning Practice Guidance (NPPG), relevant chapters produced on 1st November 2019.
- Section 82 of the Environment Act (1995) (Part IV).
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Department for Environment, Food and Rural Affairs (DEFRA), 2023[1].
- The Air Quality Standards (Amendment) Regulations (2016).
- Local Air Quality Management Technical Guidance (TG22) 2022[2].
- Land-Use Planning and Development Control: Planning for Air Quality Guidance, Environmental Protection UK and IAQM, January 2017[3].
- Guidance on the Assessment of Dust from Demolition and Construction, IAQM, January 2024[4].

3.2 UK Legislation

3.2.1 The Air Quality Standards (Amendment) Regulations (2016) came into force on 31st December 2016. These Regulations amend the Air Quality Standards Regulations 2010 and transpose the EU Directive 2008/50/EC into UK law. Air Quality Limit Values (AQLVs) were published in these regulations for seven pollutants, as well as Target Values for an additional six pollutants.

3.2.2 Part IV of the Environment Act (1995) requires the 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) in 20231. The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations not to be exceeded either without exception or with a permitted number of exceedances over a specified

[1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2023
[2] Local Air Quality Management Technical Guidance 2022 LAQM.TG22, DEFRA, August 2022.
[3] Land-Use Planning and Development Control: Planning for Air Quality, EPUK and IAQM, January 2017
[4] Guidance on the Assessment of Dust from Demolition and Cons uction, IAQM, January 2024

timescale. These are generally in line with the AQLVs, although the requirements for compliance vary slightly.

3.2.3 **Table 1** presents the AQOs for pollutants considered within this assessment.

Table 1 - Air Quality Limit Values and Objectives

Pollutant	Air Quality Objectives	
	Concentration (µg/m³)	Averaging Periods
Nitrogen dioxide (NO_2)	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
Particulate matter with an aerodynamic diameter of less than 10µm (PM_{10})	40	Annual mean
	50	24-hour mean; not to be exceeded more than 35 times a year
Particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$)	20	Annual mean

3.2.4 **Table 2** summarises the advice provided in the DEFRA guidance LAQM (TG22)[5] on where the AQOs for pollutants considered within this report apply.

[5] Local Air Quality Management Technical Guidance LAQM (TG22), DEFRA, 2022

Table 2 - Examples of Where the Air Quality Objectives Apply

Averaging 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, colleges, hospitals, care homes, and the like.	Building facades 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 and 8 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 and the like which are not fully enclosed and 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.

3.3 Local Air Quality Management

3.3.1 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 administration under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves considering present and likely future air quality against the AQOs. If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an 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.

3.4 Local Air Quality Policy

3.4.1 The Gosport Local Plan 2011 - 2029[6] was adopted in October 2015 and sets the strategic planning context for the future until 2029. A review of the Gosport Local Plan indicated that the following policies in relation to air quality that are relevant to this assessment:

Policy LP46 – Pollution Control

"Planning permission will not be granted for development proposals where it is likely to cause significant adverse environmental impacts through air, noise and light pollution as set out below.

Air Pollution

1. *Development proposals will not be permitted when they are likely to:*

a) *lead to current national standards or objectives being exceeded individually or in combination with other land uses; or*

b) *be adversely affected by existing poor air quality."*

Policy LP10 – Design

2. *"Proposals will be permitted within the urban area as defined on the Policies Map, provided that:*

Safe and high quality neighbourhoods

a) *it does not cause harm by reason of:*

   ii. *noise, light pollution, vibration, smell, or air pollution; or*
   iii. *other adverse impacts;"*

3.4.2 Additionally, the Draft Gosport Local Plan 2038[7] was submitted to the Secretary of State for examination in public in September 2021 and sets out detailed policies which will be used to determine planning applications for development within the borough until 2038. A review of the Local Plan indicated the following policies relevant to air quality.

Policy D8- Healthy Communities

1. *"The Borough Council and its partners will work together to facilitate and promote healthy living to improve the wellbeing of local residents.*

2. *Planning permission will be granted for proposals which contribute to and promote a healthy lifestyle including: When considering development proposals, the Council will adopt the approach set out below to ensure that pollution will not have an unacceptable*

[6] Gosport Borough Local Plan 2011-2029, Gosport Borough Council, October 2015
[7] Gosport Borough Local Plan 2038, Gosport Borough Council, September 2021

impact on human health, general amenity, critical environmental assets, or the wider natural environment.

3. *Planning permission will not be granted for proposals which contribute to poor health in accordance with other relevant policies in the Local Plan including issues relating to: Air Quality"*

Policy LE9 - Pollution Control

1. *" Planning permission will be granted for proposals where the projected levels of pollution generated by the development, including air, odour, noise and light pollution, do not have a likely significant effect upon existing and future occupiers, neighbouring occupiers, and the wider environment.*

2. *Where pollution is a material consideration proposals should submit an appropriate impact assessment. Where impacts are likely to occur during the construction phase a Construction and Environmental Management Plan should be submitted.*

3. *Development proposals which include provisions to reduce or mitigate existing pollution will be supported.*

<u>Air Pollution</u>

4. Development proposals will not be permitted when they are likely to:

a) Lead to current national or local standards or objectives being exceeded individually or in-combination with other land uses; or
b) Be adversely affected by existing poor air quality."

3.4.3 These policies have been considered while undertaking the baseline assessment. This was done by reviewing existing pollution levels in the surrounding area and determining the likely significance of development impacts.

4.0 METHODOLOGY

4.1 Scope

4.1.1 Emissions generated by the proposed development when operational will have the potential to cause impacts at existing sensitive locations. These have been assessed in accordance with the following assessment methodology which consists of:

- Baseline Assessment
- Construction Phase Dust Risk Assessment
- Operational Phase Impact Assessment

4.2 Baseline Assessment

4.2.1 Baseline conditions within the assessment extents were determined by a review of the latest Gosport Borough Council (GBC) Annual Status Report[8] and predicted background pollutant concentrations produced by DEFRA[9]. Local emission sources along with the nearby AQMAs were considered to identify conditions in the local area.

4.3 Construction Phase Assessment

4.3.1 There is potential for fugitive dust impacts to occur at sensitive locations as a result of demolition, earthworks, construction and trackout activities during the construction phase of the proposed development. A risk assessment has been undertaken in accordance with the methodology outlined within the IAQM guidance[4].

4.3.2 The assessment has identified site-specific control measures to be implemented on site which aim to reduce residual fugitive dust impacts.

4.3.3 The site specific assessment is presented in **Section 6.1**.

4.4 IRC Operational Impacts

4.4.1 Once the IRC is operational, additional traffic will be generated on the local road network which may cause an increase in pollutant concentrations at sensitive receptors adjacent to affected roads.

4.4.2 Potential road vehicle exhaust impacts with vehicles travelling to and from the site were initially screened against the criteria contained within the EPUK and IAQM guidance[3] to determine the likely significance of impacts and where detailed assessment work is

[8] Fareham and Gosport Borough Councils Annual Status Report 2025, Fareham and Gosport Council, June 2025
[9] https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021

necessary. The EPUK and IAQM guidance document states the following assessment thresholds for impacts once the IRC is operational:

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

4.4.3 Based on the information provided by the appointed transport consultant, traffic flows generated by the proposed development are anticipated to exceed the relevant EPUK and IAQM assessment criteria on road links within the study area. NO_2 and PM concentrations were therefore predicted at sensitive discrete receptors, with and without the development in place, in the locations where development traffic is predicted to exceed the EPUK and IAQM thresholds. The following scenarios were assessed:

- 2024 as baseline year for verification against latest ratified monitoring data.
- Opening year do-minimum (DM) - Predicted traffic flows for 2030 without the proposed development, plus local committed developments.
- Opening year do-something (DS) - Predicted traffic flows for 2030 with the addition of traffic flows generated by the proposed development.

4.4.4 Baseline and future year traffic flows were provided and include both light duty vehicles (LDV) and HDV flows.

4.5 EPUK and IAQM Impact Significance Criteria

4.5.1 Receptors potentially sensitive to changes in pollutant concentrations will be identified within the assessment extents and defined using the guidance provided in LAQM.TG22[2]. The impact at each receptor will be defined in accordance with EPUK and IAQM guidance[3] criteria shown in **Table 3.**

Table 3 - EPUK and IAQM Assessment Impact Criteria

Long Term Average Concentration	% Change in Concentration Relative to 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

4.5.2 The criteria shown in **Table 3** is extracted from the EPUK and IAQM[3] guidance and provides descriptors to allow comparisons of various air quality impacts. Changes of 0%, such as those less than 0.5%, will be described as negligible in accordance with the EPUK and IAQM[3] guidance.

4.5.3 Following the prediction of impacts at discrete receptor locations utilising the criteria in **Table 3** the EPUK and IAQM guidance[4] states that this framework is to be used as a starting point to make a judgement on the significance of the effect. The guidance suggests that any judgement on the overall significance of effects of a development will need to consider factors such as:

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

4.5.4 These factors were considered, and an overall significance was determined for the impact of road traffic emissions once the IRC is operational. 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.

4.5.5 Full details of inputs utilised in the modelling assessment exercise and subsequent results are presented in **Appendix B** and **Appendix C**.

5.0 BASELINE CONDITIONS

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

5.1 Emission Sources

5.1.1 There are no major industries in the assessment extents that are significant contributors to air pollution, with the main sources of air pollution being road traffic with contributions from shipping.

5.1.2 The proposed development is located approximately 1.5km south of the A32 (Mumby Road) which is the closest major road to the site. As such emissions from the local road network are unlikely to cause adverse impacts across the site.

5.1.3 Pollutants of concern in the UK from road traffic sources are Nitrogen Dioxide ($NO_{2)}$ and fine Particulate Matter (PM). There are no other significant emission sources in the study area which are of concern and therefore this assessment has focused on these pollutants alone. In the UK and particularly outside of London, it is normally only locations directly adjacent to major roads that can experience potentially significant air quality concentrations

5.2 Air Quality Management Areas

5.2.1 As required by the Environment Act (1995) GBC have undertaken a review and assessment of air quality within their area of administration. This process has indicated that all pollutants considered within the AQS are currently below the relevant AQOs across the borough and, as such, no AQMAs have been designated.

5.2.2 To the north of Gosport in Fareham Borough Council (FBC), two AQMAs at the Quay Street Roundabout and adjacent to the A32 have recently been revoked and therefore have not been considered further in the assessment.

5.3 Local Air Quality Monitoring

5.3.1 Annual Mean and Short-Term Concentrations

5.3.1.1 GBC and FBC's latest joint Annual Status Reports (ASR) was reviewed to identify representative monitoring locations close to the proposed development which could assist in the determination of on-site baseline conditions.

5.3.1.2 The review indicated the closest automatic station as Tichborne Way (GOS1) located 5km northeast of the proposed development at NGR: 508708, 221352. The analyser is located within 3m of the A32 and provides an overly robust comparison when compared to the likely conditions of the proposed development. Recent data is presented in **Table 44.**

Table 4 - Automatic Analyser Monitoring Results

Site Name	Type	Distance to Site (m)	Pollutant Species and Averaging Period	Annual Mean NO_2 Concentration (µg/m³)			
				2021	2022	2023	2024
GOS1 - Tichborne Way	Roadside	5,113	Annual Mean NO_2	18.5	19.1	17.7	18.7
			1-hour Mean NO_2*	0	0	0	0

** Number of 1-hour periods where daily mean concentrations greater than 200 µg/m³*

5.3.1.3 Data from the Tichborne Way analyser indicates no exceedances of the annual or 1-hour mean objectives in recent years.

5.3.1.4 On-site annual mean NO_2 concentrations are likely to be less than the maximum roadside monitored concentration of 19.1 µg/m³.

5.3.1.5 The 1-hour mean AQO for NO_2 allows for 18 exceedances of the objective in a year. **Table 4** indicates that the AQO was not exceeded for any 1-hour period in recent years. Therefore, 1-hour mean NO_2 concentrations are considered well below the AQO.

5.3.1.6 The above sections also considered annual mean monitored concentrations and background levels and indicated that on-site annual mean NO_2 concentrations are likely to be less than the maximum roadside monitored concentration of 19.1 µg/m³.

5.3.1.7 DEFRA has produced technical guidance LAQM (TG22)[2] to assist local authorities with their review and assessment of air quality. As stated in LAQM (TG22) if annual mean NO_2 concentrations are below 60 µg/m³ then it is unlikely that the 1-hour AQO will be exceeded. As such based on the above it is a further indication that concentrations will not exceed the 1-hour mean AQO for NO_2 across the site in current or future years.

5.3.1.8 A review of the GBC passive diffusion tube network indicated two monitoring locations within 2 km of the site, adjacent to the B3333 northwest of the site. Data from these locations is presented in **Table 5.**

Table 5 - NO_2 Diffusion Tube Monitoring Results

ID	Site Name	Type	Distance to Road (m)	Distance to Site (m)	Annual Mean Concentration (µg/m³)			
					2021	2022	2023	2024
T	Bury Cross 2	Roadside	2 (B3333)	1,956	27.5	22.9	23.9	24.3
S	Bury Cross 1	Roadside	1 (B3333)	1,976	26.3	23.8	24.8	23.7

5.3.1.9 NO_2 diffusion tube monitoring data in recent years indicates no exceedances of the annual mean AQO.

5.3.2 PM Concentrations

5.3.2.1 The Tichborne Way analyser also provides PM_{10} monitoring. Results from this are shown in **Table 6.**

Table 6 - Automatic PM Monitoring Results

Site Name	Pollutant Species	Annual Mean PM Concentration (µg/m³)			
		2021	2022	2023	2024
GOS1 - Tichborne Way	Annual Mean PM_{10}	18.5	16.5	16.8	17.9
	24-hour Mean PM_{10}*	2	1	0	0

** Number of 24-hour periods where daily mean concentrations greater than 50 µg/m³*

5.3.2.2 Data from the Tichborne Way analyser indicates no exceedances of the annual or 24-hour mean objectives in recent years.

5.3.2.3 The 24-Hour mean AQO for PM_{10} allows for 35 exceedances of the objective in a year. **Table 6** indicates that the AQO was only exceeded for a maximum of two 24-hour periods at the background location. Therefore, 24-hour mean PM_{10} concentrations are predicted to be well below the AQO at the site.

5.3.3 DEFRA Background Concentrations

5.3.3.1 Predictions of background pollutant concentrations have been produced by DEFRA[10] for the entire of the UK to assist LAs in their review and assessment of air quality. The site is in grid square NGR: 461500, 98500 and data for this location was downloaded from the DEFRA website for the purpose of this assessment.

5.3.3.2 Background data from 2024 was used to represent current conditions and 2030 was chosen to represent a worst case (earliest) future year and is summarised in **Table 7**. Background concentrations include estimates of pollutant contributions from road and industrial sources in the area.

Table 7 - DEFRA Background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m³)	
	2024	2030
NO_2	10.86	8.76
PM_{10}	10.17	9.55
$PM_{2.5}$	6.55	6.00

5.3.3.3 DEFRA background predictions of concentrations of NO_2 and PM do not exceed the relevant AQOs during the baseline or predicted opening year. The data also indicates

[10] https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021

that concentrations are predicted to decrease in future years and suggests an improvement to local air quality.

5.3.3.4 LAQM (TG22)[2] also provides guidance on estimating the number of days that the 24-hour mean AQO would be exceeded based on annual mean concentrations and using the formula below:

No. of 24-hour mean exceedances = -18.5 + 0.00145 × annual mean^3 + (206/annual mean)

5.3.3.5 The AQO allows for 35 days of exceedances. Using a maximum Defra background annual mean of 10.17 µg/m^3, it is predicted that the 24-hour mean would be exceeded for less than 4 days per year.

5.4 Operational Phase Sensitive Receptors

5.4.1 A desk-top study was undertaken to identify worst case sensitive receptor locations adjacent to the affected road network. Locations have been selected based on the distribution of traffic generated by the proposed development. Based on traffic distribution data and IAQM screening thresholds, the following road links are potentially adversely affected by the proposed development:

- Fort Road.
- Anglesey Road.
- Foster Road.
- Bury Road.

5.4.2 Most receptor locations represent residential premises where members of the public might reasonably be expected to spend one hour or more. The identified receptor locations are summarised in **Table 78**.

Table 8 - Modelled Sensitive Receptors

Receptor Name		Land Use	NGR (m)		Height (m)
			X	Y	
HR1	2C Fort Road	Residential	461429	98417	1.5
HR2	142 Clayhall Road	Residential	461378	98516	1.5
HR3	38 Fort Road	Residential	461291	98209	1.5
HR4	69 Crescent Road	Residential	460148	98443	1.5
HR5	Stephenson Close	Residential	460172	98599	1.5
HR6	Beechcroft Green Nursing Home	Residential	460522	99321	1.5
HR7	38 Foster Road	Residential	460550	99431	1.5

HR8	11A Foster Road	Residential	460452	99432	1.5
HR9	69 Bury Road	Residential	460302	99519	1.5
HR10	Gosport War Memorial Hospital	Healthcare	460067	99629	1.5

5.4.3 Receptors are modelled at 1.5 m to represent the average UK "breathing height" above ground level. Receptors modelled at heights above this level represent upper floors. **Figure 3** within **Appendix A** presents the modelled operational phase human receptor locations.

6.0 ASSESSMENT

6.1 Construction Phase Assessment

6.1.1 A desk top screening assessment (Step 1) identified sensitive receptors within 250 m of the site boundary, and within 50m of the anticipated trackout. These are summarised in **Table 9.**

6.1.2 One ecological designation was identified within 50m of the site boundary, the Solent and Dorset Coast Special Protection Area (SPA). Therefore, construction impacts on this ecological receptors have been considered further within the assessment.

Table 9 - Sensitive Receptor Counts

Distance from Site or Trackout Routes (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Earthworks and Construction		
Less than 20	10 – 100	1
20 – 50	10 – 100	1
50 – 100	More than 100	1
100 – 250	More than 100	1
Trackout		
Less than 20	10 – 100	0
20 – 50	More than 100	0

6.1.3 **Figure 4** and **Figure 5** within **Appendix A** provide maps of the demolition, construction and trackout buffer distances.

6.1.4 Due to sensitive receptors being within the defined assessment distance bands an assessment of potential dust impacts was required. This is detailed in the following sections as informed by the IAQM guidance, which is provided in **Appendix D**.

6.2 Magnitude

6.2.1 The scale and nature of the works was determined to assess the magnitude (Step 2A) of fugitive dust emissions arising from each construction phase activity. The determination of magnitude was based upon the criteria detailed in **Appendix D.**

6.2.1 Demolition

6.2.1.1 The site is currently occupied by existing buildings which may require minor demolition works. Based on this, the magnitude of potential dust emissions related to demolition activities was considered small (demolition volume less than 20,000 m^3).

6.2.2 Earthworks

6.2.2.1 The proposed development site may require significant imports or exports of material to prepare for construction. Based on the estimated site area of 73,000m^2 the magnitude of potential dust emissions related to earthwork activities is considered medium (site area between 18,000m^2 and 110,000m^2).

6.2.3 Construction

6.2.3.1 The proposed development comprises the new buildings up to 12m and the renovation of existing buildings. Based on proposed elevations and the IAQM criteria the magnitude of potential dust emissions related to construction activities is considered large (construction volume > 75,000m^3).

6.2.4 Trackout

6.2.3.2 Based on the site area, it is anticipated that the unpaved road length the magnitude of potential dust emissions related to trackout activities is considered large (i.e. unpaved road length >100m).

6.2.3.3 A summary of the construction phase magnitudes is detailed in **Table 10.**

Table 10 - Dust Emission Magnitude

Demolition	Earthworks	Construction	Trackout
Small	Medium	Large	Large

6.3 Area Sensitivity

6.3.1 The next step (Step 2B) was to determine the sensitivity of the surrounding area, based on the number, proximity, and type of receptors. To ensure a worse case assessment all receptors were assumed to be highly sensitive (e.g. residential). The sensitivity of the area for both dust soiling and human health is summarised below.

6.2.5 Dust Soiling

6.2.5.1 Residential dwellings are located directly adjacent to the northern site boundary. Based on the receptor counts provided in **Table 9**, the site is assessed as a high sensitivity to all construction phase activities.

6.2.6 Human Health

6.2.6.1 Predicted annual mean background concentrations of PM_{10} within the vicinity of the proposed site, as predicted by DEFRA, are 10.17 µg/m^3 (**Table 7**). Based on the receptor counts provided in **Table 9**, the area is assessed as a low sensitivity to all construction phase activities.

6.2.7 Ecological Receptors

6.2.7.1 Predicted annual mean background concentrations of PM_{10} within the vicinity of the proposed site, as predicted by DEFRA, are 10.17 µg/m3 (**Table 7**). Based on the receptor counts provided in **Table 9**, the area is assessed as a low sensitivity to all construction phase activities.

6.4 Impact Risk

6.4.1 The next stage of the assessment (Step 2C) combined the dust magnitude and area sensitivity defined above to determine the overall risk with no mitigation applied. This is summarised in **Table 11.**

Table 11 - Summary of Unmitigated Dust Risk

Impact	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	High	High
Human Health	Negligible	Low	Low	Low
Ecological	Low	Medium	Medium	Negligible

6.4.2 Following the determination of risk for each activity, the final step (Step 3) detailed necessary mitigation measures to reduce impacts during the construction phase.

6.4.3 These measures have been adapted for the proposed development and summarised in **Table 14** of **Section 7**. Assuming the relevant mitigation measures are implemented, the residual effect from all dust generating activities would be considered negligible.

6.5 Road Traffic Exhaust Impacts

6.4.4 A dispersion modelling assessment was undertaken to quantify potential changes in pollutant concentrations at sensitive locations across the affected road network. Predicted impact significance at individual receptors on annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations, based on the assessment criteria given in **Table 3**, are summarised in **Table 12.**

Table 12 - Summary of Operational Phase Impacts

Pollutant and Period	Receptors	Impact Descriptor
Annual Mean NO_2	All Receptors	Negligible
Annual Mean PM_{10}	All Receptors	Negligible
Annual Mean $PM_{2.5}$	All Receptors	Negligible

As shown in **Table 12,** the impacts were predicted to be negligible at all sensitive receptors.

The overall significance of potential impacts was determined to be not significant in accordance with the EPUK and IAQM guidance[3]. Full assessment results and commentary can be found in **Appendix C**, with justifications summarised in **Table 13.**

Table 13 - Overall Road Emissions Impact Significance

Guidance	Comment
Number of properties affected by slight, moderate, or substantial air quality impacts and a judgement on the overall balance	Impacts on NO_2, PM_{10} and $PM_{2.5}$ concentrations were predicted to be negligible at all sensitive receptors. These represent worst-case locations and therefore it is unlikely that any other receptors would be significantly affected by the proposed development.
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	The proposed development will not result in any new sensitive exposure to pollutant concentrations above the AQOs at sensitive locations
The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors	The maximum changes in annual mean for NO_2, PM_{10} and $PM_{2.5}$ concentrations relative to their respective AQOs were predicted to range from: ➢ 0.08% to 0.53% for NO_2, ➢ 0.05% to 0.32% for PM_{10}; and ➢ 0.05% to 0.35% for $PM_{2.5}$. Resultant impacts were therefore negligible at all receptor locations for each pollutant species
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 no predicted exceedances of the annual mean AQOs for NO_2, PM_{10} or $PM_{2.5}$ at any sensitive receptor location within 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 significance than an annual mean of 51 µg/m^3	As above, there were no predicted exceedances at any receptor locations within the modelling extents, and impacts should attract less significance.

6.1.1 Based on the above analysis, the overall road traffic emission impacts expected once Haslar IRC is operational were determined as not being significant.

7.0 MITIGATION

Table 14 - Fugitive Dust Mitigation Measures

Activity	Mitigation Measure		
Site Management	1	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	H
	2	Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust accountable for air quality pollutant emissions and dust issues on the site boundary.	H
	3	Display the head or regional office contact information.	H
	4	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority.	H
	5	Record and respond to all dust and air quality pollutant emissions complaints.	H
	6	Make a complaints log available to the local authority when asked.	H
	7	Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked.	H
	8	Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions.	H
	9	Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation is recorded in the log book.	H
Monitoring Preparing & Maintaining Site	10	Plan site layout: machinery and dust causing activities should be located away from receptors.	H
	11	Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site.	H
	12	Fully enclose the site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	H
	13	Avoid site runoff of water or mud.	H
	14	Keep site fencing, barriers and scaffolding clean using wet methods.	H
	15	Remove materials from site as soon as possible.	H
	16	Cover, seed or fence stockpiles to prevent wind whipping.	H

Activity	Mitigation Measure		
Operating Vehicle/Machinery & Sustainable Travel	17	Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone.	H
	18	Ensure all non-road mobile machinery (NRMM) comply with the standards set within this GLA guidance.	H
	19	Ensure all vehicles switch off engines when stationary – no idling vehicles.	H
	20	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where possible.	H
	21	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	H
Operations	22	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	H
	23	Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible).	H
	24	Use enclosed chutes, conveyors and covered skips.	H
	25	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H
	26	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.	H
Waste Management	27	Reuse and recycle waste to reduce dust from waste materials	H
	28	Avoid bonfires and burning of waste materials.	H
Demolition	29	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	D
	30	Ensure water suppression is used during demolition operations.	H
	31	Avoid explosive blasting, using appropriate manual or mechanical alternatives.	H
	32	Bag and remove any biological debris or damp down such material before demolition.	H
Construction	33	Avoid scabbling (roughening of concrete surfaces) if possible	H
	34	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	H
	35	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.	H
	36	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	D

Activity	Mitigation Measure		
Trackout	37	Regularly use a water-assisted dust sweeper on the access and local roads, as necessary, to remove any material tracked out of the site.	H
	38	Avoid dry sweeping of large areas.	H
	39	Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport.	H
	40	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	H
	41	Record all inspections of haul routes and any subsequent action in a site log book.	H
	42	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	H
	43	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	H
	44	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.	H
	45	Access gates to be located at least 10 m from receptors where possible.	H

**D – desired*
**H – highly recommended*

7.1 Subject to the identified mitigation measures outlined in **Table 14** being implemented, the residual effect from all dust generating activities is predicted to be negligible and therefore not significant in accordance with the IAQM guidance[4].

8.0 CONCLUSION

8.1 This report details a review of air quality at a proposed development site located at Haslar IRC, Gosport.

8.2 The initial assessment consisted of a review of planning policy, site location, emission sources, recent monitoring data in the area local authority air quality management and national background pollutant concentrations produced by DEFRA.

8.3 Potential impacts during the construction and operational phases of the development may occur due to future exposure to pollution on the site and from additional NO_2 and fine PM emissions associated with vehicles travelling to and from the site.

8.4 The site is not close to major roads or located within or adjacent to an area identified by the LA as experiencing elevated pollutant concentrations. Available monitoring and background data in the vicinity of the site was reviewed and indicated that pollutant concentrations across the site are predicted to be well below all relevant air quality objectives and determined as not significant.

8.5 A qualitative construction dust risk assessment was undertaken in accordance with the methodology to assess impacts and recommend a mitigation strategy. Assuming good practice and the implementation of suggested dust control measures, detailed in **Table 14**, residual impacts are predicted to be negligible.

8.6 A dispersion modelling assessment was undertaken to quantify air quality impacts at off-site sensitive locations due to additional road traffic generated by the proposed development. Results were verified using monitoring results obtained from GBC and FBC.

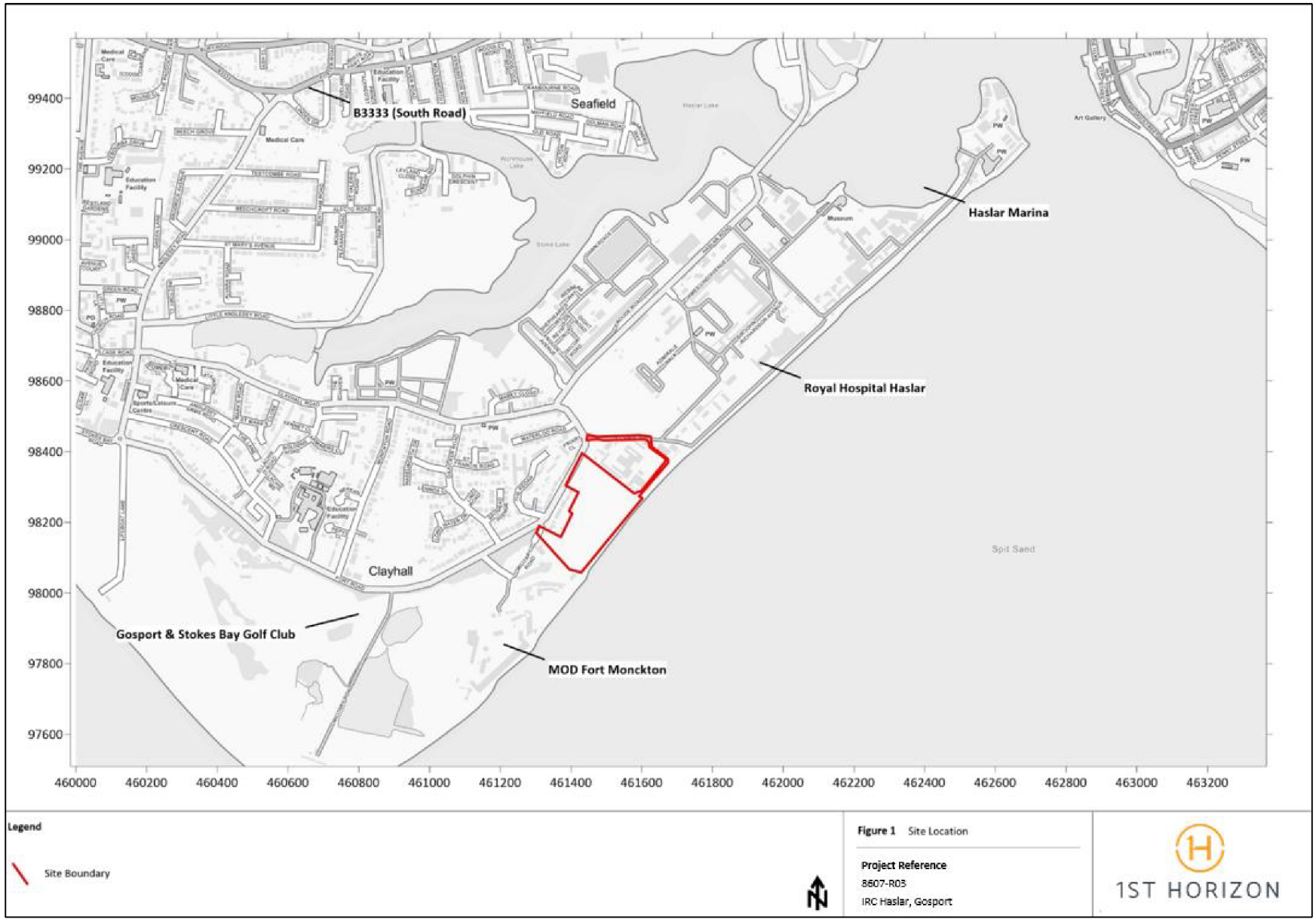
8.7 NO_2, PM_{10} and $PM_{2.5}$ impacts once Haslar IRC is operational were predicted to be negligible at all sensitive receptor locations within the vicinity of the site. The overall significance of potential impacts was determined to be not significant, in accordance with the EPUK and IAQM guidance.

8.8 It is considered that all air quality impacts from the proposed development are not significant and should not provide a constraint to planning permission.

9.0 ABBREVIATIONS

AQMA	Air Quality Management Area
AQO	Air Quality Objective
DEFRA	Department for Environment, Food and Rural Affairs
EPUK	Environmental Protection UK
FBC	Fareham Borough Council
GBC	Gosport Borough Council
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
NGR	National Grid Reference
NO_2	Nitrogen Dioxide
NO_x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PM_{10}	Particulate Matter with an aerodynamic diameter less than 10 μm
$PM_{2.5}$	Particulate Matter with an aerodynamic diameter less than 2.5 μm

APPENDIX A:
Figures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Haslar Marina
Royal Hospital Haslar
Clayhall
Gosport & Stokes Bay Golf Club
MOD Fort Monckton
Spit Sand
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Site Boundary
Figure 1 Site Location
Project Reference
8607-R03
IRC Haslar, Gosport
1ST HORIZON


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Site Boundary
Diffusion Tube
Figure 2 Diffusion Tube Locations
Project Reference
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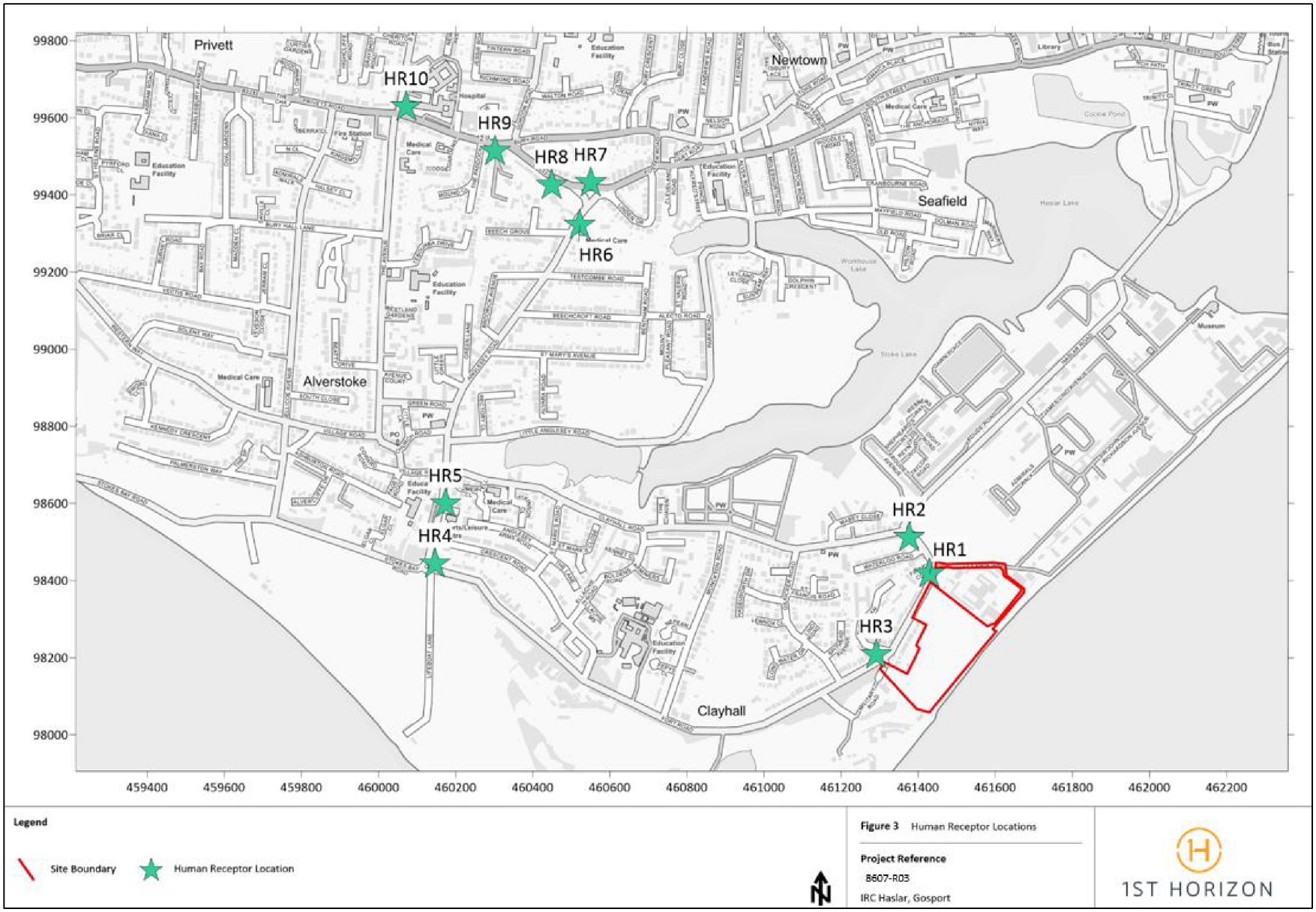
IRC Haslar, Gosport
1ST HORIZON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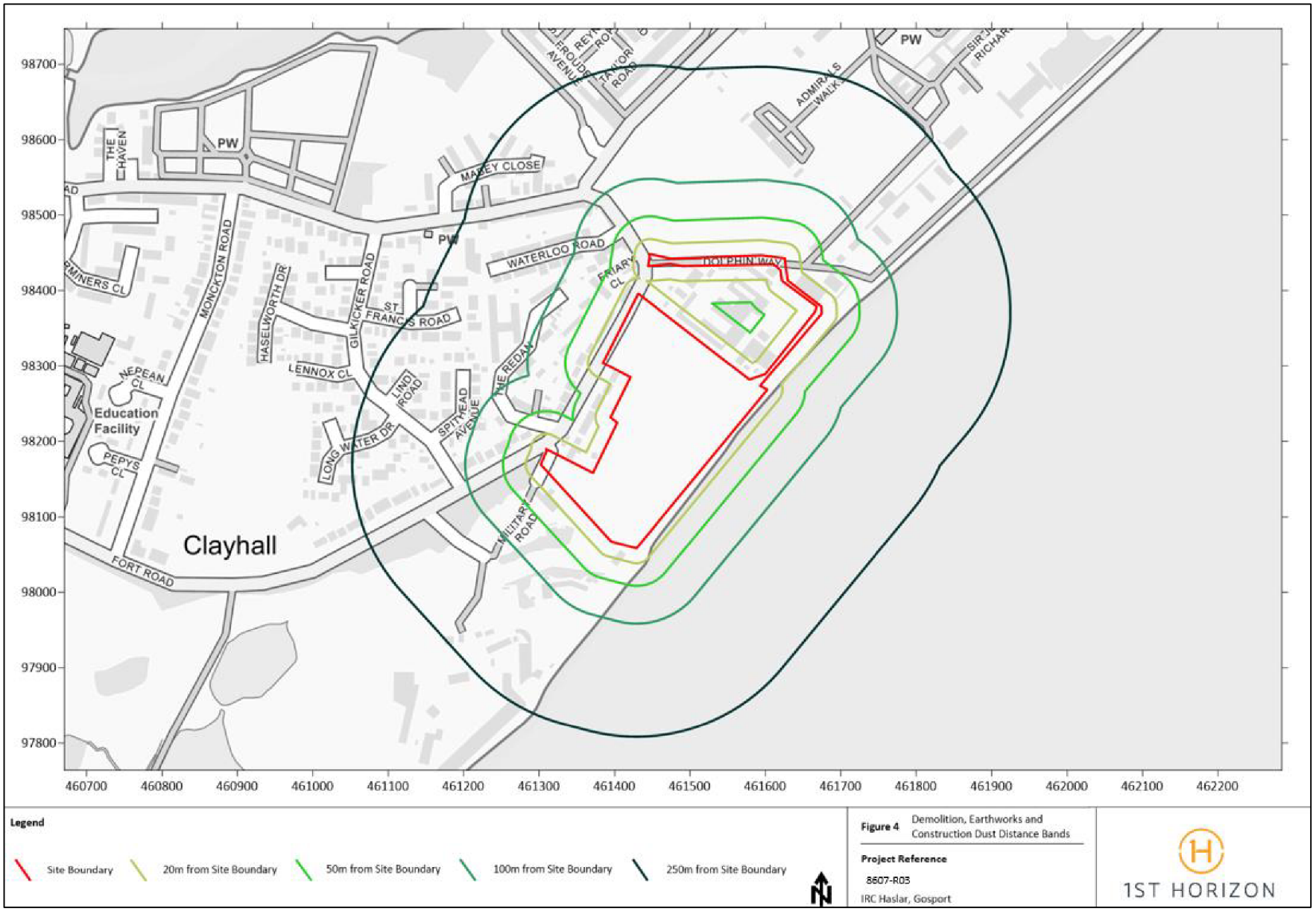
Site Boundary
Human Receptor Location
Figure 3 Human Receptor Locations
Project Reference
8607-R03
IRC Haslar, Gosport
1ST HORIZON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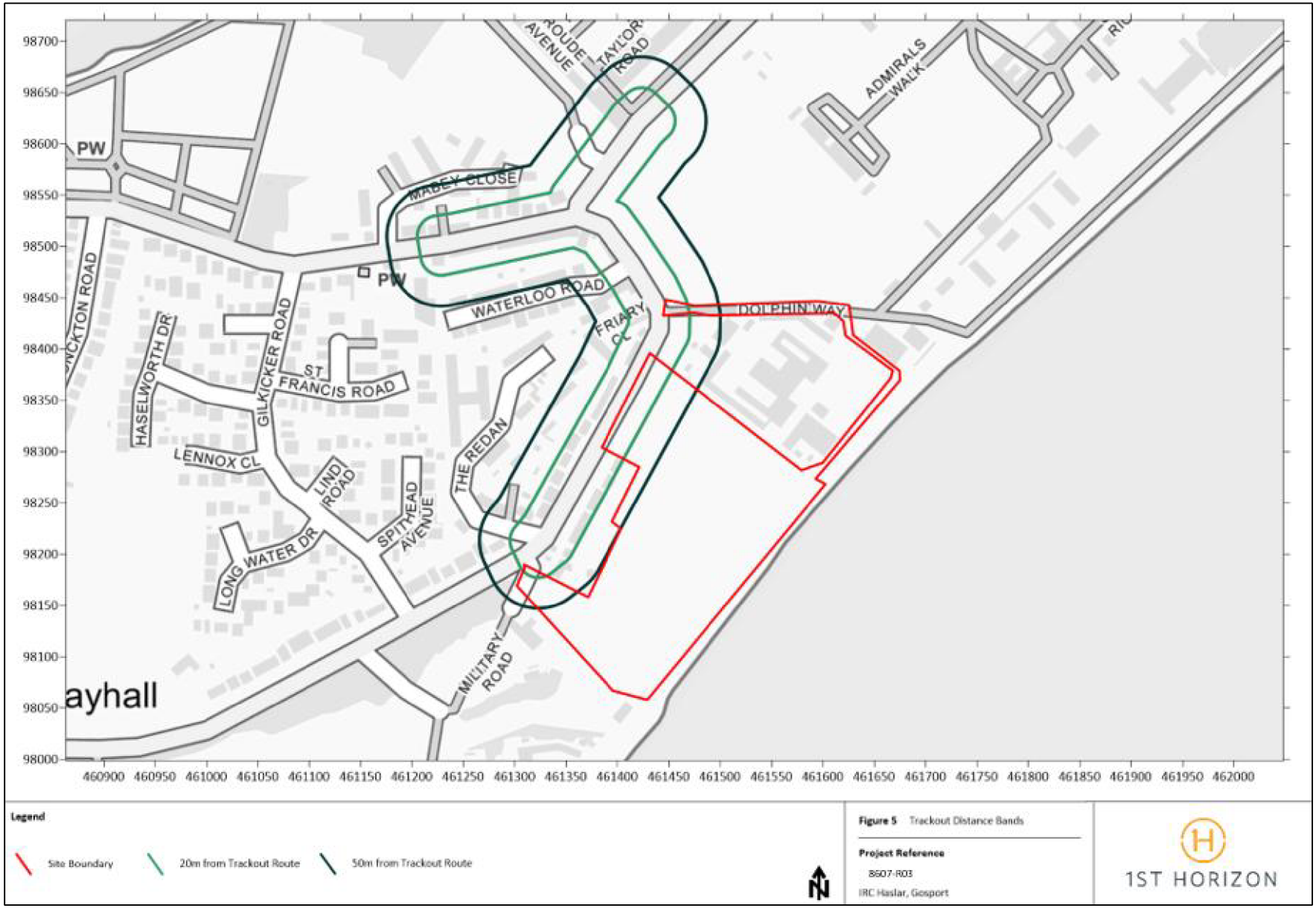
Clayhall
Education Facility
THE HAVEN
PW
MARLEY CLOSE
WATERLOO ROAD
DOLPHIN WAY
FRIARY CL
ADMIRALS WALK
MONCKTON ROAD
HASELWORTH DR
GILKICKER ROAD
ST FRANCIS ROAD
LENNOX CL
LIND ROAD
SPITHEAD AVENUE
THE REDAN
LONG WATER DR
NEPEAN CL
PEPYS CL
FORT ROAD
MILITARY ROAD
Legend
Site Boundary
20m from Site Boundary
50m from Site Boundary
100m from Site Boundary
250m from Site Boundary
Figure 4 Demolition, Earthworks and Construction Dust Distance Bands
Project Reference
8607-R03
IRC Haslar, Gosport
1ST HORIZON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TAYLOR ROAD
ADMIRALS WALK
WATERLOO ROAD
DOLPHIN WAY
FRIARY CL
ST FRANCIS ROAD
GILKICKER ROAD
HASELWORTH DR
LENNOX CL
LIND ROAD
SPITHEAD AVENUE
THE REDAN
LONG WATER DR
MILITARY ROAD
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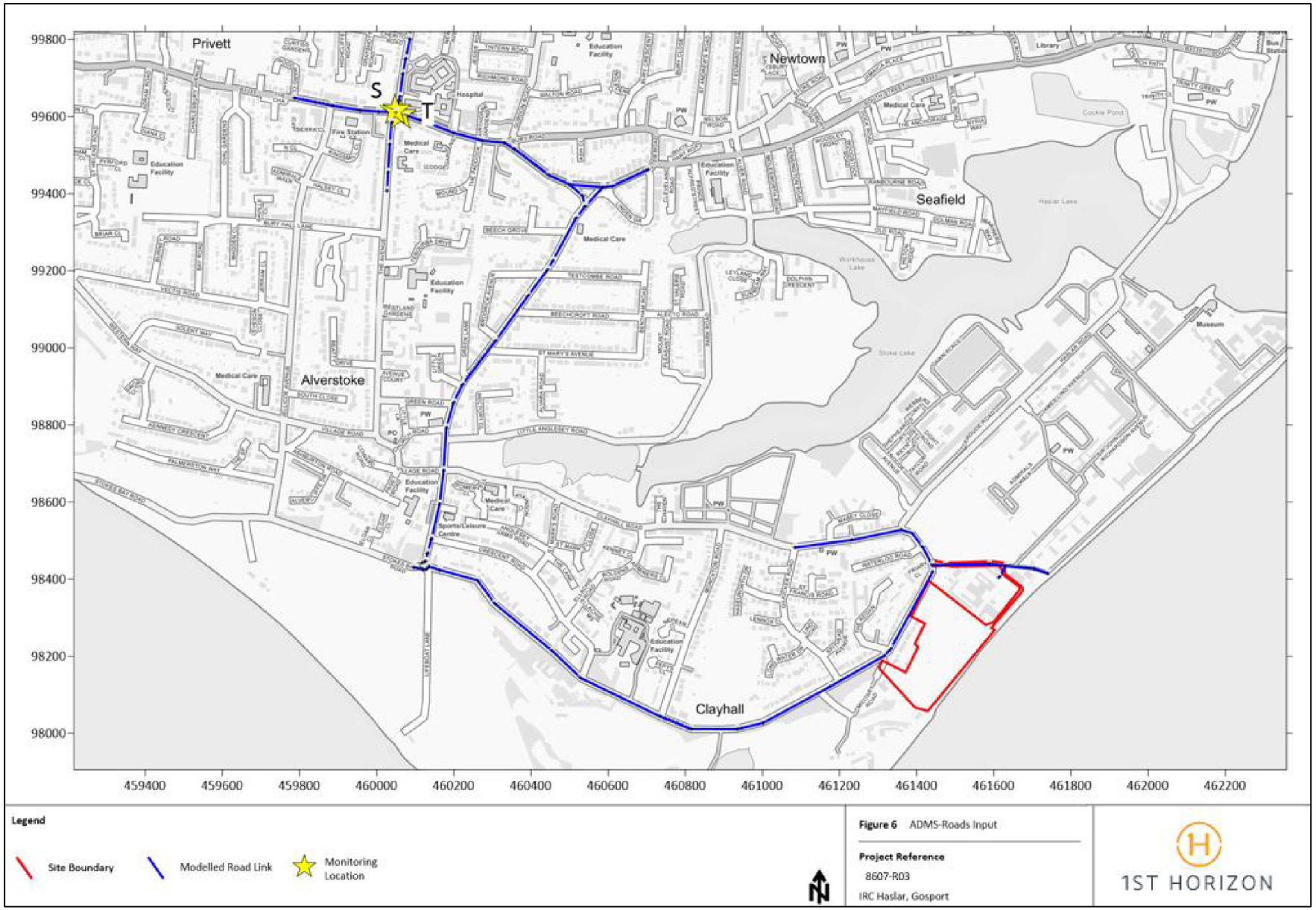
Legend
Site Boundary
20m from Trackout Route
50m from Trackout Route
Figure 5 Trackout Distance Bands
Project Reference
8607-R03
IRC Haslar, Gosport
1ST HORIZON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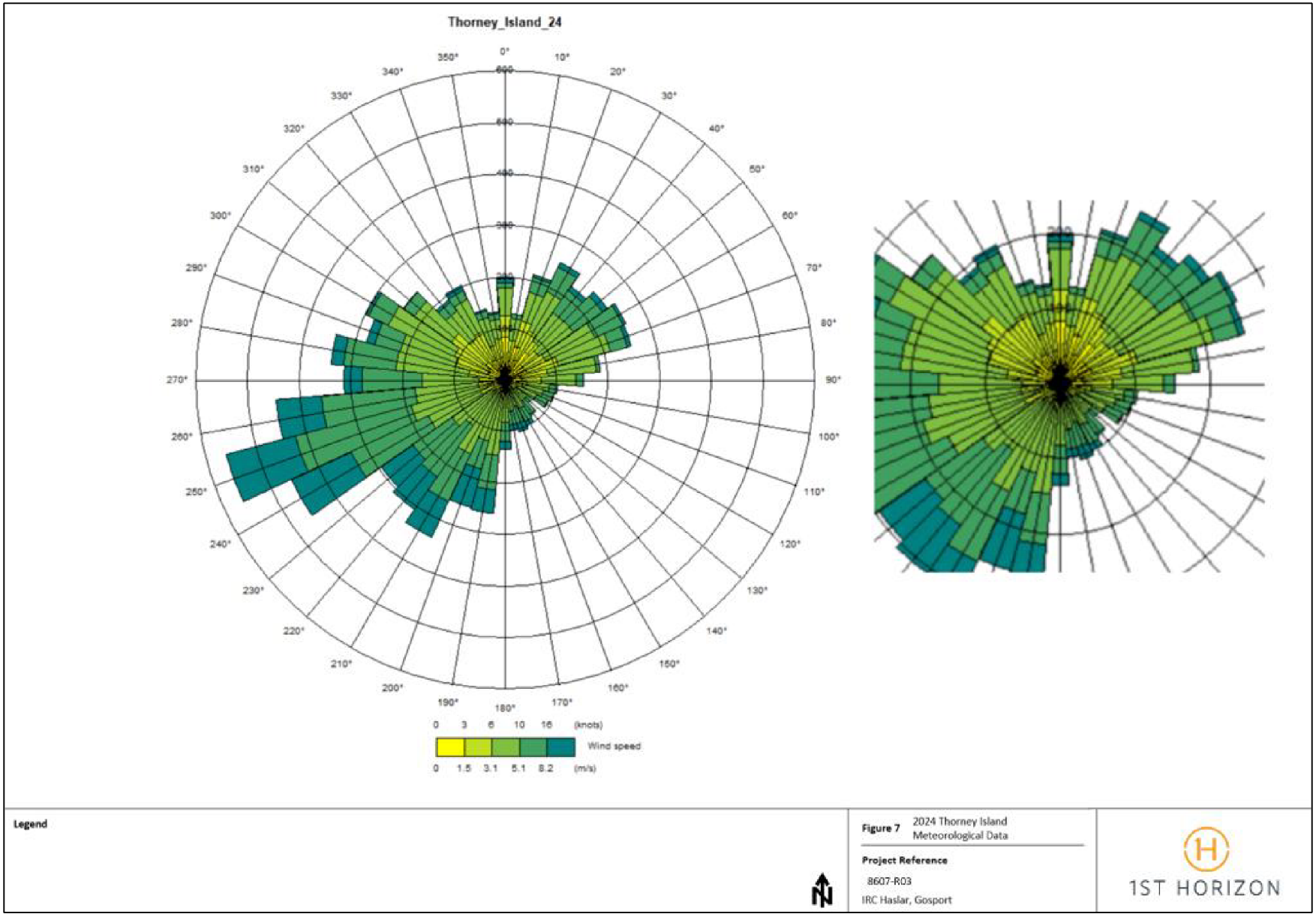
Site Boundary
Modelled Road Link
Monitoring Location
Figure 6 ADMS-Roads Input
Project Reference
8607-R03
IRC Haslar, Gosport
1ST HORIZON


Thorney_Island_24
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150°
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170°
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190°
200°
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280°
290°
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330°
340°
350°
0 3 6 10 16 (knots)
Wind speed
0 1.5 3.1 5.1 8.2 (m/s)
Legend
Figure 7 2024 Thorney Island Meteorological Data
Project Reference
8607-R03
IRC Haslar, Gosport
1ST HORIZON

APPENDIX B:
Model Inputs

Assessment Inputs

B1 Additional traffic generation from the site has the potential to cause impacts at nearby sensitive receptors located close to the affected road network.

B2 The assessment was undertaken in accordance with the guidance contained within the DEFRA document LAQM (TG22)[5].

Dispersion Model

B3 Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 5.1.0.2). 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.

B4 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; and
- Monin-Obukhov length.

Assessment Area

B5 Sensitive receptors were modelled along the predicted impacted road network where additional generated traffic flow is expected. These receptors are outlined in **Table 8** and **Figure 3.**

Traffic Flow Data

B6 Baseline and traffic flows were taken from the Department for Transport (DfT)[11] and Hampshire County Council[12] websites. Additional development traffic flows were provided by the appointed Transport Consultant, Hydrock.

B7 Growth factors provided by the Trip End Model Presentation Program (TEMPRO) software package were utilised to allow for conversion from the obtained traffic flows to 2024 and 2030, which were then used to represent the baseline and future year scenario.

[11]https://roadtraffic.dft.gov.uk/count-points
[12] https://hants-traffic.drakewell.com/publicmultinodemap.asp

B8 Vehicle speeds were estimated based on the free flow potential of each link and local speed limits. Road widths were estimated from aerial photography and UK highway design standards. Vehicle speeds were also provided or estimated based on the free flow potential of each link and local speed limits. Road widths were estimated from aerial photography and UK highway design standards.

B9 A summary of the traffic data and road geometries used in the verification scenario is provided in **Table AB1**.

Table AB1 - 2024 Verification Traffic Data

Road Link		Road Width (m)	Mean Vehicle Speed (km/hr)	24 Hour AADT Flow	HDV (%)
L1	Site Access	5	10	0	0.0
L2	Dolphin Way South	4.5	20	0	0.0
L3	Dolphin Way North	5	20	0	0.0
L4	Dolphin Way Slowdown	12.3	15	0	0.0
L5	Clayhall Road	5.5	35	2,125	2.0
L6	Fort Road	7	45	2,125	2.0
L7	Fort Road Roundabout Slowdown	6.6	15	2,125	2.0
L8	Fort Road/ Anglesey Road Roundabout	7.1	20	6,233	1.1
L9	Anglesey Road Roundabout Slowdown	9.3	15	8,286	1.0
L10	Stokes Bay Road Roundabout Slowdown	9	15	8,286	1.0
L11	Anglesey Road	6.5	40	8,286	1.0
L12	Anglesey Road/ Foster Road Slowdown (Northbound)	4.5	20	4,143	1.0
L13	Anglesey Road/ Foster Road Slowdown (Southbound)	6.4	32	4,143	1.0
L14	Foster Road East of Anglesey Road	4	40	11,088	1.1
L15	Foster Road between Slip roads	4	40	11,088	1.1
L16	Foster Road West of Anglesey Road	3.3	40	11,088	1.1
L17	Foster Road/ Bury Road Slowdown	3.5	35	11,088	1.1
L18	Bury Road	7	40	22,176	0.9
L19	Bury Road Lights Slowdown	10	16	22,176	0.9
L20	Privett Road Lights Slowdown	7	16	22,176	0.9
L21	Privett Road	6	40	22,176	0.9
L22	The Avenue Slowdown	8.1	16	2,183	0.9
L23	The Avenue	6.3	35	2,183	0.9
L24	Ann's Hill Road Slowdown	8.6	16	8,247	1.0
L25	Ann's Hill Road	8.8	40	8,247	1.0

B10 Reference should be made to **Figure 6** within **Appendix A** for a graphical representation of the road link locations used within the verification assessment.

B11 The road width and mean vehicle speed shown in **Table AB1** remained the same for the 2030 scenario. A summary of the 2030 traffic data is shown in **Table AB2 and Table AB2.1**.

Table AB2 - 2030 DM Traffic Data

Road Link		24 Hr AADT Flow	HDV Prop (%)
L1	Site Access	0	0.0
L2	Dolphin Way South	0	0.0
L3	Dolphin Way North	0	0.0
L4	Dolphin Way Slowdown	0	0.0
L5	Clayhall Road	2,186	2.0
L6	Fort Road	2,186	2.0
L7	Fort Road Roundabout Slowdown	2,186	2.0
L8	Fort Road/ Anglesey Road Roundabout	6,414	1.1
L9	Anglesey Road Roundabout Slowdown	8,528	1.0
L10	Stokes Bay Road Roundabout Slowdown	8,528	1.0
L11	Anglesey Road	8,528	1.0
L12	Anglesey Road/ Foster Road Slowdown (Northbound)	4,264	1.0
L13	Anglesey Road/ Foster Road Slowdown (Southbound)	4,264	1.0
L14	Foster Road East of Anglesey Road	11,411	1.1
L15	Foster Road between Slip roads	11,411	1.1
L16	Foster Road West of Anglesey Road	11,411	1.1
L17	Foster Road/ Bury Road Slowdown	11,411	1.1
L18	Bury Road	22,821	0.9
L19	Bury Road Lights Slowdown	22,821	0.9
L20	Privett Road Lights Slowdown	22,821	0.9
L21	Privett Road	22,821	0.9
L22	The Avenue Slowdown	2,246	0.9
L23	The Avenue	2,246	0.9
L24	Ann's Hill Road Slowdown	8,487	1.0
L25	Ann's Hill Road	8,487	1.0

Table AB2.1 - 2030 DS Traffic Data

Road Link		24 Hr AADT Flow	HDV Prop (%)
L1	Site Access	0	0.0
L2	Dolphin Way South	0	0.0
L3	Dolphin Way North	0	0.0
L4	Dolphin Way Slowdown	0	0.0
L5	Clayhall Road	2,186	2.0
L6	Fort Road	2,186	2.0

Road Link		24 Hr AADT Flow	HDV Prop (%)
L7	Fort Road Roundabout Slowdown	2,186	2.0
L8	Fort Road/ Anglesey Road Roundabout	6,414	1.1
L9	Anglesey Road Roundabout Slowdown	8,528	1.0
L10	Stokes Bay Road Roundabout Slowdown	8,528	1.0
L11	Anglesey Road	8,528	1.0
L12	Anglesey Road/ Foster Road Slowdown (Northbound)	4,264	1.0
L13	Anglesey Road/ Foster Road Slowdown (Southbound)	4,264	1.0
L14	Foster Road East of Anglesey Road	11,411	1.1
L15	Foster Road between Slip roads	11,411	1.1
L16	Foster Road West of Anglesey Road	11,411	1.1
L17	Foster Road/ Bury Road Slowdown	11,411	1.1
L18	Bury Road	22,821	0.9
L19	Bury Road Lights Slowdown	22,821	0.9
L20	Privett Road Lights Slowdown	22,821	0.9
L21	Privett Road	22,821	0.9
L22	The Avenue Slowdown	2,246	0.9
L23	The Avenue	2,246	0.9
L24	Ann's Hill Road Slowdown	8,487	1.0
L25	Ann's Hill Road	8,487	1.0

B12 Reference should be made to **Figure 6** within **Appendix A** for a graphical representation of the road links used within the assessment of Haslar IRC's operational period.

Emission Factors

B13 Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 13.1) released in March 2025, which incorporates updated COPERT 5.8 vehicle emissions factors for NO_x, PM and EURO 6 vehicle fleet sub-categories.

NO_x to NO_2 Conversion

B14 Predicted annual mean NO_x concentrations from the dispersion model were converted to NO_2 concentrations using the NO_x to NO_2 Calculator (v.9.1) provided by DEFRA, which is the method detailed within LAQM (TG22)[2].

Meteorological Data

B15 Meteorological data used in this assessment was taken from Thorney Island meteorological station over the period from 1st January 2024 to 31st December 2024 (inclusive).

B16 Thorney Island meteorological station is located at NGR 476420, 102540 which is approximately 15.2 km east of the site and is considered to provide a reasonable representation of conditions, including coastal effects at the proposed site.

B17 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 7** within **Appendix A** for a wind rose of utilised meteorological data.

Roughness Length

B18 The specific roughness length (z_0) values used to represent conditions during the verification process and future scenarios, as well as conditions at Thorney Island meteorological station are summarised in **Table AB3**.

Table B3 - Utilised Roughness Lengths

Location	Roughness Length (m)	ADMS Description
Proposed Development	0.5	Parkland, open suburbia
Thorney Island Met Station	0.2	Agricultural areas (min)

B19 These values of z_0 are considered appropriate for the morphology of the assessment area.

Monin-Obukhov Length

B20 The Monin-Obukhov length provides a measure of the stability of the atmosphere within certain urban or rural contexts. The specific length values used to represent conditions during the verification process and future scenarios, as well as conditions at Thorney Island meteorological station are summarised in **Table B4**.

Table AB4 - Utilised Monin-Obukhov Lengths

Location	Monin-Obukhov Length (m)	ADMS Description
Proposed Development	30	Cities and large towns
Thorney Island Met Station	10	Small towns (<50,000)

B21 This Monin-Obukhov value is considered appropriate for the morphology of the assessment area.

Background Concentrations

B22 DEFRA background concentrations were used to represent baseline concentrations at local monitoring sites used for the verification process and future year concentrations at sensitive receptors within the operational phase model.

B23 **Table AB5** displays the specific background concentrations a utilised to represent baseline conditions at the monitoring locations used within the verification process.

Table AB5 - Predicted Background Pollutant Concentrations for Monitoring Locations

Monitoring Location	DEFRA Grid Square	Pollutant	2024 Predicted Background Concentration (µg/m³)
T, S	460500, 99500	NO_x	15.24
		NO_2	11.50
		PM_{10}	11.24
		$PM_{2.5}$	7.36

B24 **Table AB6** displays the specific background concentrations as predicted by DEFRA, utilised to represent the condition at the receptor locations used within the operational phase model.

Table AB6 - Predicted Background Pollutant Concentrations for Monitoring Locations

Monitoring Location	DEFRA Grid Square	Pollutant	2030 Predicted Background Concentration (µg/m³)
HR1, HR2, HR3	461500, 98500	NO_x	11.35
		NO_2	8.76
		PM_{10}	9.55
		$PM_{2.5}$	6.00
HR4, HR5	460500, 98500	NO_x	10.99
		NO_2	8.50
		PM_{10}	9.66
		$PM_{2.5}$	6.11
HR6 – HR10	460500, 99500	NO_x	11.80
		NO_2	9.09
		PM_{10}	10.58
		$PM_{2.5}$	6.75

B25 Emission factors and predicted background concentrations for the future year (2030) were used in the assessment in order to provide an estimation of actual pollutant concentrations during the operation of the proposed development.

Verification

B26 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.

B27 Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In practice, the differences between modelled and monitored results are likely to be a combination of all of these aspects. The process followed DEFRA guidance provided in LAQM (TG22)[2].

B28 For the purpose of this assessment model verification was undertaken for 2024, using traffic data, meteorological data and monitoring results from this year. DEFRA guidance LAQM (TG22)[2] advises that the initial verification should consider the performance of the model in predicting road sourced NO_x.

B29 GBC undertakes periodic monitoring of NO_2 concentrations at two roadside monitors considered within the assessment extents as shown in **Figure 2**. The automatic monitoring location was not used for verification purposes due to the distance from the automatic monitor to the proposed development.

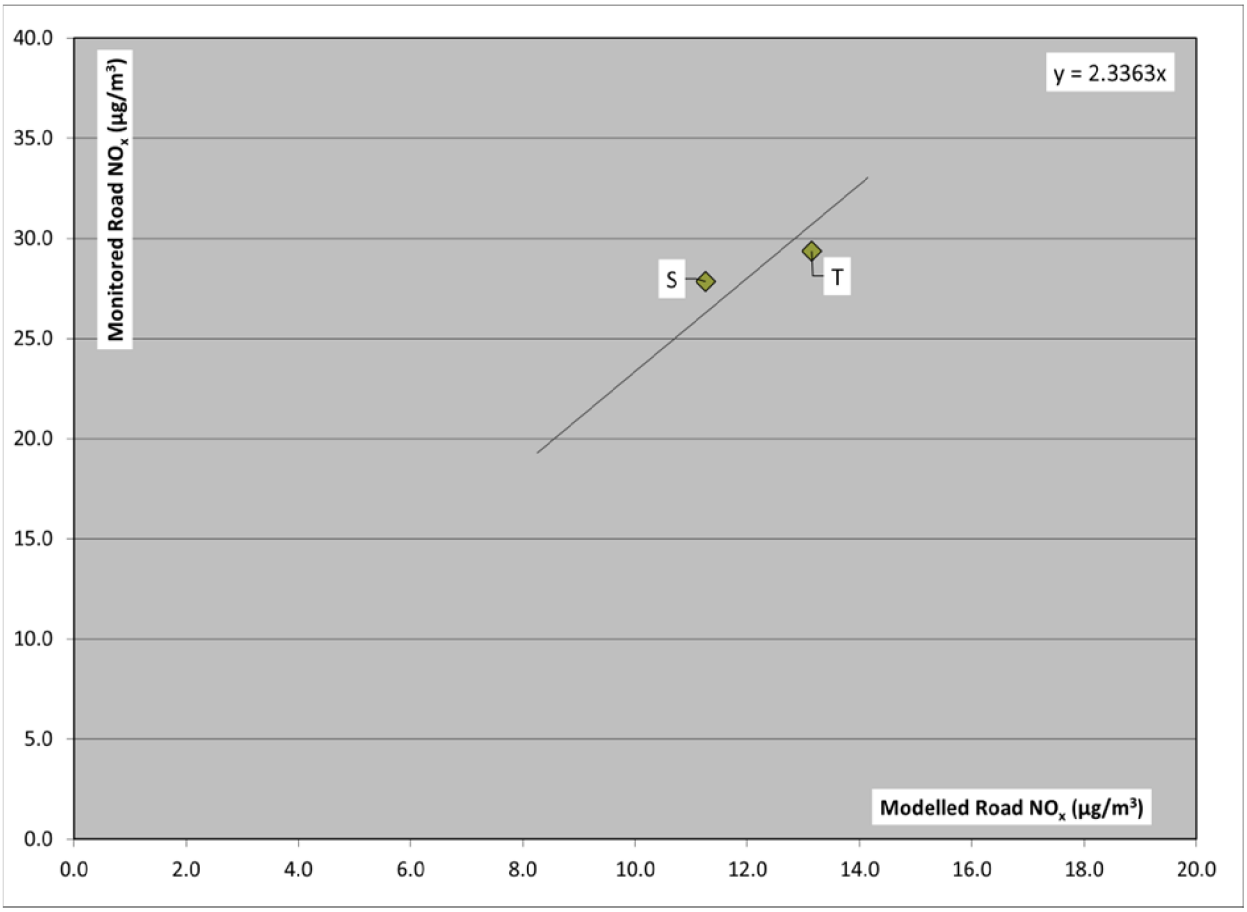
B30 The road contribution to total NO_x concentration was calculated from the monitored NO_2 result for use in the verification process. The monitored and predicted modelled annual mean road NO_x concentrations are summarised and compared in **Table AB17**.

Table AB17 - Comparison of Modelled and Monitored NOx

Site ID	Modelled Road NO_x Concentration (µg/m³)	Monitored Road NO_x Concentration (µg/m³)	% Difference ((Modelled – Monitored)/Modelled)) * 100
T	13.15	29.38	-55%
S	11.26	27.86	-60%

B31 **Table AB17** indicates that the model underestimated pollutant concentrations at the monitoring locations. To calculate the required adjustment factor, the monitored and modelled NO_x road contribution concentrations were graphed and the equation of the trend line based on the linear progression through zero was calculated, as shown in **Graph 1**. In line with LAQM (TG22)[2], the gradient of the line provides the required model road NOx concentration adjustment factor.

Graph 1 - Verification Adjustment Factor



B32 In accordance with LAQM (TG22)[2] a verification factor of 2.3363 was applied to all modelled NO_x concentrations. The adjusted modelled road NOx values were converted to NO_2 concentrations as described previously (paragraph B14) and compared against monitored NO_2 concentrations.

B33 **Table B18** presents the monitored annual mean NO_2 concentrations and the adjusted modelled total NO_2 concentrations.

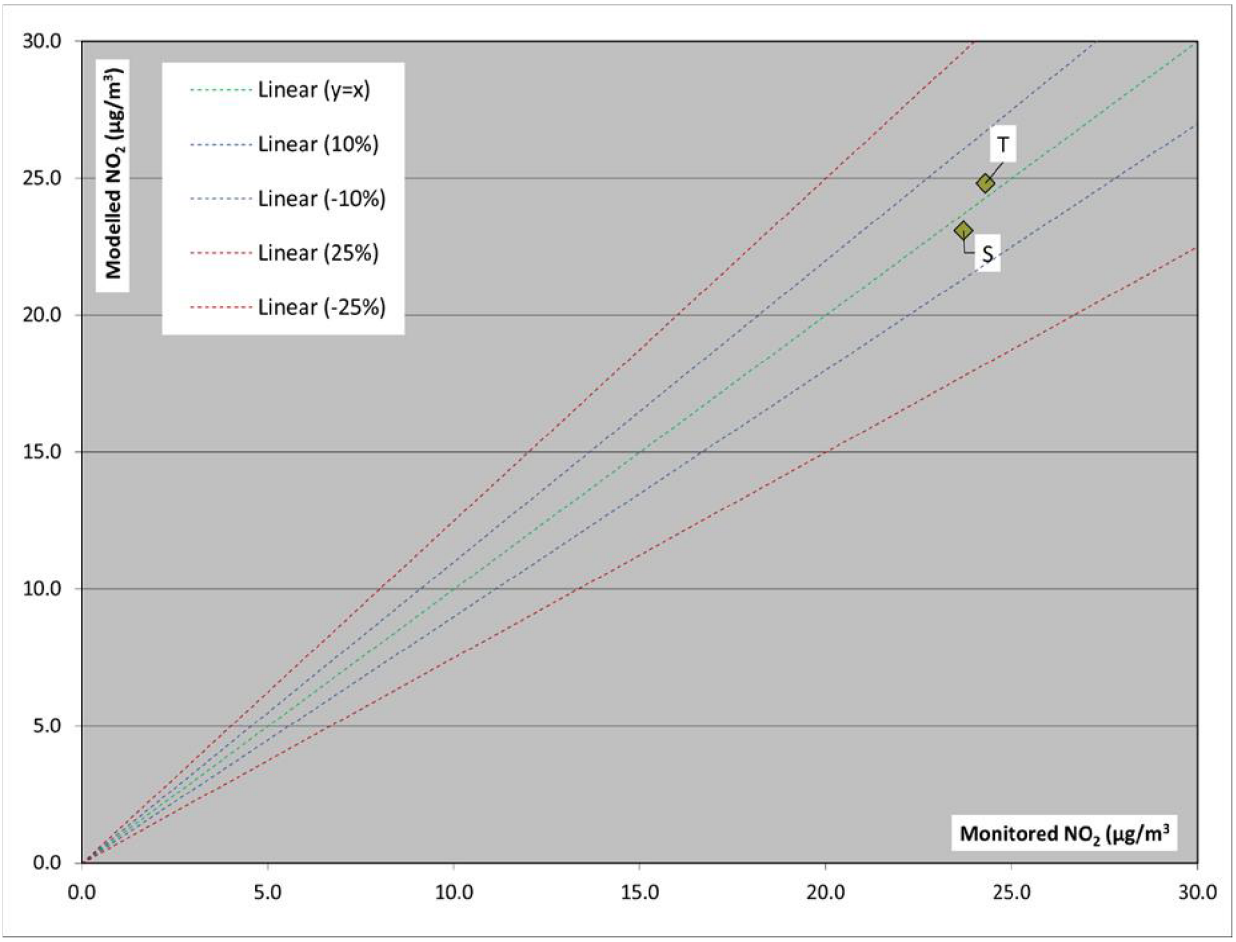
Table AB18 - Comparison of Adjusted Modelled and Monitored NO_2

Site ID	Adjusted Modelled NO_2 Concentration (µg/m³)	Monitored NO_2 Concentration (µg/m³)	% Difference ((Modelled – Monitored)/Modelled)) * 100
T	24.82	24.30	2
S	23.08	23.70	-3%

B34 The percentage difference between modelled and monitored NO_2 concentrations is deemed acceptable. In addition, the modelled results do not show an overall tendency to under or overestimate concentrations. This provides confidence in the model predictions and provide a reasonable representation of pollutant concentrations in accordance with the guidance suggested in LAQM (TG22)[2].

B35 A graphical representation of the adjusted NO_2 concentrations is provided in **Graph 2**.

Graph 2 - Comparison of Monitored and Adjusted Modelled NO_2 Concentrations



B36 As roadside PM monitoring is not undertaken within the assessment extents, the NO_x adjustment factor of 2.3363 was utilised to adjust model predictions of PM in accordance with the guidance provided within LAQM (TG22).

APPENDIX C:
Model Results

PREDICTED CONCENTRATIONS AT SENSITIVE RECEPTORS

Nitrogen Dioxide (NO_2)

Table AC1 - Predicted Annual Mean Concentrations

Potential Impact		Predicted Annual Mean Concentration (µg/m³)		
		DM	DS	Change
R1	2C Fort Road	9.13	9.29	0.16
R2	142 Clayhall Road	9.42	9.63	0.21
R3	38 Fort Road	8.97	9.04	0.07
R4	69 Crescent Road	10.17	10.31	0.14
R5	Stephenson Close	10.18	10.27	0.09
R6	Beechcroft Green Nursing Home	10.77	10.85	0.08
R7	38 Foster Road	10.78	10.81	0.03
R8	11A Foster Road	10.89	10.98	0.09
R9	69 Bury Road	11.89	11.97	0.08
R10	Gosport War Memorial Hospital	12.40	12.53	0.13

C1 As indicated in **Table AC1**, annual mean concentrations were below the relevant AQO at all receptor locations considered. Predicted impacts are summarised in **Table AC2**.

Table AC2 - Predicted Impacts

Potential Impact		% Change in Concentration Relative to AQO	Long Term Average Concentration	IAQM Impact Descriptor
R1	2C Fort Road	0.40	75% or Less	Negligible
R2	142 Clayhall Road	0.53	75% or Less	Negligible
R3	38 Fort Road	0.17	75% or Less	Negligible
R4	69 Crescent Road	0.35	75% or Less	Negligible
R5	Stephenson Close	0.23	75% or Less	Negligible
R6	Beechcroft Green Nursing Home	0.20	75% or Less	Negligible
R7	38 Foster Road	0.08	75% or Less	Negligible
R8	11A Foster Road	0.23	75% or Less	Negligible
R9	69 Bury Road	0.20	75% or Less	Negligible
R10	Gosport War Memorial Hospital	0.32	75% or Less	Negligible

C2 As indicated in **Table AC2** impacts on annual mean NO_2 concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be negligible at all receptor locations.

Particulate Matter (PM_{10})

Table AC3 - Predicted Annual Mean Concentrations

Potential Impact		Predicted Annual Mean Concentration (µg/m³)		
		DM	DS	Change
R1	2C Fort Road	9.80	9.90	0.10
R2	142 Clayhall Road	9.99	10.12	0.13
R3	38 Fort Road	9.70	9.74	0.04
R4	69 Crescent Road	10.60	10.68	0.08
R5	Stephenson Close	10.85	10.91	0.06

Potential Impact		Predicted Annual Mean Concentration (µg/m³)		
		DM	DS	Change
R6	Beechcroft Green Nursing Home	11.75	11.81	0.06
R7	38 Foster Road	11.75	11.77	0.02
R8	11A Foster Road	11.84	11.90	0.06
R9	69 Bury Road	12.57	12.62	0.05
R10	Gosport War Memorial Hospital	12.46	12.53	0.07

C3 As indicated in **Table AC3**, annual mean concentrations were below the relevant AQO at all receptor locations considered. Predicted impacts are summarised in **Table AC4**.

Table AC4 - Predicted Impacts

Potential Impact		% Change in Concentration Relative to AQO	Long Term Average Concentration	IAQM Impact Descriptor
R1	2C Fort Road	0.25	75% or Less	Negligible
R2	142 Clayhall Road	0.32	75% or Less	Negligible
R3	38 Fort Road	0.10	75% or Less	Negligible
R4	69 Crescent Road	0.20	75% or Less	Negligible
R5	Stephenson Close	0.15	75% or Less	Negligible
R6	Beechcroft Green Nursing Home	0.15	75% or Less	Negligible
R7	38 Foster Road	0.05	75% or Less	Negligible
R8	11A Foster Road	0.15	75% or Less	Negligible
R9	69 Bury Road	0.12	75% or Less	Negligible
R10	Gosport War Memorial Hospital	0.17	75% or Less	Negligible

C4 As indicated in **Table AC4** impacts on annual mean PM_{10} concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be negligible at all receptor locations.

Particulate Matter ($PM_{2.5}$)

Table AC5 - Predicted Annual Mean Concentrations

Potential Impact		Predicted Annual Mean Concentration (µg/m³)		
		DM	DS	Change
R1	2C Fort Road	6.13	6.18	0.05
R2	142 Clayhall Road	6.22	6.29	0.07
R3	38 Fort Road	6.07	6.10	0.03
R4	69 Crescent Road	6.60	6.64	0.04
R5	Stephenson Close	6.73	6.76	0.03
R6	Beechcroft Green Nursing Home	7.37	7.40	0.03
R7	38 Foster Road	7.37	7.38	0.01
R8	11A Foster Road	7.42	7.45	0.03
R9	69 Bury Road	7.80	7.82	0.02
R10	Gosport War Memorial Hospital	7.74	7.78	0.04

C5 As indicated in **Table AC5**, annual mean concentrations were below the relevant AQO at all receptor locations considered. Predicted impacts are summarised in **Table AC6**.

Table AC6 - Predicted Impacts

Potential Impact		% Change in Concentration Relative to AQO	Long Term Average Concentration	IAQM Impact Descriptor
R1	2C Fort Road	0.25	75% or Less	Negligible
R2	142 Clayhall Road	0.35	75% or Less	Negligible
R3	38 Fort Road	0.15	75% or Less	Negligible
R4	69 Crescent Road	0.20	75% or Less	Negligible
R5	Stephenson Close	0.15	75% or Less	Negligible
R6	Beechcroft Green Nursing Home	0.15	75% or Less	Negligible
R7	38 Foster Road	0.05	75% or Less	Negligible
R8	11A Foster Road	0.15	75% or Less	Negligible
R9	69 Bury Road	0.10	75% or Less	Negligible
R10	Gosport War Memorial Hospital	0.20	75% or Less	Negligible

C6 As indicated in **Table AC6** impacts on annual mean $PM_{2.5}$ concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be negligible at all receptor locations.

C7 It is therefore considered that the overall impacts as a result of the proposed development are not significant. Further justifications are discussed in **Section 6.5** and **Table 13**.

APPENDIX D:
IAQM Construction Phase Methodology

D1 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 IAQM guidance4. Activities are divided into four types to reflect their different potential impacts. These are:

- Demolition.
- Earthworks.
- Construction.
- Trackout.

D2 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} and $PM_{2.5}$.

D3 The assessment steps are detailed below.

Step 1

D4 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 250m from the site boundary or 50m from the construction vehicle route up to 250m from the site entrance, then the assessment should proceed to Step 2. Additionally, should ecological receptors be identified within 50m of the boundary site or 50m from the construction vehicle route up to 250m from the site entrance, then the assessment should also proceed to Step 2.

D5 Should sensitive receptors not be present within the relevant distances then negligible impacts would be expected and further assessment is not necessary.

Step 2

D6 Step 2 assesses 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 (Step 2A).
- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

D7 The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied. Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in **Table AD1**.

Table AD1 - Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Demolition	• Total building volume greater than 75,000m^3 • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities >12m above ground level

Magnitude	Activity	Criteria
	Earthworks	• Total site area >110,000m^2 • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • >10 heavy earth moving vehicles active at any one time • Formation of bunds >6m in height
	Construction	• Total building volume >75,000m^3 • On site concrete batching or sandblasting
	Trackout	• >50 HDV outward trips per day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100m
Medium	Demolition	• Total building volume 12,000m^3 to 75,000m^3 • Potentially dusty construction material • Demolition activities 6 to 12m above ground level
	Earthworks	• Total site area 18,000m^2 to 110,000m^2 • Moderately dusty soil type (e.g. silt) • 5 to 10 heavy earth moving vehicles active at any one time • Formation of bunds 3m to 6m in height
	Construction	• Total building volume 12,000m^3 to 75,000m^3 • Potentially dusty construction material (e.g. concrete) • On site concrete batching
	Trackout	• 20 to 50 HDV outward trips per day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50m to 100m
Small	Demolition	• Total building volume under 12,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities less <6m above ground level • Demolition during wetter months
	Earthworks	• Total site area less than 18,000m^2 • Soil type with large grain size (e.g. sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <3m in height
	Construction	• Total building volume <12,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	• <20 HDV outward movements in any one day • Surface material with low potential for dust release • Unpaved road length <50m

Step 2B defines the sensitivity of the area around the development site for construction, earthworks and trackout. The factors influencing the sensitivity of the area are shown in **Table AD2**.

Table AD2 - Examples of Factors Defining Sensitivity of an Area

Sensitivity	Receptors	
	Human	Ecological
High	**Dust Soiling** • Users can reasonably expect enjoyment of a high level of amenity; • The appearance, aesthetics or value of their property would be diminished by soiling; and • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • Indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms. **Health Effects** • Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include residential properties. Hospitals, schools, and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	• Internationally or nationally designated site e.g. Special Area of Conservation
Medium	**Dust Soiling** • Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • The appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property would not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Indicative examples include parks and places of work. **Health Effects** • Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).	• Nationally designated site e.g. Sites of Special Scientific Interest

Sensitivity	Receptors	
	Human	Ecological
	• Indicative examples include office and shop workers but will generally not include workers occupationally exposed to PM_{10} , as protection is covered by Health and Safety at Work legislation.	
Low	**Dust Soiling** • Enjoyment of amenity would not reasonably be expected • Property would not be expected to be diminished in appearance, aesthetics, or value by soiling • There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. • Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads. **Health Effects** • Locations where human exposure is transient. • Indicative examples include public footpaths, playing fields, parks and shopping streets.	• Locally designated site e.g. Local Nature Reserve

D8 The sensitivity of the area to dust soiling effects on people and property is shown in **Table AD3.**

Table AD3 - Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<200
High	>100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

D9 **Table AD4** outlines the criteria to determine the sensitivity of the area to human health impacts.

Table AD4 - Sensitivity of the Area to Human Health Impacts

Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<200
High	>32µg/m^3	>100	High	High	High	Medium
		10 - 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low

Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<200
	28 - 32µg/m^3	>100	High	High	Medium	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low
	24 - 28µg/m^3	>100	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	<24µg/m^3	> 100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
	<24µg/m^3	> 100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	>32µg/m^3	>10	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	28 - 32µg/m^3	> 10	Medium	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	24 - 28µg/m^3	>10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	<24µg/m^3	> 10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

D10 **Table AD5** outlines the sensitivity of the area to ecological impacts.

Table AD5 - Sensitivity of the Area to Ecological Impacts

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

D11 Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts. Table AD6 outlines the risk category from demolition activities.

Table AD6 - Dust Risk Category from Demolition

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

D12 **Table AD7** outlines the risk category from earthworks and construction activities.

Table AD7 - Dust Risk Category from Earthworks and Construction

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

D13 **Table AD8** outlines the risk category from trackout.

Table AD8 - Dust Risk Category from Trackout

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

Step 3

D14 Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance 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.

Step 4

D15 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 using effective mitigation.

D16 Experience shows that this is normally possible. Hence the residual effect will normally be not significant.

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