ALDI, Land North of Afan Way, Aberavon, Port Talbot

Air Quality Assessment

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Air Quality Assessment

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1 INTRODUCTION

1.1 Entran Limited has been commissioned to undertake an assessment of air quality impacts associated with the proposed development of an ALDI foodstore and Starbucks Drive Thru (the 'Proposed Development') at the Land north of Afan Way, Aberavon, Port Talbot, SA12 6LL.

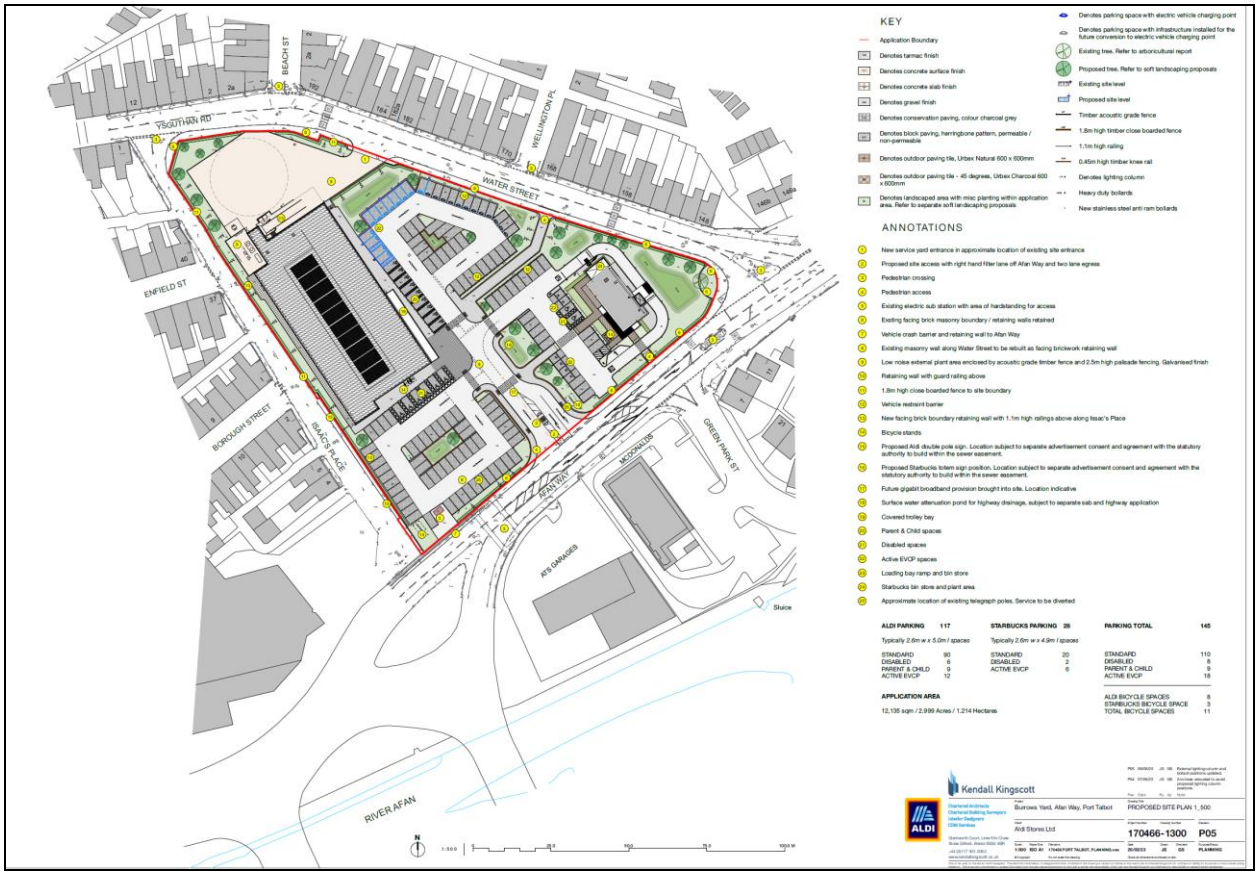
1.2 The proposal comprises the development of a retail foodstore and Starbucks Drive Thru with associated pedestrian and vehicular access, car parking and landscaping. A layout plan of the Site is shown in Figure 1.1.

1.3 Neath Port Talbot Council (NPTC) has declared one Air Quality Management Area (AQMA) in the district due to exceedances of the 24-hour mean PM_{10} objective. The Site is not located within or near an AQMA; the Neath Port Talbot AQMA Taibach/Margam is located approximately 0.8km to the southeast of the Site.

1.4 This report presents the findings of a detailed air quality assessment of the potential impacts of the Proposed Development on local air quality during the construction and operational phases. The source and significance of potential impacts are identified and the measures that should be employed to minimise these impacts are described. Consideration is also given to the suitability of the Site for its proposed end-use with regards to air quality.

1.5 A glossary of common air quality terminology is provided in **Appendix A.**

Figure 1.1: Site Layout Plan



2 LEGISLATION AND POLICY

Air Quality Strategy for England, Scotland, Wales & Northern Ireland

2.1 The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland published in July 2007[1], pursuant to the requirements of Part IV of the Environment Act 2021. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. The AQS is designed to be an evolving process that is monitored and regularly reviewed.

2.2 The AQS sets standards and objectives for ten main air pollutants to protect health, vegetation and ecosystems. These are benzene (C_6H_6), 1,3-butadiene (C_4H_6), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10}, $PM_{2.5}$), sulphur dioxide (SO_2), ozone (O_3) and polycyclic aromatic hydrocarbons (PAHs).

2.3 The air quality standards are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on medical and scientific evidence reviewed by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO). These are general concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects.

2.4 The air quality objectives are medium-term policy-based targets set by the Government which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedances of the standard over a given period.

2.5 For some pollutants, there is both a long-term (annual mean) standard and a short-term standard. In the case of nitrogen dioxide (NO_2), the short-term standard is for a 1-hour averaging period, whereas for fine particulates (PM_{10}) it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants (e.g. temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road).

2.6 The AQS objective levels relevant to this assessment are set presented in **Appendix B**.

Air Quality (Wales) Regulations

2.7 Many of the objectives in the AQS were made statutory in Wales with the Air Quality (Wales) Regulations 2000[2] and the Air Quality (Wales) (Amendment) Regulations 2002 (the Regulations)[3] for the purpose of Local Air Quality Management (LAQM).

2.8 The Air Quality Standards (Amendment) Regulations 2016[4] amend the Air Quality Standards Regulations 2010 to implement the changes made by Directive (EU) 2015/1480 and came into force on the 31th December 2016. These regulations prescribe the 'relevant period' (referred to in Part I2V of the Environment Act 2021) that local authorities must consider in their review of the future quality of air within their area. The regulations also set out the air quality objectives to be achieved by the end of the 'relevant period'. The Air Quality Standards Regulations were further amended by the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[5] in January 2020 with regards to $PM_{2.5}$.

2.9 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[6] came into force on the 31st January 2023 and adopted into UK law a Target Value for $PM_{2.5}$.

Local Air Quality Management (LAQM)

2.10 Part IV of the Environment Act 2021 also requires local authorities to periodically review and assess the quality of air within their administrative area. The Reviews have to consider the present and future air quality and whether any air quality objectives prescribed in Regulations are being achieved or are likely to be achieved in the future.

2.11 Where any of the prescribed air quality objectives are not likely to be achieved the authority concerned must designate that part an Air Quality Management Area (AQMA).

2.12 For each AQMA, the local authority has a duty to draw up an Air Quality Action Plan (AQAP) setting out the measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the air quality objectives. Local authorities are not statutorily obliged to meet the objectives, but they must show that they are working towards them.

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[1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland – July 2007.

[2] The Air Quality (Wales) Regulations 2000 – Welsh Statutory Instrument 2000. No. 1940 (W.138)

[3] The Air Quality (Wales) (Amendment) Regulations 2002 – Welsh Statutory Instrument 2002. No 3182 (W. 298)

[4] The Air Quality Standards Regulations 2016 – Statutory Instrument 2016 No. 1184

[5] The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 – Statutory Instrument 2020 No 1313

[6] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 – Statutory Instrument 2023 No 96

2.13 The Department of Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities in their Review and Assessment work[7]. This guidance, referred to in this chapter as LAQM.TG(22), has been used where appropriate in the assessment.

National Planning Policy Framework

2.14 The National Planning Policy Framework (NPPF)[8] sets out the Government's planning policies for England and how these are expected to be applied. At the heart of the NPPF is a presumption in favour of sustainable development. It requires Local Plans to be consistent with the principles and policies set out in the NPPF with the objective of contributing to the achievement of sustainable development.

2.15 The NPPF states that the planning system has three overarching objectives in achieving sustainable development including a requirement to *'to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'*

2.16 Under Section 15: Conserving and Enhancing the Natural Environment, the NPPF (paragraph 174) requires that *'planning policies and decisions should contribute to and enhance the natural and local environment by …preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible help to improve local environmental conditions such as air and water quality'*

2.17 In dealing specifically with air quality the NPPF (paragraph 186) states that *'planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air*

[7] Department for Environment, Food and Rural Affairs (DEFRA), (2022): Part IV The Environment Act 2021 Local Air Quality Management Review and Assessment Technical Guidance LAQM.TG(22).

[8] Ministry of Housing, Communities and Local Government: *National Planning Policy Framework* (July 2021).

Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan'.

2.18 Paragraph 188 states that *'the focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively.'*

Planning Policy Wales

2.19 Planning Policy Wales (PPW)[9] sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars and policy clarification letters. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.

2.20 In dealing specifically with air quality PPW (paragraph 6.76) states 'In proposing new development, planning authorities and developers must:

- *'Address any implication arising as a result of its association with, or location within, air quality management areas or areas where there are sensitive receptors;*
- *Not create areas of poor air quality or inappropriate soundscape;*
- *Seek to incorporate measures which reduce overall exposure to air pollution.'*

2.21 Paragraph 6.715 states *'Potentially polluting development should be located in areas where there is low potential for public exposure, or where its impact can be minimised.'*

Neath Port Talbot County Borough Council Local Development Plan (2011-2026)

2.22 The Neath Port Talbot County Borough Council Local Development Plan[10] was adopted in January 2016 and sets out the council's approach for the borough for the period up to 2036. The following policies relevant to air pollution and the Proposed Development are contained within this document:

2.23 SP 16 Environmental Protection, which states

[9] Welsh Government. Planning Policy Wales 11th Edition (February 2021)

[10] Neath Port Talbot Council. (2016). Local Development Plan (2011-2026)

'*Air, water and ground quality and the environment generally will be protected and where feasible improved through the following measures:*

1. Ensuring that proposals have no significant adverse effects on water, ground or air quality and do not significantly increase pollution levels;

2. Giving preference to the development of brownfield sites over greenfield sites where appropriate and deliverable;

3. Ensuring that developments do not increase the number of people exposed to significant levels of pollution.'

2.24 Policy EN 8 Pollution and Land Stability, which states

'Proposals which would be likely to have an unacceptable adverse effect on health, biodiversity and/or local amenity or would expose people to unacceptable risk due to the following will not be permitted:

- *Air pollution;*
- *Noise pollution;*
- *Light pollution;*
- *Contamination;*
- *Land instability;*
- *Water (including groundwater) pollution.*

Proposals which would create new problems or exacerbate existing problems detailed above will not be acceptable unless mitigation measures are included to reduce the risk of harm to public health, biodiversity and/or local amenity to an acceptable level.'

2.25 Policy EN 9 Developments in the Central Port Talbot Area, which states

'*Developments in the central Port Talbot area that could result in breaches of air quality objectives during their construction phase, will be required to be undertaken in accordance with a Construction Management Plan submitted as part of the planning process and agreed by the Council*.'

Control of Dust and Particulates associated with Construction

2.26 Section 79 of the *Environmental Protection Act (1990*) provides the following definitions of statutory nuisance relevant to dust and particles:

- 'Any dust or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance', and
- 'any accumulation or deposit which is prejudicial to health or a nuisance'.

2.27 Following this, Section 80 states that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

2.28 In the context of the Proposed Development, the main potential for nuisance of this nature will arise during the construction phase – potential sources being the clearance, earthworks, construction and landscaping processes.

2.29 There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist – 'nuisance' is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred. However, research has been undertaken by a number of parties to determine community responses to such impacts and correlate these to dust deposition rates.

EPUK & IAQM Land Use Planning and Development Control

2.30 Environmental Protection UK (EPUK) & Institute of Air Quality Management (IAQM) published the Land Use Planning and Development Control Air Quality guidance in January 2017[11] to provide guidance on the assessment of air quality in relation to planning proposals and ensure that air quality is adequately considered within the planning control process.

2.31 The main focus of the guidance is to ensure all developments apply good practice principles to ensure emissions and exposure are kept to a minimum. It also sets out criteria for identifying when a more detailed assessment of operational impacts is required, guidance on undertaking detailed assessments and criteria for assigning the significance of any identified impacts.

2.32 This guidance has been used within this assessment.

[11] EPUK & IAQM. Land-use Planning and Development Control: Planning for Air Quality, January 2017

Assessment of Dust from Demolition and Construction

2.33 The IAQM published guidance in 2014 on the assessment of emissions from demolition and construction activities[12]. The guidance sets out an approach to identifying the risk of impacts occurring at nearby sensitive receptors from dust generated during the construction process and sets out recommended mitigation measures based on the identified risk.

2.34 This guidance has been used within this assessment.

[12] IAQM, Guidance on the assessment of dust from demolition and construction (version 1.1), February 2014.

3 METHODOLOGY

Scope of Assessment

3.1 The scope of the assessment has been determined in the following way:

- Review of air quality data for the area surrounding the Proposed Development and background pollutant maps;
- Review of the proposals; and
- Review of the traffic flow data.

3.2 During construction of the Proposed Development there is the potential for impacts to occur as a result of dust and PM_{10} emissions. Guidance provided by the IAQM recommends that an assessment is undertaken where there are human receptors within 350m of the site boundary or within 50m of the routes used by construction vehicles up to 500m from the site entrance; and where there are dust sensitive ecological receptors within 50m of the site boundary or within 50m of the routes used by construction vehicles up to 500m from the site entrance. Human receptors sensitive to dust soiling are located within 350m of the Site, but there are no dust sensitive ecological habitats in the vicinity of the Site. An assessment of the impacts of the construction of the Proposed Development on human receptors has therefore been included in the assessment. An assessment of the impacts on ecological receptors has not been considered further.

3.3 Guidance provided by the EPUK & IAQM provides threshold criteria for establishing when significant impacts on local air quality may occur and when a detailed assessment of potential impacts is required. At locations outside an AQMA, a change in light duty vehicles (LDV) of more than 500 per day and / or a change in heavy duty vehicles (HDV) of more than 100 per day is considered to result in potentially significant impacts on air quality. At locations inside an AQMA, a change in LDVs of more than 100 per day and / or a change in HDVs of more than 25 per day is considered to result in potentially significant impacts on air quality.

3.4 The Site is not located within or near an AQMA. Data provided by the transport consultants indicates that the operation of the Proposed Development will result in an increase exceeding the above threshold for locations outside an AQMA on Afan Way only. An assessment of the impact of road vehicles generated by the operation of the Proposed Development has therefore been included in the assessment.

3.5 It was not considered necessary to model proposed receptors, as the Proposed Development is for retail uses at the Site, which are not particularly sensitive to air quality. The long-term or annual mean objective levels would therefore not apply due to lack of relevant exposure. In consideration of monitoring data collected by NPTC and collation of UK-AIR background concentration data (as detailed below), it is considered very unlikely that the short term AQS would be breached. Air quality at the Site in terms of exposure has therefore not been considered any further within this assessment.

3.6 Details of the assessment methodology and the specific issues considered are provided below.

Construction Phase Methodology

Introduction

3.7 To assess the potential impacts associated with dust and PM_{10} releases during the construction phase and to determine any necessary mitigation measures, an assessment based on the latest guidance from the IAQM has been undertaken.

3.8 This approach divides construction activities into the following four categories:

- demolition;
- earthworks;
- construction; and
- trackout (the transport of dust and dirt from the construction site onto the public road network).

3.9 The assessment methodology then considers two separate dust effects:

- annoyance due to dust soiling; and
- the risk of health effects due to a significant increase in exposure to PM_{10}.

3.10 The assessment of the risk of dust effects is determined by:

- the scale and nature of the works, which determine the risk of dust arising; and
- the proximity of sensitive receptors.

3.11 Risks are described in terms of there being a low, medium or high risk of dust effects for each of the four separate potential activities. This assessment is based on both IAQM criteria and professional judgement.

3.12 Mitigation measures are identified where necessary and significance of dust effects determined following such mitigation. The significance of the dust effects is based on professional judgement, taking into account the sensitivity of the surrounding area and the existing air quality.

Dust Emission Magnitude

3.13 The magnitude of the dust impacts for each source is classified as Small, Medium or Large depending on the scale of the proposed works. Table 3.1 summarises the IAQM criteria that may be used to determine the magnitude of the dust emission. These criteria are used in combination with site specific information and professional judgement.

Table 3.1: Dust Emission Magnitude Criteria

Source	Large	Medium	Small
Demolition	• Total building volume >50,000m^3 • Potentially dusty material (e.g. concrete) • Onsite crushing and screening • Demolition activities >20m above ground level.	• Total building volume 20,000 - 50,000m^3 • Potentially dusty material • Demolition activities 10 - 20m above ground level.	• Total building volume <20,000m^3 • Construction material with low potential for dust release • Demolition activities <10m above ground level • Demolition during wetter months
Earthworks	• Total site area >10,000m^2 • Potentially dusty soil type (e.g. clay) • >10 heavy earth moving vehicles active at any one time • Formation of bunds >8m in height • Total material moved >100,000 tonnes	• Total site area 2,500 - 10,000m^2 • Moderately dusty soil type (e.g. silt) • 5 - 10 heavy earth moving vehicles active at any one time • Formation of bunds 4 - 8m in height • Total material moved 20,000 - 100,000 tonnes	• Total site area <2,500m^2 • Soil type with large grain size (e.g. sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <4m in height • Total material moved <20,000 tonnes • Earthworks during wetter months
Construction	• Total building volume >100,000m^3 • On site concrete batching • Sandblasting	• Total building volume 25,000 - 100,000m^3 • Potentially dusty construction material (e.g. concrete) • On site concrete batching	• Total building volume <25,000m^3 • Material with low potential for dust release (e.g. metal cladding or timber)
Trackout	• >50 HGV movements in any one day (a) • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100m	• 10 - 50 HGV movements in any one day (a) • Moderately dusty surface material (e.g. silt) • Unpaved road length 50 - 100m	• <10 HGV movements in any one day (a) • Surface material with low potential for dust release • Unpaved road length <50m
(a) HGV movements refer to outward trips (leaving the site) by vehicles of over 3.5 tonnes.			

Receptor Sensitivity

3.14 Factors defining the sensitivity of a receptor are presented in Table 3.2.

Table 3.2: Factors Defining the Sensitivity of a Receptor

Sensitivity	Human (health)	Human (dust soiling)	Ecological
High	• Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM_{10} (a) • Examples include residential dwellings, hospitals, schools and residential care homes.	• Regular exposure • High level of amenity expected. • Appearance, aesthetics or value of the property would be affected by dust soiling. • Examples include residential dwellings, museums, medium and long-term car parks and car showrooms.	• Nationally or Internationally designated site with dust sensitive features (b) • Locations with vascular species (c)
Medium	• Locations where workers are exposed over a time period relevant to the air quality objectives for PM_{10} (a) • Examples include office and shop workers (d)	• Short-term exposure • Moderate level of amenity expected • Possible diminished appearance or aesthetics of property due to dust soiling • Examples include parks and places of work	• Nationally designated site with dust sensitive features (b) • Nationally designated site with a particularly important plant species where dust sensitivity is unknown
Low	• Transient human exposure • Examples include public footpaths, playing fields, parks and shopping streets	• Transient exposure • Enjoyment of amenity not expected. • Appearance and aesthetics of property unaffected • Examples include playing fields, farmland (e), footpaths, short-term car parks and roads	• Locally designated site with dust sensitive features (b)

(a) 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.

(b) Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete).

(c) Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.

(d) Does not include workers exposure to PM_{10} as protection is covered by Health and Safety at Work legislation.

(e) Except commercially sensitive horticulture.

3.15 The sensitivity of a receptor will also depend on a number of additional factors including any history of dust generating activities in the area, likely cumulative dust impacts from nearby construction sites, any pre-existing screening such as trees or buildings and the likely duration of the impacts. In addition, the influence of the prevailing wind direction and local topography may be of relevance when determining the sensitivity of a receptor.

Area Sensitivity

3.16 The sensitivity of the area to dust soiling and health impacts is dependent on the number of receptors within each sensitivity class and their distance from the source. In addition, human health impacts are dependent on the existing PM_{10} concentrations in the area. Tables 3.3 and 3.4 summarise the criteria for determining the overall sensitivity of the area to dust soiling and health impacts respectively.

Table 3.3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the source (a)			
		<20m	<50m	<100m	<350m
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

(a) For trackout, the distance is measured from the side of roads used by construction traffic. Beyond 50m, the impact is negligible.

Table 3.4: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} ($\mu g/m^3$)	Number of Receptors	Distance from the source (a)				
			<20m	<50m	<100m	<200m	<350m
High	> 32	> 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32	> 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28	> 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	< 24	> 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	>32	> 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28-32	> 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	<28	-	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

(a) For trackout, the distance is measured from the side of roads used by construction traffic. Beyond 50m, the impact is negligible.

3.17 For each dust emission source (demolition, construction, earthworks and trackout), the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust impacts.

Risk of Dust Impacts

3.18 The risk of dust impacts prior to mitigation for each emission source is presented in Tables 3.5, 3.6 and 3.7.

Table 3.5: Risk of Dust Impacts – Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 3.6: Risk of Dust Impacts – Earthworks and Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 3.7: Risk of Dust Impacts - Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Mitigation and Significance

3.19 The IAQM guidance provides a range of mitigation measures which are dependent on the level of dust risk attributed to the Proposed Development. Site specific mitigation measures are also included where appropriate.

3.20 The IAQM assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity following the application of appropriate mitigation measures. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effects will normally be negligible.

Construction Traffic

3.21 Construction traffic will contribute to existing traffic levels on the surrounding road network. The greatest potential for impacts on air quality from traffic associated with this phase of the Proposed Development will be in the areas immediately adjacent to the principal means of access for construction traffic.

3.22 Based on the size and location of the Proposed Development, construction related traffic flows are not predicted to be significant in terms of total emissions or construction duration.

Operational Phase Methodology

3.23 Air quality at the Proposed Development has been predicted using the ADMS Roads dispersion model (Version 5.0.1.3). This is a commercially available dispersion model and has been widely validated for this type of assessment and used extensively in the Air Quality Review and Assessment process.

3.24 The model uses detailed information regarding traffic flows on the local road network and local meteorological conditions to predict pollution concentrations at specific locations selected by the user. Meteorological data from Mumbles Head for the year 2019 has been used for the assessment.

3.25 The model has been used to predict road specific concentrations of oxides of nitrogen (NO_x) and Particulate Matter (PM_{10} and $PM_{2.5}$) at selected receptors. The predicted concentrations of NO_x have been converted to NO_2 using the NO_x to NO_2 calculator (August 2020) available on the Defra air quality website[13].

3.26 Traffic data has been provided by the transport consultants for the project. A summary of the traffic data used in the assessment can be found in **Appendix C**. The data includes details of annual average daily traffic flows (AADT), vehicle speeds and percentage Heavy Duty Vehicles (HDV) for the assessment years considered. Low traffic speeds have been assigned to appropriate road links to account for congestion and queuing vehicles.

3.27 The following scenarios have been included in the assessment:

- 2019 – baseline traffic (for verification purposes);
- 2024 – baseline traffic (hereafter referred to as 'without development' scenario); and
- 2024 – baseline and development traffic (hereafter referred to as 'with development' scenario).

3.28 The emission factors released by Defra in November 2021, provided in the emissions factor toolkit EFT2021 v11.0 have been used to predict traffic related emissions in 2019 (for verification purposes) and 2024.

3.29 To predict local air quality, traffic emissions predicted by the model must be added to local background concentrations. Background concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been taken from the 2018 Defra background maps. The maps provide an estimate of background

[13] http://uk-air.defra.gov.uk

concentrations between 2018 and 2030. The data used for the modelling assessment are set out in Table 4.3.

3.30 Background concentrations for 2019 have been used to predict concentrations in 2024 assuming no change in future years. This is considered to represent a worst-case prediction of future concentrations.

3.31 To determine the performance of the model at a local level, a comparison of modelled results with the results of monitoring carried out within the study area was undertaken. This process aims to minimise modelling uncertainty and systematic error by correcting the modelled results by an adjustment factor to gain greater confidence in the final results. This process was undertaken using the methodology outlined in Chapter 7, Section 4 of LAQM.TG(22).

3.32 A verification factor of 3.99 was determined which indicates that the model is under-predicting in this area. This factor was applied to the modelled road-NO_x concentrations prior to conversion to annual mean NO_2 concentrations using the NO_x to NO_2 calculator. Further details of the determination of the verification factor are provided in **Appendix D**.

3.33 Local roadside monitoring data was not available for concentrations of PM_{10} and $PM_{2.5}$, the modelled pollutant road-contributions for PM_{10} and $PM_{2.5}$ were therefore adjusted using the verification factor obtained for NO_x as recommended in the guidance provided in LAQM.TG(22).

3.34 A quantitative assessment of air quality in the vicinity of the Proposed Development has been completed against the relevant Air Quality Assessment Levels (AQALs) set out in **Appendix B** for NO_2, PM_{10} and $PM_{2.5}$.

Sensitive Receptors

3.35 LAQM.TG(22) describes in detail typical locations where consideration should be given to pollutants defined in the Regulations. Generally, the guidance suggests that all locations '*where members of the public are regularly present*' should be considered. At such locations, members of the public will be exposed to pollution over the time that they are present, and the most suitable averaging period of the pollutant needs to be used for assessment purposes.

3.36 For instance, on a footpath, where exposure will be transient (for the duration of passage along that path) comparison with short-term standard (i.e. 15-minute mean or 1-hour mean) may be relevant. For private dwellings, however; where exposure may be for longer periods, comparison with long-term (such as 24-hour mean or annual mean) standards may be most appropriate. In general terms, concentrations associated with long-term standards are lower

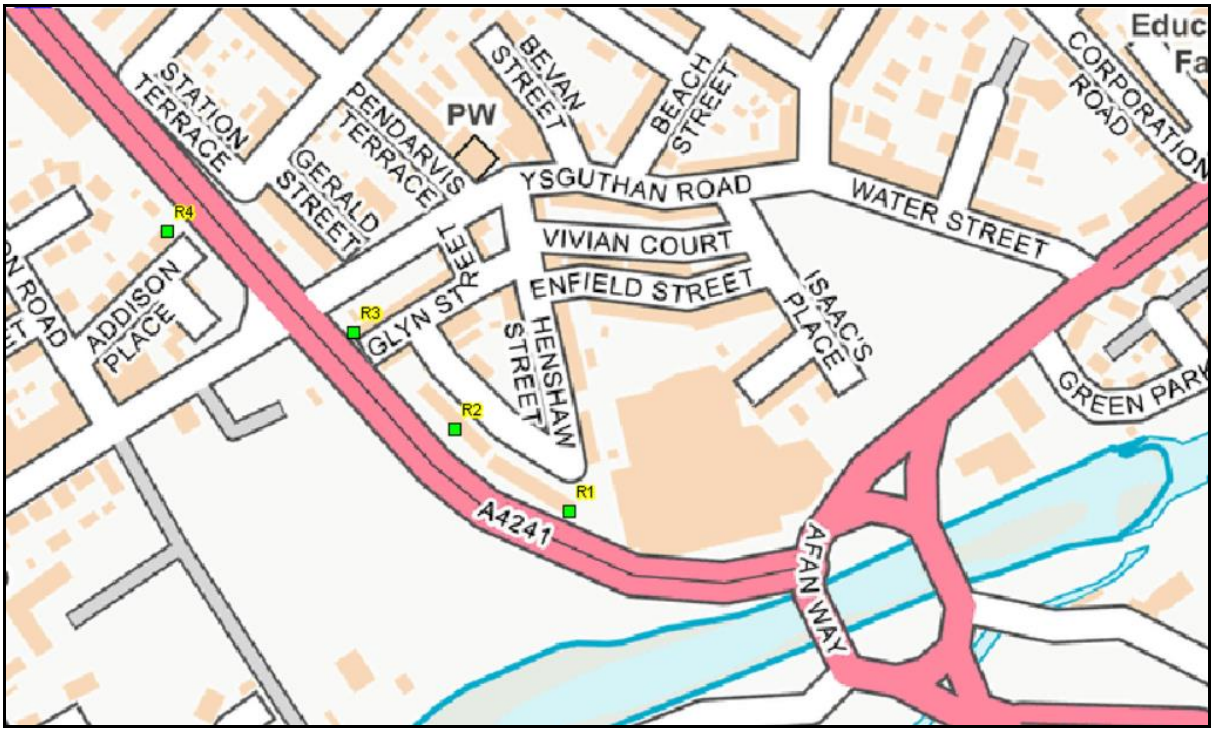
than short-term standards owing to the chronic health effects associated with exposure to low level pollution for longer periods of time.

3.37 To assess the impact of traffic generated by the Proposed Development, pollutant concentrations have been predicted at four existing sensitive residential receptors close to the road affected by traffic generated by the Proposed Development. Details of these sensitive receptors are presented in Table 3.8 and the locations are illustrated in Figure 3.1.

Table 3.8: Location of Sensitive Receptors

ID	Receptor	Type	Easting	Northing
R1	22 Glenavon Street	Residential	275718.6	189717.4
R2	6 Glenavon Street	Residential	275654.2	189763.2
R3	23 Glyn Street	Residential	275597.6	189817.6
R4	2 Addison Place	Residential	275493.4	189874.6

Figure 3.1: Location of Receptors Considered within ADMS Model



Significance Criteria

3.38 The EPUK & IAQM planning guidance provides criteria for determining the significance of a development. The EPUK & IAQM guidance recommends that the impact at individual receptors is described by expressing the magnitude of incremental change in pollution concentration as a

proportion of the relevant assessment level and examining this change in the context of the new total concentration and its relationship with the assessment criterion as summarised in Table 3.9.

Table 3.9: Impact Descriptors for Individual Receptors.

Long Term Average Concentration at Receptor in Assessment Year	% Change in concentration relative to AQAL (a)			
	1	2-5	5-10	>10
75% or less of AQAL	Negligible	Negligible	Slight adverse	Moderate adverse
76-94% of AQAL	Negligible	Slight adverse	Moderate adverse	Moderate adverse
95-102% of AQAL	Slight adverse	Moderate adverse	Moderate adverse	Substantial adverse
103-109% of AQAL	Moderate adverse	Moderate adverse	Substantial adverse	Substantial adverse
110% or more of AQAL	Moderate adverse	Substantial adverse	Substantial adverse	Substantial adverse
(a) A change in concentration of less than 0.5% of the AQAL is considered insignificant, however changes between 0.5% and 1% are rounded up to 1%.				

3.39 The EPUK & IAQM guidance notes that the criteria in Table 3.9 should be used to describe impacts at individual receptors and should be considered as a starting point to make a judgement on significance of effects, as other influences may need to be accounted for. The EPUK & IAQM guidance states that the assessment of overall significance should be based on professional judgement, taking into account several factors, including:

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

4 BASELINE CONDITIONS

Neath Port Talbot Council Review and Assessment of Air Quality

4.1 NPTC has carried out detailed assessments of air quality in the area and as a result has declared one AQMA within the district due to potential exceedences of the AQS objective for 24-hour mean PM_{10} concentrations; this AQMA is located approximately 0.8km to the southeast of the Site.

Automatic Local Monitoring Data

4.2 NPTC currently operates six automatic monitoring sites within the district, five of which are industrial monitors and one is a roadside monitor. None are close to the Site, the closest is Talbot Little Warren which is an industrial monitor approximately 1.1km to the southwest. Data from these monitoring sites is presented in Table 4.1 below.

Table 4.1: Pollutant Concentrations recorded at the Continuous Automatic Monitors

Pollutant	Statistic	Year				
		2017	2018	2019	2020	2021
Port Talbot Margam Fire Station AURN (Industrial)						
NO_2	Annual Mean	16.0	15.0	15.0	12.0	13.0
	Number of 1-Hour means > 200 µg/m^3	0	0	0	0	0
PM_{10}	Annual Mean (µg/m^3)	23	23	21	21	25
	Number of 24-hour means > 50 µg/m^3	17	11	12	11	33
$PM_{2.5}$	Annual Mean (µg/m^3)	10	11	11	9	9
Dyffryn School (Industrial)						
PM_{10}	Annual Mean (µg/m^3)	21	-	22	23	25
	Number of 24-hour means > 50 µg/m^3	2	-	2	0	0
Twll-yn-y Wal Park (Industrial)						
PM_{10}	Annual Mean (µg/m^3)	21	21	21	20	20
	Number of 24-hour means > 50 µg/m^3	3	9	10	7	0
Talbot Little Warren (Industrial)						
PM_{10}	Annual Mean (µg/m^3)	21	21	20	21	18
	Number of 24-hour means > 50 µg/m^3	16	9	9	15	7
Prince Street (Industrial)						
PM_{10}	Annual Mean (µg/m^3)	25	23	20	24	20
	Number of 24-hour means > 50 µg/m^3	18	12	8	16	3
$PM_{2.5}$	Annual Mean (µg/m^3)	10	9	9	9	9
Victoria Gardens (Roadside)						
NO_2	Annual Mean	39.0	34.0	32.0	27.0	26.0
	Number of 1-Hour means > 200 µg/m^3	0	0	0	0	0
Data obtained from NPTC Air Quality Annual Status Report 2022						

4.3 Exceedences of the AQS objective for annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations have not been experienced at the monitors in the years of monitoring presented.

4.4 Exceedences of the hourly objective have not been recorded at the sites, therefore the objective was met in all five monitoring years.

4.5 Exceedences of the 24-hour objective have been recorded at the monitoring stations, however the objective allows for 35 exceedences of the 50 µg/m^3 limit in any given year therefore the objective was met in all five monitoring years.

4.6 Based on the data recorded at these sites, pollutant concentrations are expected to meet the relevant objectives at the Site.

Non-Automatic Monitoring

4.7 NO_2 diffusion tube monitoring is also carried out in the borough. One of these tubes is located in close proximity to the Site. Data from the closest monitoring site to the Proposed Development is presented in Table 4.2 below.

Table 4.2: NO_2 Concentrations recorded at the nearest Diffusion Tube Monitor (µg/m^3)

Monitoring Site	Type	Distance to Kerb	2017	2018	2019	2020	2021
25 – Water St. Port Talbot	Roadside	2	26.4	24.1	27.7	21.5	26.6
Data obtained from NPTC Air Quality Annual Status Report 2022							

4.8 At the diffusion tube site, NO_2 concentrations were below the annual mean objective in the years of monitoring presented.

4.9 Diffusion tubes cannot monitor short-term NO_2 concentrations, however, research has concluded[14] that exceedances of the 1-hour mean objective are generally unlikely to occur where annual mean concentrations do not exceed 60 µg/m^3. Annual mean NO_2 concentrations were below 60 µg/m^3 at the monitoring site therefore it is expected that the 1-hour objective is being met at this location and at the Site.

4.10 Based on the data recorded at this site, NO_2 concentrations are expected to meet the annual mean and 1-hour mean objectives at the Site.

Defra Background Maps

4.11 Additional information on background concentrations in the vicinity of the Proposed Development have been obtained from the Defra background pollutant maps. The pollutant concentrations from the grid squares representing the assessment area have been extracted from

[14] D. Laxen and B Marner (2003) Analysis of the relationship between 1-hour and annual mean nitrogen dioxide at UK roadside and kerbside monitoring sites.

the maps which include the modelled receptors and road links included in the modelling assessment.

4.12 The 2018 Defra background maps, which provide estimated background concentrations between 2018 and 2030, have been used to obtain concentrations for 2019. The data is set out in Table 4.3.

Table 4.3: Estimated Annual Mean Background Concentrations from Defra Maps (µg/m^3)

Pollutant	276500, 189500	275500, 189500	Air Quality Assessment Level
NO_2	15.1	9.8	40
PM_{10}	13.3	12.1	40
$PM_{2.5}$	8.1	7.8	20

4.13 The data presented in Table 4.3 shows background concentrations of all three pollutants to be well below the relevant Air Quality Assessment Levels.

5 ASSESSMENT OF IMPACT

Construction Phase

Area Sensitivity

5.1 No demolition is proposed at the Site. An assessment of dust effects associated with demolition has therefore not been included within this assessment.

5.2 The assessment of dust impacts of earthworks, construction works and trackout is dependent on the proximity of the most sensitive receptors to the Site boundary. A summary of the receptor and area sensitivity to health and dust soiling impacts is presented in Table 5.1.

Table 5.1: Sensitivity of Receptors and the Local Area to Dust and PM_{10} Impacts

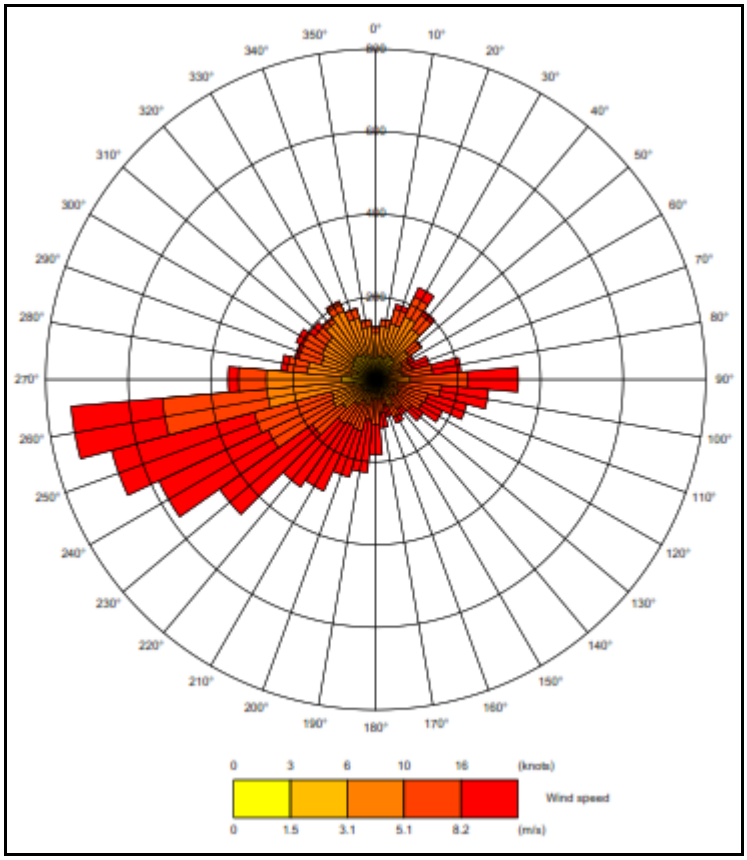
Receptor	Distance from Site Boundary (m)	Approx. Number of Receptors	Sensitivity to Health Impacts (a)		Sensitivity to Dust Soiling Impacts	
			Receptor	Area	Receptor	Area
Residential dwellings	<20 m	10-100	High	Low	High	High
Overall Sensitivity of the Area			**Low**		**High**	
(a) Estimated background PM_{10} concentration is 13.3 µg/m^3.						

5.3 It is considered that construction traffic would access the Site via Water Street, along which there are a number of residential properties within 20m of the roadside. The sensitivity of the area to impacts from trackout is therefore considered to be high for dust soiling and low for human health effects due to particulate matter.

5.4 The precise behaviour of the dust, its residence time in the atmosphere, and the distance it may travel before being deposited will depend upon a number of 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.

5.5 A wind rose from Mumbles Head is provided in Figure 5.1, which shows that the prevailing wind is from the southwest, therefore receptors to the northeast of the Proposed Development are the most likely to experience dust impacts from the Proposed Development. Residential dwellings are located to the northeast of the Proposed Development.

Figure 5.1: Wind Rose for Mumbles Head Meteorological Station (2019)



Dust Emission Magnitude

5.6 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling of the site and landscaping. Based on the size of the Site, the magnitude of the dust emission for the earthworks phase is considered to be *large*.

5.7 Dust emissions during construction will depend on the scale of the works, method of construction, construction materials and duration of build. Based on the overall size of the Proposed Development, the dust emission magnitude is considered to be *small*.

5.8 Factors influencing the degree of trackout and associated magnitude of effect include vehicle size, vehicle speed, vehicle numbers, geology and duration. The number of HGV movements (leaving the Site) is likely to be less than 25 per day, therefore dust emission magnitude due to trackout is considered to be *medium.*

Dust Risk Effects

5.9 A summary of the potential risk of dust impacts, based on the low overall sensitivity of the area to human health impacts and high overall sensitivity to dust soiling, is presented in Table 5.2.

Table 5.2: Risk of Dust Impacts Prior to Mitigation

Source	Impact Magnitude	Human Health Risk	Dust Soiling Risk
Earthworks	Large	Low	High
Construction	Small	Negligible	Low
Trackout	Medium	Low	Medium

Operational Phase

NO_2 Concentrations

5.10 Annual mean NO_2 concentrations predicted at the selected receptor locations are set out in Table 5.3. The concentrations include the estimated background NO_2 concentration indicated in Table 4.3.

Table 5.3: Predicted Annual Mean Nitrogen Dioxide Concentrations at Selected Receptors (µg/m³)

Receptor Number	2024 Without Development	2024 With Development	Change as a result of Development (as % of the AQAL)	Significance of Effect
R1	12.3	12.5	0.6	Negligible
R2	12.1	12.3	0.5	Negligible
R3	13.1	13.5	0.8	Negligible
R4	11.4	11.6	0.4	Negligible

5.11 The predicted annual mean NO_2 concentrations are below the 40µg/m³ objective level at all selected receptor locations under both scenarios.

5.12 In accordance with the EPUK & IAQM significance criteria, the impact on annual mean NO_2 concentrations at all receptors as a result of traffic emissions from the Proposed Development is predicted to be *negligible*.

5.13 As the predicted annual mean NO_2 concentrations are all below 60 µg/m³, it is considered unlikely that the 1-hour objective will be exceeded at any of the selected receptors. The impact of the Proposed Development on hourly mean NO_2 concentrations is therefore also considered to be *negligible*.

PM_{10} Concentrations

5.14 Predicted annual mean PM_{10} concentrations at the selected receptor locations are presented in Table 5.4. The concentrations include the estimated background PM_{10} concentration indicated in Table 4.3.

Table 5.4: Predicted Annual Mean PM_{10} Concentrations at Selected Receptors (µg/m³)

Receptor Number	2024 Without Development	2024 With Development	Change as a result of Development (as % of the AQAL)	Significance of Effect
R1	12.8	12.9	0.2	Negligible
R2	12.7	12.8	0.2	Negligible
R3	13.0	13.0	0.2	Negligible
R4	12.6	12.6	0.1	Negligible

5.15 The predicted annual mean PM_{10} concentrations are well below (less than 75% of) the 40µg/m³ objective level at all the selected receptor locations under both scenarios.

5.16 In accordance with the EPUK & IAQM significance criteria, the impact on annual mean PM_{10} concentrations at all receptors as a result of traffic emissions from the Proposed Development is predicted to be *negligible*.

5.17 LAQM.TG(22) provides a relationship between predicted annual mean concentrations and the likely number of exceedances of the short-term (24-hour mean) PM_{10} objective of 50µg/m³ (N), where:

$$N = -18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean}).$$

5.18 The objective allows 35 exceedances per year, which is equivalent to an annual mean of 32µg/m³.

5.19 The number of predicted exceedances at all receptors under all scenarios is less than one day with a change of less than one day with the operational Proposed Development. The impact of the Proposed Development on the 24-hour objective would also be *negligible*.

$PM_{2.5}$ Concentrations

5.20 Predicted annual mean $PM_{2.5}$ concentrations at the selected receptor locations are presented in Table 5.5. The concentrations include the estimated background $PM_{2.5}$ concentrations indicated in Table 4.3.

Table 5.5: Predicted Annual Mean $PM_{2.5}$ Concentrations at Selected Receptors (µg/m^3)

Receptor Number	2024 Without Development	2024 With Development	Change as a result of Development (as % of the AQAL)	Significance of Effect
R1	8.2	8.2	0.2	Negligible
R2	8.1	8.2	0.2	Negligible
R3	8.3	8.3	0.2	Negligible
R4	8.1	8.1	0.1	Negligible

5.21 The predicted annual mean $PM_{2.5}$ concentrations are well below (less than 75% of) the 20µg/m^3 standard at all the selected receptor locations under both scenarios.

5.22 In accordance with the EPUK & IAQM significance criteria, the significance of the impact of the operation of the Proposed Development on annual mean $PM_{2.5}$ concentrations is *negligible*.

6 MITIGATION

Construction Phase

6.2 The control of dust emissions from construction site activities relies upon management provision and mitigation techniques to reduce emissions of dust and limit dispersion. Where dust emission controls have been used effectively, construction operations have been successfully undertaken without impacts to nearby properties.

6.3 Overall the Proposed Development is considered to be a high risk of dust impacts and low risk to human health from particulate matter concentrations at nearby receptors during the construction phase. Appropriate mitigation measures for the Proposed Development have been identified following the IAQM guidance and based on the risk effects presented in Table 5.2. It is recommended that the 'highly recommended' measures set out in the IAQM guidance and reproduced in **Appendix E** are incorporated into a Dust Management Plan (DMP) and approved by NPTC prior to commencement of any work on the Site.

6.4 In addition to the ‘recommended’ measures, the IAQM guidance also sets out a number of ‘desirable’ measures which should also be considered. These are also set out in **Appendix E**.

6.5 Following implementation of the ‘highly recommended’ measures outlined in the IAQM guidance and reproduced in **Appendix E**, the impact of emissions during construction of the Proposed Development would be negligible.

Operational Phase

6.6 The detailed dispersion modelling indicates that the impact of the operation of the Proposed Development on local pollutant concentrations is negligible and that the concentrations of relevant pollutants (NO_2, PM_{10} and $PM_{2.5}$) at nearby sensitive receptors will meet the relevant air quality assessment levels. Therefore, it is considered that no mitigation measures will be required during the operational phase.

7 CONCLUSIONS

7.1 An air quality impact assessment has been carried out to assess both construction and operational impacts of the Proposed Development.

7.2 An assessment of the potential impacts during the construction phase has been carried out in accordance with the latest Institute of Air Quality Management Guidance. This has shown that for the Proposed Development, limited releases of dust and particulate matter are likely to be generated from on-site activities. However, through good site practice and the implementation of suitable mitigation measures, the impact of dust and particulate matter releases may be effectively mitigated and the resultant impacts are considered to be negligible.

7.3 ADMS Roads dispersion modelling has been carried out to assess the impact of the operation of the Proposed Development on local pollutant concentrations. The results indicate that predicted concentrations of relevant pollutants (NO_2, PM_{10} and $PM_{2.5}$) concentrations are below the relevant air quality assessment levels at nearby sensitive receptors.

7.4 In accordance with the EPUK & IAQM significance criteria, the overall impact of the operation of the Proposed Development on NO_2, PM_{10} and $PM_{2.5}$ concentrations is considered to be negligible.

7.5 It is concluded that air quality does not pose a constraint to the Proposed Development, either during construction or once operational.

APPENDIX A - AIR QUALITY TERMINOLOGY

Term	Definition
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year. Usually this is for a calendar year, but some species are reported for the period April to March, known as a pollution year. This period avoids splitting winter season between 2 years, which is useful for pollutants that have higher concentrations during the winter months.
AQMA	Air Quality Management Area.
DEFRA	Department for Environment, Food and Rural Affairs.
Exceedance	A period of time where the concentrations of a pollutant is greater than, or equal to, the appropriate air quality standard.
Fugitive emissions	Emissions arising from the passage of vehicles that do not arise from the exhaust system.
LAQM	Local Air Quality Management.
NO	Nitrogen monoxide, a.k.a. nitric oxide.
NO_2	Nitrogen dioxide.
NO_x	Nitrogen oxides.
O_3	Ozone.
Percentile	The percentage of results below a given value.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
ppb parts per billion	The concentration of a pollutant in the air in terms of volume ratio. A concentration of 1 ppb means that for every billion (10^9) units of air, there is one unit of pollutant present.
ppm parts per million	The concentration of a pollutant in the air in terms of volume ratio. A concentration of 1 ppm means that for every billion (10^6) units of air, there is one unit of pollutant present.
Ratification (Monitoring)	Involves a critical review of all information relating to a data set, in order to amend or reject the data. When the data have been ratified they represent the final data to be used (see also validation).
µg/m^3 micrograms per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1ug/m3 means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.
UKAS	United Kingdom Accreditation Service.
Uncertainty	A measure, associated with the result of a measurement, which characterizes the range of values within which the true value is expected to lie. Uncertainty is usually expressed as the range within which the true value is expected to lie with a 95% probability, where standard statistical and other procedures have been used to evaluate this figure. Uncertainty is more clearly defined than the closely related parameter 'accuracy', and has replaced it on recent European legislation.
USA	Updating and Screening Assessment.
Validation (modelling)	Refers to the general comparison of modelled results against monitoring data carried out by model developers.
Validation (monitoring)	Screening monitoring data by visual examination to check for spurious and unusual measurements (see also ratification).
Verification (modelling)	Comparison of modelled results versus any local monitoring data at relevant locations.

APPENDIX B - AIR QUALITY ASSESSMENT LEVELS

Table B1: Air Quality Assessment Levels

Pollutant	Objective Level ($\mu g/m^3$)	Averaging Period	No. of Permitted Exceedances	Notes
NO_2	200 (a)	1-Hour	18 per annum (99.8th percentile)	
	40 (a)	Annual	-	
PM_{10}	50 (a)	24-Hour	35 per annum (90.4th percentile)	
	40 (a)	Annual	-	
$PM_{2.5}$	20 (b)	Annual		
	12 (b)	Annual		Interim Target to be achieved by end Jan 2028
	10 (c)	Annual		Target Level to be achieved by end Dec 2040

(a) Air Quality Standards Regulations (2016) and amendments

(b) Environmental Improvement Plan 2023

(c) The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023

APPENDIX C - SUMMARY OF TRAFFIC DATA

Traffic data utilised for the air quality assessment (AADT)

Road Link	Speed (kph)		2019 Base and Verification		2024 Without Development		2024 With Development	
	Freeflow	Congestion/ Junction	AADT	% HGV	AADT	% HGV	AADT	% HGV
Water Street	48	30	18059	1.9	-	-	-	-
Afan Way	48	30	11786	2.0	12238	2.0	13388	2.0

APPENDIX D – VERIFICATION AND ADJUSTMENT OF MODELLED CONCENTRATIONS

Most nitrogen dioxide (NO_2) is produced in the atmosphere by reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of primary pollutant emissions. Verification of concentrations predicted by the ADMS model has followed the methodology presented in LAQM.TG(22).

The model has been run to predict annual mean road-NO_x concentrations at one nearby monitoring site.

The model output of road-NOx (i.e. the component of total NO_x coming from road traffic) has been compared to the 'measured' road-NO_x (Table D1). The 'measured' road NO_x has been calculated from the measured NO_2 concentrations by using the Defra NO_x to NO_2 calculator available on the UK-AIR website.

Table D1: Comparison of Modelled and Monitored NOx concentrations

Monitoring Location	Total Monitored NO_2	Background NO_2	Monitored Road NOx	Modelled Road NOx	Ratio
25	27.7	15.1	24.2	6.1	3.99

The results in Table D1 indicate that the ADMS model under-predicted the road NO_x concentrations at the selected monitoring site. An adjustment factor was therefore determined as the ratio between the measured road-NO_x contribution and the modelled road-NO_x contribution (3.99) forced through zero. This factor has then been applied to the modelled road-NO_x concentration for each location to provide an adjusted modelled road-NO_x concentration.

The annual mean road-NO_2 concentration was determined using the Defra NO_x:NO_2 spread sheet calculation tool and added to the background NO_2 concentration to produce a total adjusted NO_2 concentration.

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

There was insufficient roadside monitoring data available against which the modelling could be verified. Consequently, the road-PM_{10} and road-$PM_{2.5}$ contributions were adjusted using the factor obtained for NO_x concentrations, consistent with guidance provided in LAQM.TG(22).

APPENDIX E - CONSTRUCTION MITIGATION MEASURES

It is recommended that the 'highly recommended' measures set out below are incorporated into a DMP and approved by NPTC prior to commencement of any work on site:

- develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- display the name and contact details of the person accountable for air quality and dust issues on the site boundary (i.e. the environment manager/engineer or site manager);
- display the head or regional office contact information on the site boundary;
- record all dust and air quality complaints, identify cause, take appropriate measures to reduce emissions in a timely manner and record the measures taken;
- make the complaints log available to the local authority when asked;
- record any exceptional incidents that cause dust and/or air emissions, either on- or off- site and the action taken to resolve the situation in the log book;
- hold regular liaison meetings with other high risk construction sites within 500m of the site boundary to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport / deliveries which might be using the same strategic road network routes;
- undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of the site boundary, with cleaning to be provided if necessary;
- carry out regular site inspections to monitor compliance with the DMP, record inspection results and make inspection log available to NPTC when asked;
- increase frequency of site inspection by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged periods of dry or windy conditions;
- agree dust deposition, dust flux or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site.
- plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles;
- fully enclose site or specific operations where there is a high potential for dust production and the activities are being undertaken for an extensive period;
- avoid site runoff of water or mud;
- keep site fencing, barriers and scaffolding clean using wet methods;

- remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If being re-used on site, cover as detailed below;
- cover, seed or fence stockpiles to prevent wind whipping;
- ensure all vehicles switch off engines when stationary - no idling vehicles;
- avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable;
- impose and signpost a maximum speed limit of 15mph on surfaces and 10mph on un-surfaces haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate);
- produce a construction logistic plan to manage the sustainable delivery of goods and materials;
- implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing);
- only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction e.g. suitable local exhaust ventilation systems;
- ensure an adequate water supply on site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- use enclosed chutes and conveyors and covered skips;
- minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate;
- ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods;
- avoid bonfires and burning of waste materials;
- re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable;
- only remove the cover in small areas during work and not all at once;
- avoid scabbing (roughening of concrete surfaces) if possible;
- ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery;
- use water-assisted dust sweepers on the access and local roads, to remove, as necessary, any material tracked out of the site;

- avoid dry sweeping of large areas;
- ensure vehicles entering and leaving the site are covered to prevent the escape of materials during transport;
- inspect on-site haul routes for integrity and instigate necessary repairs to the surfaces as soon as reasonably practicable;
- record all inspections of haul routes and any subsequent action in a site log book;
- install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;
- implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud);
- ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit; and
- access gates to be located at least 10 m from receptors where possible.

The IAQM guidance also includes the following ‘desirable’ measure which should also be considered:

- for smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.