



Air Quality Assessment

**Land North of Solent Road,
Havant**

**April 2021
415989.0000.0000**

Prepared For:
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Table of Abbreviations

IAQM	Institute for Air Quality Management
NO _x	Oxides of nitrogen
LAQM	Local Air Quality Management
NO ₂	Nitrogen dioxide
NPPF	National Planning Policy Framework
AQAL	Air Quality Assessment Limit
AQMA	Air Quality Management Area
Defra	Department for Environment, Food and Rural Affairs
OS	Ordnance Survey
PM ₁₀	Particulate Matter
SSSI	Site of Special Scientific Interest
SAC	Special Area of Conservation
SPA	Special Protection Area
PC	Process contribution
ADMS	Air Dispersion Modelling Software
NO	Nitric oxide
PEC	Predicted Environmental Concentrations

Executive Summary

TRC Companies Ltd. (TRC), was commissioned by Chancerygate (Erdington) Limited (the Client), to undertake an air quality assessment for the proposed development of industrial and office units at Solent Road, Havant, PO9 1DQ (the 'Site').

The proposed development comprises four two storey light-industrial units (combination of B1c, B2 and B8 use) and an office building.

The assessment considers the air quality impacts associated with the operation of the development. Likely changes to air quality in the area, as a result of the proposed development have been considered in relation to the national air quality objectives. Where required, the air quality assessment considers mitigation measures to reduce the effect of the proposed development upon local air quality.

The Site is located within the administrative area of Havant Borough Council which have not declared any Air Quality Management Areas within the borough. Review of background pollution data and local air quality monitoring data indicate that concentrations are well within their relevant national air quality objectives.

There are number of designated nature conservation sites within close proximity of roads likely to be affected by the operational traffic emissions.

The assessment considered the impact of the proposed development both during its construction and operation. During construction, assessment indicated that the risk of the different activities towards dust soiling is large-medium and that for human health impact is low-medium. Following implementation of the appropriate mitigation measures as outlined in the report, the residual impacts during construction would be **insignificant**. These mitigation measures should make up part of a Construction Environmental Management Plan that should be implemented to minimise the potential of adverse construction dust impacts throughout all the relevant construction stages.

The main air quality impacts during operational phase will be from vehicles travelling on the road network. The impact of operational traffic emissions has been considered in relation to human and ecological receptors. The assessment indicated that the impact on the nearest sensitive residential receptors to the Site are **negligible**. Also, the assessment indicated that the impact on designated nature conservation sites, potentially affected by operational traffic, is **negligible**.

In conclusion, it is predicated that the development will have **insignificant** impacts on local air quality during the construction and operational phases.

This Executive Summary is part of this complete report; any findings, opinions, or conclusions in this Executive Summary are made in context with the complete report. TRC recommends that the user reads the entire report for all supporting information related to findings, opinions, and conclusions.

1.0 Introduction

TRC Companies Ltd. (TRC), was commissioned by Chancerygate (Erdington) Limited (the Client), to undertake an air quality assessment for the proposed development of industrial and office units at Solent Road, Havant, PO9 1DQ (the 'Site').

1.1 Current Site Description & Proposed Development

The Site is centred at national grid reference (471090,106155) and consists of a vacant single plot with an area of 14,250m². The Site lies within the administrative area of Havant Borough Council and it is located in an area of the borough which is predominantly mixed-used commercial and residential. The Site is bounded:

- To the north by Brockhampton Springs and Portsmouth Water offices;
- To the east by the Bosmere Medical Practice and residential properties off Brockhampton Lane;
- To the south by Solent Road and A27;
- To the west by residential properties off Manor Court.

The nearest sensitive residential receptors are located on Manor Court to the west at approximately 5m away from the site boundary and off Brockhampton Lane to the east, at a similar distance from site boundaries.

The proposal is to construct four two storey light-industrial units (combination of B1c, B2 and B8 use) and an office building. The light industrial units are of speculative nature and the warehouse elements will be left as shells for fitting out by occupiers to suit their particular needs.

Figures 1.1a and 1.1b show the Site location and 1.2 shows the proposed Site plan.



Figure 1.1a: Site Location (1:2000)

The site plan illustrates the layout of the proposed new building at the University of Southampton. The central feature is a large, multi-story building labeled 'BLOCK A', which is divided into four floors: A1, A2, A3, and A4. To the north of Block A is an 'OFFICE' building. To the east of Block A is 'The Business Medical Centre'. A 'CARE CLINIC' is located near the Business Medical Centre. The site is bounded by 'SOLENT ROAD' to the south and 'BROOKHAMPTON LANE' to the east. The plan includes parking areas, green spaces with trees, and a 'The Old Manor House' is visible to the west.

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development have been considered in relation to the national air quality objectives (NAQOs) to determine their significance. Also, where required, the air quality assessment considers mitigation measures to reduce the effect of the proposed development upon local air quality.

The proposed development will have the potential to generate dust, particulate matter (PM₁₀ and PM_{2.5}), and nitrogen oxides (NOx) emissions during the construction phase. These potential impacts are assessed in accordance with the Institute of Air Quality Management (IAQM) best practice guidance (Holman et al., 2016).

Traffic movements, generated by the proposed development during its operation, will give rise to NOx and PM₁₀ and PM_{2.5} emissions. The impact of these emissions on local air quality will be assessed in accordance with IAQM Guidance on Land-Use Planning & Development Control: Planning for Air Quality (Moorcroft et al., 2017).

The development site is located near several nature conservation areas of national and international significance. These sites may be adversely affected by increases in NOx emissions oxides and nitrogen deposition within the habitats. These impacts will be considered in accordance with the relevant IAQM Guidance on the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Holman et al, 2020).

The development plans do not include any centralised combustion plants (such as boilers and combined heat and power units). Accordingly, this assessment has scoped out plant emissions.

This Air Quality Assessment report covers the following sections:

- Legislation, Planning Policy and Standards;
- Baseline Conditions;
- Construction Impact Assessment;
- Operational Impact Assessment;
- Mitigation Measures; and
- Summary, Conclusions and Recommendations.

1.3 Significant Assumptions

This report presents TRCs observations, findings, and conclusions as they existed on the date that this report was issued. This report is subject to modification if TRC becomes aware of additional information after the date of this report that is material to its findings and conclusions.

The report has been prepared in line with the policy and guidance which is discussed within Section 2 of this report.

The reliability of information provided by others to TRC cannot be guaranteed to be accurate or complete. Performance of this assessment is intended to reduce, but not eliminate, uncertainty regarding environmental conditions associated with the subject site; therefore, the findings and conclusions made in this report should not be construed to warrant or guarantee the subject site, or express or imply, including without limitation, warranties as to its marketability for a particular use. TRC found no reason to question the validity of information received unless explicitly noted elsewhere in this report.

2.0 Legislation, Planning Policy & Guidance

This assessment takes account of the following national, regional and local planning guidance.

2.1 National Legislation

Part IV of the Environment Act 1995 requires local authorities to review and assess the air quality within their boundaries. As a result, the first Air Quality Strategy was adopted in 1997, with national health-based standards and objectives set out for the then, key eight air pollutants of benzene, 1-3 butadiene, carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulphur dioxide.

The purpose of the Air Quality Strategy was to identify areas where air quality was unlikely to meet the objectives prescribed in the regulations. The strategy was reviewed in 2000 and the amended Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2000) was published. This was followed by an Addendum in February 2003 and in July 2007, an updated Air Quality Strategy was published (Defra, 2007).

The pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence based on how each pollutant affects human health.

The air quality objectives applicable in LAQM in England are set out in the Air Quality (England) Regulations 2000, (SI 928), The Air Quality (England) (Amendment) Regulations 2002, (SI 3043) and are shown in Table 2.1 below.

The main air quality pollutants of concern with regards to the development Site, are operational related pollutants namely NO₂ and PM₁₀.

Table 2.1: National Air Quality Objectives and Standards

Air Quality Objectives			
Pollutant	Concentrations	Measured as	Date to be achieved by and maintained thereafter
Nitrogen Dioxide (NO ₂)	200 µg/m ³	1-hour mean not to be exceeded more than 18 times per year	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀)	50 µg/m ³	24-hour mean not to be exceeded more than 35 times per year	31.12.2004
	40 µg/m ³	Annual mean	31.12.2004

Air Quality Standards Regulations, 2010

The air quality limit values set out in EU Directive (2008/50/EC, 2008) are transposed in English law by the Air Quality Standards Regulations (2010). This imposes duties on the Secretary of State relating to achieving the limit values.

In most cases the air quality limit values and air quality objectives have the same pollutant concentration threshold. The key difference is that the Secretary of State for the Environment is required under European Law to ensure the air quality limit values are complied with whereas local authorities are only obliged under national legislation to undertake best efforts to comply with the air quality objectives.

Dust Nuisance

Under provisions in the Environmental Protection Act 1990, dust nuisance is defined as a statutory nuisance:

“Any dust or effluvia arising from an industrial, trade or business premises and being prejudicial to health or a nuisance”

There are currently no standards or guidelines for the nuisance of dust in the UK, nor are formal dust deposition standards specified.

2.2 National Planning Policy

National Planning Policy Framework (2019)

The aim of this document is to set out the Government’s requirements for the planning system. It also aims to enable local people and councils to produce their own distinctive local and neighbourhood plans.

Chapter 15, paragraph 181 of the NPPF “Conserving and enhancing the natural environment” states:

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

2.3 Local Planning Policy

Havant Borough Core Strategy (2011)

This strategy forms part of the adopted local plan which sets the planning framework for the borough until 2026. It contains policies and some detailed development management (DM) policies against which individual planning applications are assessed. When considering planning applications, the council considers all the policies contained in the Core Strategy that are relevant to the proposal.

DM 10 (Pollution) notes that development that may cause pollution of air will only be permitted where national air quality standards or objectives would not be breached.

The strategy also notes that development will not be permitted that would cause harm to internationally designated habitats in the borough. These designations include Special Protection Areas (SPAs); Special Areas of Conservation (SACs) and Ramsar sites have high levels of protection.

Havant Borough Council's Emerging Local Plan 2016-2036 (2021)

This plan represents the borough's emerging Local Plan 2016-2036. This plan was submitted for examination to the Secretary of State for Housing Communities and Local Government on 12 February 2021. Until adoption, the Submission Local Plan has limited weight in determining planning applications.

It identified several key projects within the borough. The nearest projects to the development site are:

- KP1 Havant Town Centre designated Retail Hub borders the Site to the east;
- H17 Portsmouth Water Headquarters to the north of the Site is due to be converted into 135 dwellings;
- C10 Brockhampton West, further south of the Site is a potential development consisting of a 9.3ha plot which has been designated as potential employment land.

It should be noted that the development site is not included in the emerging local plan 2016-2036.

The emerging local plan also includes the following key related policies:

Policy E22: Amenity and Pollution

Development proposals will only be permitted where:

- Projected levels of air pollution will not have a likely significant effect on the amenity of current or future users of the Site, nearby occupiers or the wider environment; or
- Appropriate mitigation is outlined that will reduce any likely significant negative effects to an acceptable level.

Policy E23: Air Quality

The main air quality related policy of the Submitted Local Plan states that:

- a. Major development proposals will be expected to provide mitigation measures to offset emissions and these measures must be proportionate to the scale and nature of the development; and
- b. Development proposals including 150 or more residential units, 1000sqm of commercial floor space; or developments which are likely to significantly affect traffic flows on the local highway network will only be permitted where:
 - a. Projected emissions will not result in a significant deterioration of current air quality at a location where national air quality objectives or limit values apply; and
 - b. Appropriate mitigation measures are provided to reduce any potential impacts on air quality.

Air Quality Habitat Regulations Assessment for Havant Borough Emerging Local Plan 2016-2036 (2019)

In preparation of the HBC Emerging Local Plan 2016-2036, Ricardo produced an Air Quality Habitat Regulations Assessment (HRA) of road traffic emissions associated with the future housing, employment and infrastructure development within the borough. This HRA was produced in order to identify and address any potential effects associated with future development of the borough on the several designated ecologically sensitive sites within the area.

The Air Quality HRA indicated that pre-mitigation there would be no threat from the HBC Local Plan to the following European designated sites:

- Butser Hill Special Area of Conservation (SAC);

- Chichester and Langstone Harbours (Ramsar & Special Protection Area (SPA));
- Kingley Vale (SAC);
- Pagham Harbour (Ramsar; SPA);
- Portsmouth Harbour (Ramsar; SPA);
- Solent and Dorset Coast (potential SPA);
- Solent and Isle of Wight Lagoons (SAC); and
- Solent and Southampton Water (Ramsar; SPA).

The Air Quality HRA indicated that the HBC Local Plan had the potential, pre-mitigation, to result in adverse air quality impacts at one European designated site (Solent Maritime (SAC)).

In order to tackle the potential adverse impacts at the Solent Maritime SAC, the Air Quality HRA recommended that a joint Nitrogen Action Plan be developed in partnership with Portsmouth City Council. Upon implementation of targeted and appropriate mitigation measures it is expected that any adverse impacts at the site would be prevented.

2.4 Assessment Guidance

IAQM Guidance on the Assessment of Dust from Demolition and Construction (2014)

The document (Holman et al, 2014) provides guidance on how to undertake a construction impact assessment. The impacts of dust depend on the mitigation measures adopted. The emphasis in this document is on classifying the risk of dust impacts from a site, which will then allow appropriate mitigation measures to be identified.

The assessment procedure follows the following four-step framework:

- Step 1: Need for Detailed Assessment;
- Step 2: Assess the Risk of Dust Effect;
- Step 3: Identify the Need for Site-Specific Mitigation; and
- Step 4: Define Effects and their Significance.

Details of this assessment framework are discussed in Section 4.0 of this report.

IAQM Guidance on Land-Use Planning & Development Control: Planning for Air Quality (2017)

This guidance document (Moorcroft et al, 2017) from the IAQM focuses on consideration of air quality within the land-use planning and development control processes.

It provides a two-stage approach for assessing the impacts of a development on local air quality. Stage 1 is intended to screen out smaller development and/or developments where impacts can be considered to have insignificant effects.

Stage 1:

- If any of the following apply:
 - 10 or more residential units or a site area of more than 0.5ha; or
 - More than 1,000 m² of floor space for all other uses or a site area greater than 1ha.

- Coupled with any of the following:
 - the development has more than 10 parking spaces; or
 - the development will have a centralised energy facility or other centralised combustion process.

Stage 2 relates to specific details regarding the proposed development and the likelihood of air quality impacts. These criteria are detailed in Table 2.2.

If none of the criteria are met then there should be no requirement to carry out an air quality assessment for the impact of the proposed development on the local area, and the impacts can be considered to have insignificant effects.

The guidance states that exceeding a screening criterion in Table 2.2 does not automatically lead to the requirement for a Detailed Assessment. A Simple Assessment may be appropriate, if it can be proven that the Site will not have a significant effect on local air quality

This guidance also includes a suggested framework for describing the impacts. This framework is set out in Table 2.3. The assessment framework allows for a practical way of assigning a meaningful description to the degree of an impact from a development. Impact is described by expressing the magnitude of incremental change as a proportion of a relevant assessment level and then to examine this change in the context of the new total concentration and its relationship with the assessment criterion (or Air Quality Assessment Level (AQAL)).

The IAQM impact significance criteria focuses on the long-term impacts. The guidance suggests that assessment of impact severity for a proposed development will be governed by the long-term exposure experienced by receptors and it will not be a necessity to define the significance of effects by reference to short-term impacts. The severity of the impact will be substantial when there is a risk that the relevant AQAL for short-term concentrations is approached through the presence of the new source, taking into account the contribution of other prominent local sources.

Table 2.2: Indicative criteria for requiring an air quality assessment

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight).	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
3. Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
5. Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
6. Have an underground car park with extraction system	The ventilation extract for the car park will be within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. NB. this includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.	Typically, any combustion plant where the single or combined NO _x emission rate is less than 5 mg/sec* is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing NO ₂ concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

*As a guide, the 5 mg/s criterion equates to a 450 kW ultra-low NO_x gas boiler or a 30kW CHP unit operating at <95mg/Nm³. Users of this guidance should quantify the NO_x mass emission rate from the proposed plant, based on manufacturers' specifications and operational conditions.

Table 2.3: Long-term Impact Descriptors for Individual Receptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

IAQM Guidance on Assessing Air Quality Impacts on Designated Nature Conservation Sites (2020)

This guidance document (Holman et al, 2020) from the IAQM focuses on the impact of air quality on designated nature conservation sites. The document provides a three-stage approach for assessing the impacts of a development on nearby designated nature conservation sites. The three stages are:

Stage 1 - Scoping

Determine whether a development could have a negative impact on a sensitive designated site:

- If there are no designated sites sensitive to air pollution within 200 m of a road, then no further assessment is required;

- If a qualifying site is found, the Design Manual for Roads and Bridges (DMRB)¹ traffic screening criteria, should be considered. These criteria include the AADT changes flows on a given road of 1000 vehicles or 200 heavy duty vehicles (HDVs);
- In-combination effects caused by other developments in the area should also be considered.

A quantitative air quality assessment is required if a designated site is found to match the scoping criteria.

Stage 2 - Quantification

Calculate the concentrations and deposit rates:

- Using dispersion modelling determine the process contribution (PC) and the in-combination impacts, found by adding the PCs from the other developments in the area;
- Add the PC to the baseline concentration/deposition rates to determine the concentration/deposition rates;
- Changes in deposition rates (i.e. PC) resulting from the project or plan for the pollutants of interest are typically derived from the product of the atmospheric concentration and the deposition velocity. The best available estimate of the deposition velocity available should be used for this calculation. The deposition velocity depends on the vegetation type at the location of interest.

Stage 3 – Screening

Compare the calculated figures with relevant levels outlined by the Environment Agency:

- Calculate the PC, for each site, and for each habitat within each site, as a percentage of the relevant critical level/load considering the site alone and with in-combination effects; and
- Determine whether the impacts will be significant and if further evaluation by an ecologist is required;
- In the case of EA permitting, an increment of 1% (or less) of the relevant long-term critical level or critical load alone is considered inconsequential. A change of such magnitude is challenging to measure and difficult to distinguish from natural fluctuations in measured data. For this reason, and others, it has been used as a precautionary screening criterion;
- The 1% threshold has become widely used as a way to define a reasonable quantum of long-term pollution which is not likely to be discernible from fluctuations in background/measurements; and
- The 1% screening criterion is not a threshold of harm and exceeding this threshold does not, imply damage to a habitat.

¹ The Design Manual for Roads and Bridges (DMRB) published by Highways England (formerly the Highways Agency)

3.0 Baseline Air Quality Conditions

Baseline air quality information was gathered from the following sources:

- Defra UK Air Information Resource (UK AIR) website: Air Quality Management Areas (AQMA)²;
- Defra UK AIR: Background Mapping data for local authorities³;
- Havant Borough Council: 2019 Air Quality Annual Status Report; and
- Defra Magic Maps⁴.

3.1 Local Air Quality Management

The Environment Act 1995 introduced the Local Air Quality Management (LAQM) regime which places responsibility on local authorities to review and assess air quality in their areas of jurisdiction. Where national air quality objectives are not likely to be met, local authorities are required to and designate AQMA and produce an air quality action plans describing the air pollution reduction measures they will put in place. Havant Borough Council (HBC) have not declared any AQMA within the borough.

3.2 Background Pollution Maps

Defra's website includes estimated background air pollution data for NO_x and NO₂, PM₁₀ and PM_{2.5} for each 1 km by 1 km OS grid square. Background pollutant concentrations are estimated using the reference year of 2018 for ambient monitoring and meteorological data. The website also includes projections in pollutant concentrations up to the year 2030. Estimated NO_x, NO₂ and PM₁₀ and PM_{2.5} background concentrations for the current year 2021 have been taken from the nearest OS grid square to the Site and are shown in Table 3.2. Results show that annual mean background concentrations are all well below their relevant objectives.

The website currently notes that projections in the 2018 background maps are based on assumptions which were current before the Covid-19 outbreak in the UK. In consequence these maps do not reflect short or longer term impacts on emissions in 2020 and beyond resulting from behavioural change during the national or local lockdowns.

Table 3.1: Defra's 2021 Mapped Background Concentrations

Pollutant	Annual Mean Concentrations (µg/m ³)
NO _x	23.1
NO ₂	16.5
PM ₁₀	14.6
PM _{2.5}	10.5

Site OS Coordinates: 471090 , 106155

Background OS Coordinates: 471500,106500

² <https://uk-air.defra.gov.uk/aqma/>

³ <https://uk-air.defra.gov.uk/data/laqm-background-home>

⁴ <https://magic.defra.gov.uk/MagicMap.aspx>

3.3 Local Air Quality Monitoring Data

HBC did not operate any automatic monitoring sites during 2018 however they did operate 37 non-automatic (passive) diffusion tubes, which monitor nitrogen dioxide (NO₂). The locations of the nearest monitoring sites as well as the reported annual NO₂ concentrations are presented in Figure 3.1 and Table 3.2.

Table 3.2 shows the annual mean NO₂ concentrations at the nearest monitoring sites. The data indicate that all monitoring sites nearest to the Site, except for Tube 19 (Position B), recorded levels within the national objective of 40µg/m³ between 2016 and 2018. NO₂ concentrations at Tube 19 represents kerbside concentrations (within 1m from the road) and do not represent relevant exposure. No breaches of the national NO₂ objective value have been identified at any point where the annual average exposure objective applies.

Table 3.2: Details of NO₂ Annual Mean Concentrations from Non-Automatic Monitoring near the Development

Tube ID	OS Grid Reference (m)		Site Type	Distance and Direction from Site (m)	NO ₂ Annual Mean Concentrations (µg/m ³)		
	X	Y			2016	2017	2018
2	471742	105794	Suburban	670	28.0	25.6	25.8
7 (Position B)	471180	106063	Urban Centre	70	28.1	26.7	25.3
19 (Position B)	471640	105794	Kerbside	600	56.3	46.0	47.7
20	471693	105920	Urban Centre	600	28.9	30.7	27.1
29	472019	105800	Suburban	950	n/a	24.2	25.0
T2	471683	105809	Unclassified	630	n/a	n/a	25.3

Values in **bold** exceed the 40µg/m³

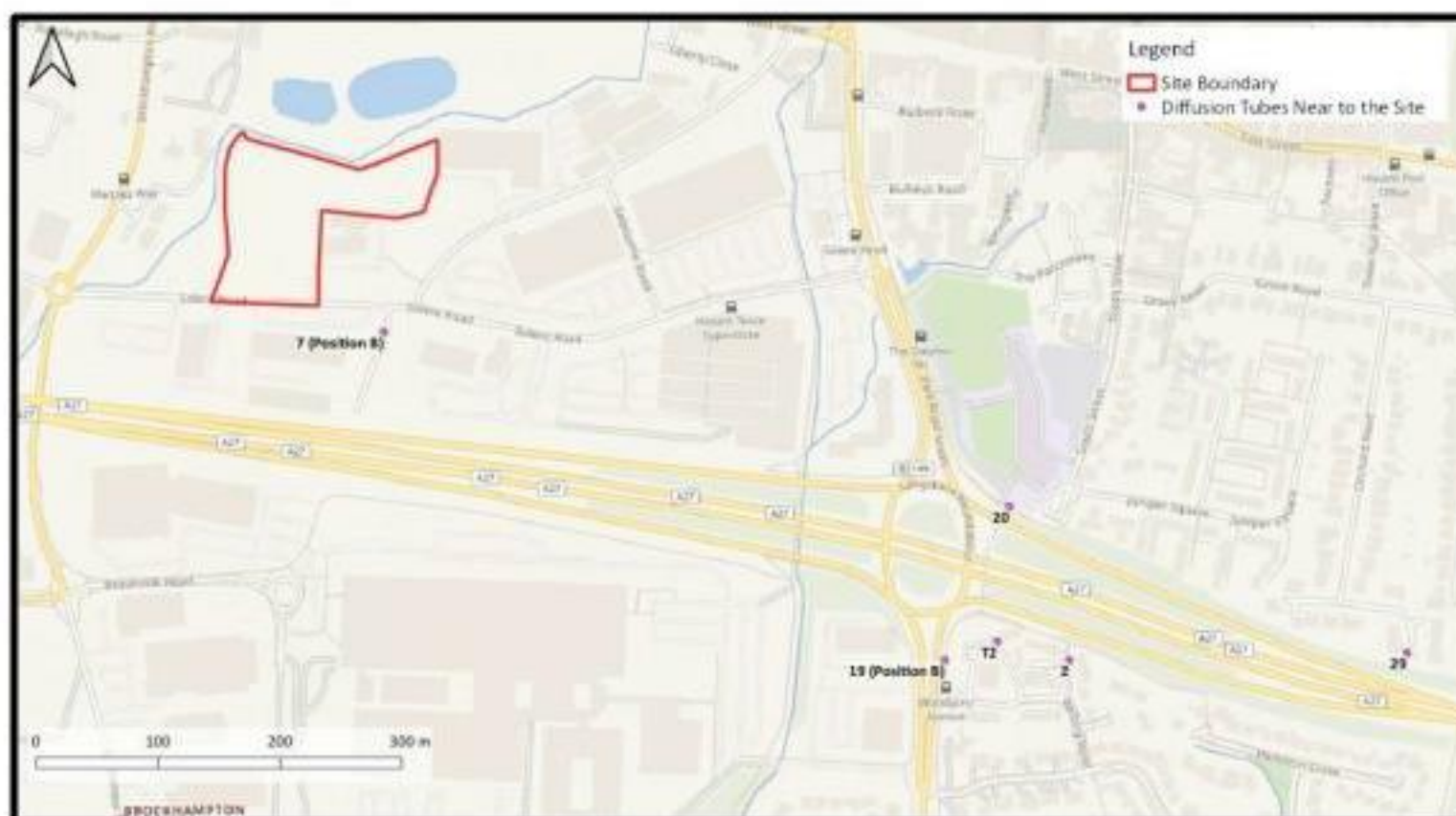


Figure 3.1: Nearest Monitoring Sites to the Application Site

3.4 Designated Nature Conservation Sites

Magic Maps was used to check for any designated nature conservation sites, which are likely to be affected by the proposed development in accordance with the distance screening criteria detailed in Section 2.4 of this report and are shown in the table below. The search indicated that there are several designated nature conservation sites within 200m of roads affected by the operational vehicle movements and will therefore be considered further on as part of this assessment.

Table 3.3: Ecologically Sensitive Sites Nearest to the Application Site (Source: MAGIC Maps)

Name	Classification	Distance and Direction from Site (m)	Nearest Potentially Affected Roads (m)
Chichester & Langstone Harbours	SPA, Ramsar, SSSI	960 SW	Adjacent to A27 and A3023
Solent Maritime	SAC	960 SW	Adjacent to A27 and A3023
Hayling Billy/West Hayling	Local Nature Reserve (LNR)	1980 SE	Adjacent to A3023
Farlington Marshes	Local Nature Reserve (LNR)	2100 SW	Adjacent to A27



Figure 3.2: Ecologically Sensitive Sites Nearest to the Application Site

4.0 Construction Impact Assessment

4.1 Methodology

The construction effects have been assessed using the qualitative approach described in the latest IAQM guidance (Holman et al, 2014). The guidance applies to the assessment of dust from construction activities.

The main impacts that may arise during construction of the proposed development are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes;
- Elevated PM₁₀ concentrations as a result of dust generating activities on-Site; and
- An increase in NO₂ and PM₁₀ concentrations due to exhaust emissions from NRMM and vehicles accessing the Site.

The IAQM guidance considers the potential for dust emissions from four dust generating activities:

- Demolition: Removal of an existing structure(s);
- Earthworks: Process of soil stripping, ground levelling, excavation and land capping;
- Construction of new structures; and
- Trackout: The transport of dust and dirt from the Site onto the public road network where it may be deposited and then re-suspended by vehicles using the network.

For each of these dust-generating activities, the guidance considers three separate effects:

- Annoyance due to dust soiling;
- The risk of health effects due to a significant increase in PM₁₀ exposure; and
- Harm to ecological receptors.

The receptors can be human or ecological and are chosen based on their sensitivity to dust soiling and PM₁₀ exposure.

The methodology takes into account the scale to which the above effects are likely to be generated (classed as small, medium or large), along with the levels of background PM₁₀ concentrations and the distance to the closest receptor, in order to determine the sensitivity of the area. This is then taken into consideration when deriving the overall risk for the Site. Suitable mitigation measures are also proposed to reduce the risk of the Site.

The assessment steps are summarised below:

Step 1: Need for Assessment

The first step is the initial screening for the need for a detailed assessment. According to the IAQM guidance, an assessment is required where there are sensitive receptors within 350m of the Site boundary (for ecological receptors that is 50m) and/or within 50m of the route(s) used by the construction vehicles on the public highway and up to 500m from the Site entrance(s).

Step 2: Assess the Risk of Dust Impacts

This step is split into three sections as follows:

- 2a. Define the potential dust emission magnitude
- 2b. Define the sensitivity of the area
- 2c. Define the risk of impacts

Each of the dust-generating activities is given a dust emission magnitude depending on the scale and nature of the works (step 2a) based on the criteria shown in Table A1 (Appendix A).

The sensitivity of the surrounding area is then determined (step 2b) for each dust effect from the above dust-generating activities, based on the proximity and number of receptors, their sensitivity to dust, the local PM₁₀ background concentrations and any other site-specific factors. Tables A2 to Table A5 (Appendix A) show the criteria for defining the sensitivity of the area to different dust effects.

The overall risk of the impacts for each activity is then determined (step 2c) prior to the application of any mitigation measures (Table A3, Appendix A) and an overall risk for the Site derived.

Step 3: Determine the Site-specific Mitigation

Once each of the activities is assigned a risk rating, appropriate mitigation measures are identified. Where the risk is negligible, no mitigation measures beyond those required by legislation are necessary.

Step 4: Determine any Significant Residual Effects

Once the risk of dust impacts has been determined and the appropriate dust mitigation measures identified, the final step is to determine whether there are any residual significant effects.

Step 5: Prepare a Dust Assessment Report

The last step of the assessment is the preparation of a Dust Assessment Report which is covered within this report.

4.2 Results

The Site is a vacant plot of land except for a tennis court in the northeast section of the Site and is surrounded by mixed residential/commercial land use. The Site is bounded to the south by Solent Road and the closest residential receptors are located 10m east and 16m west of the Site.

Earthworks and Construction Dust Sensitive Receptors

The precise behaviour of dust, its residence time in the atmosphere, and the distance it may travel before being deposited would depend upon several factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

Figure 4.1 shows a graphical representation of the 20m, 50m, 100m, 200m and 350m earthworks and construction dust buffer zones around the Site while Table 4.1 summarises the receptors that may be affected during these phases.

Table 4.1: Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Residential Receptors (High Sensitivity)	Approximate Number of Non-Residential Receptors (Med – Low Sensitivity)
Less than 20	1-10	1-10
20 - 50	10-100	10-100
50 - 100	10-100	10-100
100 - 200	100+	100+
200 – 350	100+	100+



Figure 4.1: Earthworks and Construction Buffer Zones (m) around the Application Site

Trackout Dust Sensitive Receptors

Figure 4.2 shows the 20m and 50m trackout dust buffer zones around the potentially affected roads, extending 500m from the Site entrance. Table 4.2 summarises the receptors that may be affected during this phase.

Table 4.2: Trackout Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Residential Receptors (High Sensitivity)	Approximate Number of Non-Residential Receptors (Med – Low Sensitivity)
Less than 20	1-10	10-100
20 - 50	10-100	10-100



Figure 4.2: Trackout Buffer Zones (m) around the Application Site

Potential Dust Emission Magnitude

As outlined in the previous methodology section as well as in the criteria presented in Table A1 (see Appendix A), each dust-generating activity has been assigned a dust emission magnitude as shown in Table 4.3.

Table 4.3: Dust Emission Magnitude for Construction Activities

Activity	Dust Emission Magnitude	Justification
Earthworks	Large	Total Site area >10,000m ² Potentially dusty soil type (e.g. Clay, which will be prone to suspension when dry due to small particle size)
Construction	Medium	Total building volume 25,000 - 100,000m ³ Potentially dusty construction material (e.g. Concrete)
Trackout	Medium	10 – 50 HDV (>3.5t) outward movements in any one day

Sensitivity of the Area

In terms of earthwork and construction activity, the sensitivity of the area to dust soiling has been designated as medium due to The Bosmere Medical Practice as well as 1-10 residential properties (high sensitivity) being within 20m of the Site.

Sensitivity of the area to dust soiling, during trackout activities, is designated as high due to 10-100 residential properties (high sensitivity) being within 20m of roads potentially affected by construction vehicles.

According to Defra's background maps, annual mean PM₁₀ is 14.6µg/m³. Despite the Bosmere Medical Practice as well as 1-10 residential properties (high sensitivity) being within 20m of the Site, sensitivity of the area to human health impacts, during the earthwork and construction activities, is expected to be low due to the low PM₁₀ background concentrations.

During trackout activities, sensitivity of the area to human health impacts is expected to be low. Despite there being more residential properties within 50m of potentially affected roads, the low background annual mean PM₁₀ concentrations mean potential impacts are unlikely.

Ecological receptors have not been included in this construction assessment due to there being no designated sites within 50m of the Site nor within 50m of potentially affected roads up to 500m from the Site entrance. This is in accordance with IAQM Guidance.

The overall sensitivity of the area to dust soiling and human health is summarised in Table 4.4.

Table 4.4: The Sensitivity of the Area

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

Risk of Impacts

The risk of dust impacts for relevant construction activities are summarised in Table 4.5. These results consider both the potential dust emission magnitude and the sensitivity of the area. Results show that the impact is considered **medium-large** in terms of dust soiling and **low-medium** in terms of impact on human health. It is acknowledged these activities are temporary in nature and will be mitigated through implementation of good industry practices, appropriate to the level of risk.

Table 4.5: The Risk of Dust Impacts

Activity	Sensitivity of the Surrounding Area		
	Earthworks	Construction	Trackout
Dust Soiling	Medium-Large	Medium	Medium-Large
Human Health	Medium	Low-Medium	Low-Medium

5.0 Operational Impact Assessment

5.1 Human Receptors

Traffic generated by the development during its operation will give rise to NO_x and PM₁₀ emissions which will have the potential to affect human receptors. The likelihood of air quality impacts on nearby human receptors has been assessed in accordance with the IAQM criteria set out in Table 2.2 of this report.

The nearest sensitive residential receptors to the Site are <5m east on Brockhampton Lane and <5m west on Manor Court. There are also residential receptors near to roads potentially affected by the proposed development, these are south of Solent Road further along Brockhampton Lane and near to the Havant Bypass (A27) roundabout. These locations are presented in Figure 5.1.

Traffic movements have been provided by Mode transport consultants. The data presented in Table 5.1 provides the overall total vehicle movements that will be generated by the development. Also, the data provides information about the percentage of trips generated on the A27 and the A3023.

Figures in Table 5.1 indicate that HDV movements are well within the 100 AADT movements criterion. However, LDV movements exceed the 500 movements criterion outlined by the IAQM. Given that background pollution and local air quality monitoring data (presented in Section 3 of this report) show that concentrations are well within their relevant national air quality objectives, it is assessed that the impact of vehicle emissions on local air quality is predicted to be negligible.

Table 5.1: Predicted 24-hr Annual Average Daily Traffic (AADT) Movements Generated by the Site During Operation

	AADT Movements			
	IAQM Threshold*	Total Site Vehicle Movements	A27 West (31% of total vehicle movements)	A3023 (2% of total vehicle movements)
LDV	500	776	241	16
HDV	100	42	13	1
Total Vehicles		818	254	17

* IAQM Guidance on Land-Use Planning & Development Control: Planning for Air Quality (2017)

5.2 Designated Nature Conservation Sites (Ecological Receptors)

Traffic emissions (in particular NO_x emissions) will have potential impacts on ecological receptors located within 200m of roads affected by operational site traffic. The roads A27 and A3023 run within proximity of several designated nature conservation sites and have therefore been specifically considered in this assessment (see Figure 5.1). The predicted vehicle movements, generated during the Site operations, on these two roads is presented in Table 5.1. Figures indicate that the predicted AADT flows are well below the DMRB traffic screening criteria of 1000 AADT or 200 HGVs.

The IAQM Guidance (Holman et al, 2020) states the effect of new projects and plans both alone and in-combination with other projects and plans, i.e. the effects of the plan or project being assessed must also be considered together with the effects of other relevant projects and plans. This is because a series of individually modest impacts may, in-combination, produce a significant effect on a habitat/species.

The in-combination effects have been considered in this assessment by reviewing the 2016 Air Quality HRA for Havant (see section 2.3). This HRA considered the impact of future developments, included in the

emerging local plan 2016-2036, on all nationally and international designated nature conservation sites in the borough. The Air Quality HRA indicated that the emerging local plan had the potential, pre-mitigation, to result in adverse air quality impacts at one European designated site namely Solent Maritime (SAC)).

In order to tackle the potential adverse impacts at the Solent Maritime SAC, the Air Quality HRA recommended that a joint Nitrogen Action Plan be developed in partnership with Portsmouth City Council. Upon implementation of targeted and appropriate mitigation measures it is expected that any adverse impacts at the site would be prevented.

Accordingly, it is assessed that the impact of the proposed development on designated sites, both alone and in-combination with other projects and plans, is negligible.

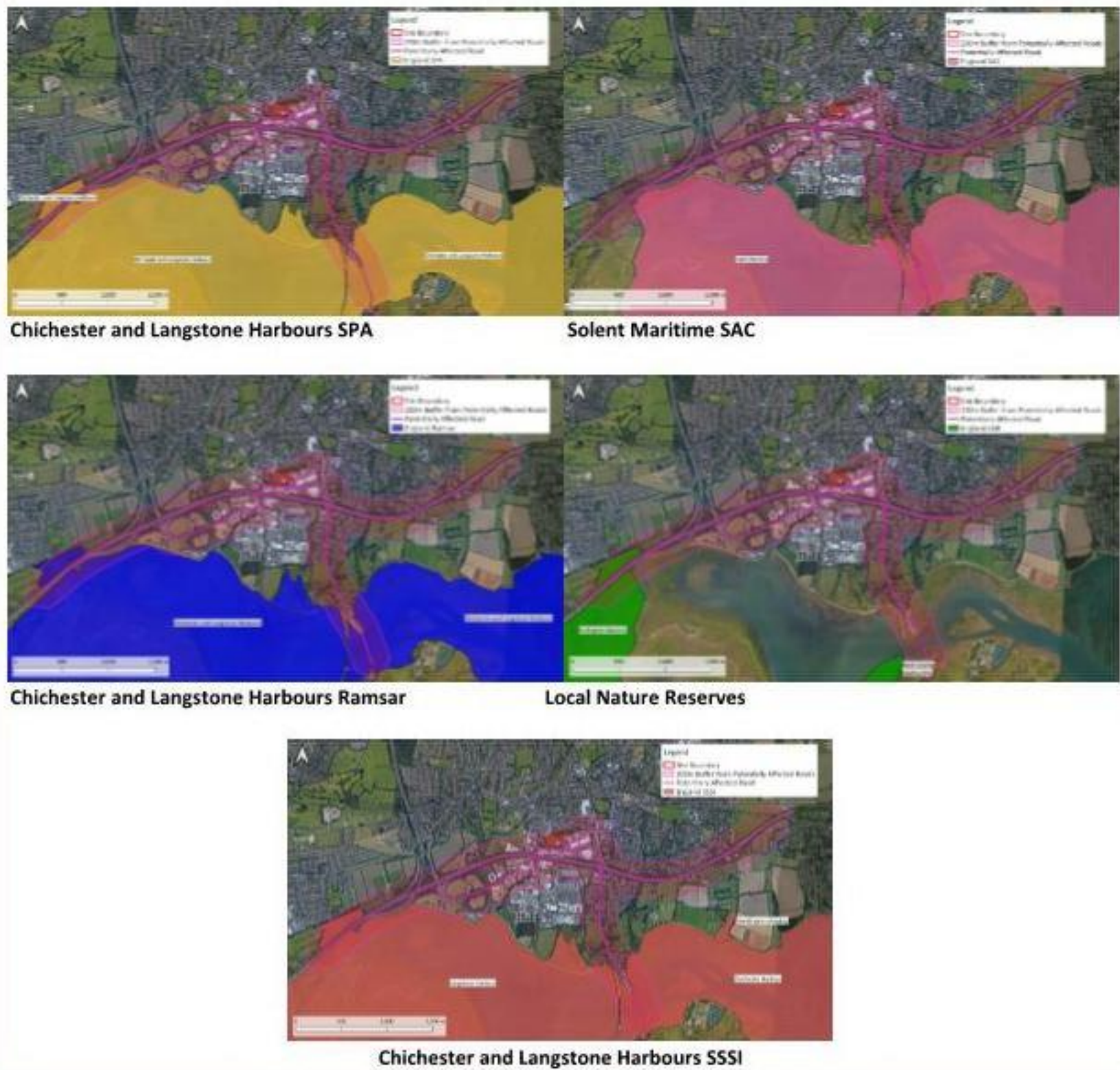


Figure 5.1: Designated Nature Conservation Sites Potentially Affected by Operational Traffic

6.0 Mitigation Measures

6.1 Construction Phase

Construction Dust

The mitigation measures outlined below should make up part of a Construction Environment Management Plan (CEMP) that should be implemented to minimise the potential of adverse construction dust impacts throughout all the relevant construction stages.

Earthworks and Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out unless required for a particular process;
- Mix large quantities of cement, grouts and other similar materials in enclosed areas remote from site boundaries and potential receptors;
- 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; and
- For small supplies of fine powder ensure bags are sealed after use and are stored appropriately to prevent dust release.

Trackout

- Ensure any vehicles entering and leaving site are securely covered to prevent escape of materials during transport;
- Ensure all vehicles switch off engines when stationary, no idling vehicles;
- Routinely clean public roads and access routes using wet sweeping methods; and
- Avoid dry sweeping of large areas.

General Mitigation Measures

- Ensure regular cleaning of hard standing surfaces using wet sweeping methods;
- Display the head or regional office contact information, and the name and contact details of person(s) accountable for air quality on the site boundary;
- Log all air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record all measures taken. Make the complaints log available to the Local Authority when asked;
- Carry out regular on-site and off-site inspections to monitor dust soiling effects, with cleaning to be provided if necessary. Increase the frequency of inspections when activities with a high potential to produce dust are being carried out;
- Erect barriers around the site, any dusty activities and stockpiles (to be covered);
- Screen areas of the building, where dust producing activities are taking place, with debris screens or sheeting;
- Fully enclose site or specific operations where there is a high potential for dust production and the Site is active for an extensive period;
- Remove materials that have a potential to produce dust as soon as possible, unless being re-used. If they are to be re-used, on-site covers should be used;
- Ensure all vehicles switch off engines when stationary, no idling vehicles;

- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine sprays on such equipment wherever possible; and
- Avoid bonfires and the burning of waste materials.

It is important that attention is paid to any construction activity that takes place near the site boundary, particularly at the location closest to sensitive receptors.

The implementation of the specific mitigation measures given above within a CEMP will ensure that the potential adverse impacts from construction dust during all construction stages are avoided. It is noted in the IAQM Guidance (Holman et al, 2014) that through the use of effective mitigation, the effects of dust associated with construction activity will not normally be significant.

Construction Traffic and Plant

As previously stated, there is potential for air pollutant impacts to arise from construction plant and vehicles associated with the scheme. Currently the number of construction vehicles and construction plant have not been confirmed, however BAT (Best Available Technology) should still be implemented during the construction phase.

The recommended construction traffic and plant mitigation measures are as follows:

- All vehicles should switch off engines when stationary, no idling vehicles;
- All non-road mobile machinery (NRMM) should use ultra-low sulphur diesel (ULSD) where available;
- Minimise the movement of construction traffic around the site;
- Maximise efficiency (this may include alternative modes of transport and maximising vehicle utilisation by ensuring full loading and efficient routing);
- Vehicles should be well maintained and kept in a high standard of working order;
- Avoid the use of diesel or petrol-powered generators by using mains electricity or battery powered equipment where possible; and
- Locate plant away from boundaries close to residential areas.

Following the implementation of the measures recommended for inclusion within the CEMP the impact of emissions during construction of the proposed development would be **non-significant**.

6.2 Operational Phase

This assessment indicates that the predicted impacts of the development during operation will be negligible and therefore no further mitigation is required.

7.0 Conclusions

The assessment considered the impact of the proposed development both during its construction and operation. During construction, assessment indicated that the risk of the different activities towards dust soiling is large-medium and that for human health impact is low-medium. Following implementation of the appropriate mitigation measures as outlined in the report, the residual impacts during construction would be **insignificant**. These mitigation measures should make up part of a CEMP that should be implemented to minimise the potential of adverse construction dust impacts throughout all the relevant construction stages.

The impact of operational traffic emissions has been considered in relation to human and ecological receptors. The assessment indicated that the impact on the nearest sensitive residential receptors to the Site are **negligible**. Also, the assessment indicated that the impact on designated nature conservation sites, potentially affected by operational traffic, is **negligible**.

In conclusion, it is predicated that the development will have **insignificant** impacts on local air quality during the construction and operational phases.

8.0 Limitations and Exclusions

8.1 Reliance

The recommendations contained in this report represent TRC's professional opinions, based upon the currently available information, and are arrived at in accordance with currently acceptable professional standards. This report is based upon a specific scope of work requested by the Client. The contract between TRC and its Client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of TRC's Client and anyone else specifically identified in writing by TRC as a user of this report. TRC will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, TRC makes no express or implied warranty as to the contents of this report.

8.2 Third Party Information

TRC has been provided with information from third parties for information purposes only and without representation or warranty, express or implied as to its accuracy or completeness and without any liability on such third parties part to revise or update the information. Where reliance has been provided by third parties to potential purchasers, this is noted in our report.

In performing the services to which this report relates, TRC has relied upon the information obtained from third parties. TRC makes no representation or warranty, express or implied as to the accuracy or completeness of any statement or advice contained within this report that is based upon the information obtained from third parties and to the fullest extent permissible by law we hereby exclude any and all liability we may have in respect of the same, provided that nothing shall be taken as limiting TRC's liability in respect of personal injury (including death) caused by its negligence.

8.3 Interpretation of Findings

TRC's report is based upon the information provided to TRC and TRC's observations made during the subject property reconnaissance. Given the inherent limitations of environmental assessment work, TRC does not guarantee that the subject property is free of additional air pollution sources or considerations, or that latent or undiscovered conditions will not become evident in the future. TRC's report is prepared in accordance with the proposal and the standard terms and conditions agreed between the Client and TRC, and no other warranties, representations, or certifications are made.

9.0 References

The following documents/website were consulted in preparing this report:

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