H2Teesside Project

Environmental Statement

Volume III – Appendices

Appendix 8A: Air Quality - Construction Assessment

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The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)

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8A.0 AIR QUALITY – CONSTRUCTION ASSESSMENT

8A.1 Introduction

8A.1.1 This Technical Appendix supports Chapter 8: Air Quality (ES Volume I, EN070009/APP/6.2). For more details about the Proposed Development refer to Chapter 4: Proposed Development (ES Volume I, EN070009/APP/6.2).

8A.1.2 Emissions to air from the Proposed Development have the potential to adversely affect human health and sensitive ecosystems if not appropriately controlled. This technical appendix identifies and proposes measures to address the potential impacts and effects of the Proposed Development on air quality during construction and decommissioning. Emissions associated with the construction phase could give rise to potential localised air quality effects from traffic and dust generation, which have the potential to affect human health and sensitive ecosystems if not appropriately managed.

8A.2 Scope

Construction Phase Emissions

8A.2.1 The assessment has considered the impact of emissions during the construction and decommissioning of the Proposed Development on local air quality. The assessment considers construction traffic for the anticipated peak of activity in 2026. Demolition and site clearance of the Main Site will be undertaken prior to the main works, and these do not form part of this assessment.

8A.2.2 The assessment comprises a review of the impacts of dust emissions from the various activities associated with the construction phase of the Proposed Development during planned construction works on-site and the impacts associated with the emissions from construction traffic. Impacts on the sensitive human and ecological receptors in the vicinity of the Proposed Development Site have been assessed.

Cumulative Impacts

8A.2.3 Cumulative impacts from existing sources of pollution in the area are accounted for in the adoption of site-specific background pollutant concentrations from archive sources and a programme of project-specific baseline air quality monitoring in proximity to Proposed Development Site. It is recognised, however, that there is a potential impact on local air quality from emission sources which were not present at the time of the survey.

8A.2.4 The full list of short-listed cumulative schemes to be considered for the Proposed Development is detailed within Chapter 23: Cumulative and Combined Effects (ES Volume I, EN070009/APP/6.2).

8A.2.5 There is a risk that there could be cumulative impacts at dust sensitive receptors screened into the construction dust assessment for the Proposed Development due to the construction of other committed developments happening simultaneously in the area that are within the sensitivity definition of the same receptors. The

assessment of construction dust impacts reported in this assessment has been undertaken in line with industry-standard guidance to demonstrate the level of dust control required to mitigate any potential for significant effects. It is reasonable to assume that any other construction site in the vicinity of the Proposed Development will have done the same and will control dust through mitigation that is standard practice on all well managed construction sites across the United Kingdom (UK). For example, the Net Zero Teesside (NZT) Framework Construction Environmental Management Plan (CEMP) (The Net Zero Teesside Project Environmental Statement: Volume III, Appendix 5A CEMP) includes best practice control measures fort dust. There is also a NZT Framework Construction Workers' Travel Plan (CWTP) and a Framework Construction Traffic Management Plan (CTMP) (ES Volume III, Appendix 16B and 16C respectively). The Environmental Statement for HyGreen will also include a CEMP with relevant best practice control measures. It is, therefore, concluded that the risk of cumulative construction dust impacts is Low and considered to be Not Significant.

8A.2.6 The traffic data used in this assessment includes predicted traffic growth on modelled roads between the current and the future year baselines. The methodology to determine the growth in traffic on the local road network is described in Chapter 15: Traffic and Transport (ES Volume I, EN070009/APP/6.2). The predicted growth included in the traffic data includes increases in traffic associated with other committed developments in the area.

Sources of Information

8A.2.7 The information that has been used within this assessment includes pertinent information from:

- Chapter 4: Proposed Development (ES Volume I, EN070009/APP/6.2);
- Chapter 5: Construction Programme and Management (ES Volume I, EN070009/APP/6.2);
- details of the Proposed Development layout based on the Works Plans (EN070009/APP/2.4);
- Ordnance Survey mapping;
- construction traffic data as reported in Chapter 15: Traffic and Transport (ES Volume I, EN070009/APP/6.2); and
- baseline air quality data from AECOM diffusion tube monitoring within the air quality Study Area and from published sources and the relevant local authorities (Redcar and Cleveland Borough Council, Stockton-on-Tees Borough Council and Hartlepool Borough Council).

8A.3 Methodology Overview

8A.3.1 The remainder of this appendix describes the approach that has been taken to the assessment of emissions associated with the construction phase of the Proposed Development. This is broken down into the following sub-sections:

- qualitative assessment of construction dust; and
- quantitative assessment of construction phase road traffic emissions on local roads through dispersion modelling.

8A.3.2 Non-Road Mobile Machinery (NRMM) is considered within Chapter 8: Air Quality (ES Volume I, EN070009/APP/6.2) which indicates that emissions from NRMM associated with the Proposed Development will be temporary and localised and will be controlled via the application of appropriate emissions standards and through best-practice mitigation measures. For that reason, effects associated with construction phase NRMM emissions are highly unlikely to be significant and, therefore, have been scoped out of the assessment.

8A.4 Construction Dust Assessment

8A.4.1 The following activities have been screened as potentially significant, based on the nature of construction activities proposed:

- earthworks (soil stripping, remediation, spoil movement and stockpiling);
- demolition (removal of existing buildings and infrastructure);
- construction (including on-site concrete batching); and
- trackout (Heavy Goods Vehicles (HGV) movements on unpaved roads and offsite mud on the highway).

Magnitude Definitions

8A.4.2 The potential magnitude of dust emissions has been categorised following definitions and examples from the Institute of Air Quality Management (IAQM) guidance on the assessment of dust from demolition and construction (IAQM, 2024), as detailed in Table 8A-1. Note that in each case not all the criteria need to be met, and that other criteria may be used if justified in the assessment.

Table 8A-1: Example Definitions of the Magnitude of Construction/Demolition Activities

MAGNITUDE	DEMOLITION	EARTHWORKS	CONSTRUCTION	TRACKOUT
Large	Total building volume >75,000 m^3, potentially dust construction material (e.g., concrete), on-site crushing and screening, demolition activities >12 m above ground level.	Site area >110,000 m^2 potentially dusty soil type (e.g., clay). >10 heavy earth moving vehicles at once, bunds >6 m high.	Total building volume >75,000 m^3, on-site concrete batching, sandblasting.	>50 Heavy Duty Vehicle (HDV) (>3.5 tonne) peak outward movements per day, potentially dusty surface material (e.g., high clay content), unpaved road length >100 m.
Medium	Total building volume 12,000 to 75,000 m^3, potentially dusty construction material, demolition activities 6 to 12 m above ground level.	Site area 18,000 to 110,000 m^2, moderately dusty soil type (e.g. silt), 5 to 10 heavy earth moving vehicles at once, bunds 3 to 6 m high.	Total building volume 12,000 to 75,000 m^3, potentially dusty materials e.g. concrete, on-site concrete batching.	20 to 50 HDV (>3.5 tonne) peak outward movements per day, moderately dusty surface material (e.g., high clay content), unpaved road length 50 to 100 m.
Small	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g., metal cladding or timber), demolition activities <6 m above ground level, demolition during wetter months.	Site area <18,000m^2, large grain soil type (e.g., sand), <5 heavy earth moving vehicles at once, bunds <4 metres high.	Total building volume <12,000 m^3, low dust potential construction materials. E.g. metal/timber.	<20 HDV (>3.5 tonnes) peak outward movements per day, surface material low dust potential, unpaved road length <50 m.

Receptor Sensitivity Definitions

8A.4.3 The assessment of the significance of the effects of construction dust has been made with respect to the receptor and area sensitivity definitions as outlined in Table 8A-2 to Table 8A-5. Sensitivity definitions have been made with reference to the IAQM guidance (IAQM, 2024); receptors beyond 100 m are defined as low sensitivity to construction impacts, as it is considered that beyond this distance impacts will be limited; ecological receptors (including statutory designations, and non-statutory ecological receptors of local importance such as Local Wildlife Sites, national and local nature reserves) have been included as there are a number of ecological sites within 50 m from the Proposed Development Site boundary and within 50 m from the routes used by construction vehicles on the public highway, up to 250 m from the site entrances.

Table 8A-2: Receptor Sensitivity to Construction/Demolition Dust Effects

SENSITIVITY	HUMAN PERCEPTION OF DUST SOILING EFFECTS	PM_{10} HEALTH EFFECTS	ECOLOGICAL DUST DEPOSITION EFFECTS
High	Experience a high level of amenity; appearance, aesthetics or value of property would be diminished by soiling and the receptor is expected to be present continuously or regularly; for example, residential, museums, car showrooms or commercial horticulture.	Public present for eight hours per day or more, for example, residential, schools, care homes.	International/national designation and the designated feature is sensitive to dust soiling effects; for example, Special Areas of Conservation (SACs) for acid heathlands, or lichens, vascular species on Red Data List (Joint Nature Conservation Committee, JNCC).
Medium	Enjoy a reasonable level of amenity; appearance, aesthetics or value of property could be diminished by soiling; the receptor is not expected to be present continuously or regularly; for example, parks or places of work.	Only workforce present (no residential or high sensitivity receptors) eight hours per day or more.	Important plant species – unknown sensitivity to dust soiling; national designation which may be sensitive, for example Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	Enjoyment of amenity not reasonably expected; appearance or aesthetics or value of property not diminished by soiling; receptors are transient or present for limited time; for example, playing fields, farmland, footpaths, short-term car parks and roads.	Transient human exposure, for example footpaths, playing fields, parks.	Local designation where features may be sensitive to dust soiling, for example, local nature reserve.

8A.4.4 Distances have been measured from source to receptor in bands of less than 20 m, less than 50 m, less than 100 m and less than 250 m for earthworks and construction, in accordance with the IAQM guidance. For trackout the receptor distances have been measured from receptor to the trackout route (up to 50 m) and up to 250 m from the site exit. These distances bands have been applied in Table 8A-3 and Table 8A-4. For sensitivity of an area to ecological impacts, the distance bands are for less than 20 m and less than 50 m.

8A.4.5 In addition, the IAQM guidance considers the number of potentially affected receptors when defining the sensitivity i.e., the more receptors present, the more sensitive the area.

8A.4.6 The approach applied in the assessment and summarised in Table 8A-3 to Table 8A-5 differs from the default examples provided in the IAQM guidance in two respects:

- the adopted approach considers the sensitivity of individual receptors and their proximity to a source of emissions or work site, but not the absolute number of properties. This is considered to be a more robust and conservative approach than the default IAQM method; and
- distances have been calculated from the nearest boundary of the work site when considering on-site construction activities (earthworks, in this case), if the location of emissions source is not likely to be fixed throughout the duration of the works. This is a more conservative approach from the default IAQM method.

Table 8A-3: Sensitivity of the Area to Dust Soiling Effects on People/Property

INDIVIDUAL RECEPTOR SENSITIVITY	NUMBER OF RECEPTORS	DISTANCE FROM THE SOURCE (m)			
		LESS THAN 20	LESS THAN 50	LESS THAN 100	LESS THAN 250
High	1 or more	High	High	Medium	Low
Medium	1 or more	Medium	Low	Low	Low
Low	1 or more	Low	Low	Low	Low

Table 8A-4: Sensitivity of the Area to Human Health Impacts

INDIVIDUAL RECEPTOR SENSITIVITY	BASELINE ANNUAL MEAN PM_{10} CONCENTRATION	NUMBER OF RECEPTORS	DISTANCE FROM THE SOURCE (m)			
			LESS THAN 20	LESS THAN 50	LESS THAN 100	LESS THAN 250
High	Greater than 32 µg/m^3	1 or more	High	High	High	Medium
	28 to 32 µg/m^3	1 or more	High	High	Medium	Low
	24 to 28 µg/m^3	1 or more	High	Medium	Low	Low
	Less than 24 µg/m^3	1 or more	Medium	Low	Low	Low
Medium	Greater than 32 µg/m^3	1 or more	High	Medium	Low	Low
	28 to 32 µg/m^3	1 or more	Medium	Low	Low	Low
	Less than 28 µg/m^3	1 or more	Low	Low	Low	Low
Low	n/a	1 or more	Low	Low	Low	Low

Table 8A-5: Sensitivity of the Area to Ecological Impacts

INDIVIDUAL RECEPTOR SENSITIVITY	DISTANCE FROM THE SOURCE (m)	
	LESS THAN 20	LESS THAN 50
High	High	High
Medium	Medium	Low
Low	Low	Low

Risk Definitions

8A.4.7 The potential dust emission magnitude of each type of activity and the sensitivity of the area are combined to establish the likely risk of impacts, based on the assumption of no applied mitigation. Each activity category is considered in turn, using the relationships set out in the risk matrices reported in Table 8A-6.

Table 8A-6: Classification of Risk of Unmitigated Impacts

SENSITIVITY OF AREA	SENSITIVITY OF AREA		
	LARGE	MEDIUM	SMALL
Demolition			
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible risk
Earthworks and Construction			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible risk
Trackout			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Low risk	Negligible risk
Low	Low risk	Low risk	Negligible risk

8A.4.8 Based on the risk level of dust impacts, suitable good practice measures for dust control should be applied based on the highest level of risk to the area posed by each category of activities. The IAQM have published recommended packages of mitigation measures that, based on the opinion of the membership of the professional body, represent the level of potential risk. These measures all have a long history of successful implementation in the UK, and most are established good practice measures on any large construction site.

Magnitude Assessment

8A.4.9 For the purpose of this assessment, the Main Site is considered to be a large emissions source for fugitive dust emissions from earthworks (e.g. remediation works if required) and construction, and medium sources for trackout related activities (as the Proposed Development Site has over 500 m of tarmacked road before joining the public highway), as defined in Table 8A-1. Demolition and site clearance of the Main Site will be undertaken prior to the main works, and these do not form part of this assessment.

8A.4.10 Exact details on earthworks area or construction material volumes are not known, however estimates of around 300,000 m^3 of construction material is included in Chapter 21: Materials and Waste Management (ES Volume I, EN070009/APP/6.2). Based on that estimate and the overall scale of the Proposed Development, a "large" magnitude for all activities is a reasonable assumption.

8A.4.11 However, most areas away from the Main Site should be treated separately as lower magnitude sites as on-site activities will mainly relate to pipes installation, which as a lower dust production potential, as well as a shorter work time span. The Connection Corridors Site locations are considered to be medium emission sources for fugitive dust emissions from earthworks and construction, and small source for trackout and demolition related activities.

Receptor Identification

8A.4.12 The construction area spreads on both sides of the River Tees. Representative receptors are those closest to the Proposed Development Site boundary and are predominantly commercial and industrial properties located within the existing industrial area adjacent to the Proposed Development Site, each side of the A1085 between Middlesborough and Redcar, around the river docks and east of Stockton on Tees. There are also some high sensitivity residential properties near the edge of the Proposed Development Site boundary in Redcar (including Coatham), in the northern extent of Billingham, close to the A1185, and on Cowpen Lane in Cowpen Bewley. Other less sensitive receptors in the area include recreational areas such as Cowpen Bewley Woodland Park.

8A.4.13 The Proposed Development Site boundary also extends near and across the Teesmouth and Cleveland Coast ecological site SSSI, Special Protection Area (SPA) and Ramsar), the Redcar and Cleveland Local Wildlife Site (LWS), Hartlepool LWS and Stockton LWS.

8A.4.14 The magnitude of change in air pollutant concentrations of construction dust and so deposition rates will be greatest at these representative locations closest to the Proposed Development Site boundary. Assessment of the representative receptors therefore represents a worst-case assessment of the potential construction dust effects.

Area Sensitivity Assessment

8A.4.15 The sensitivity of the area is defined by considering the likely highest sensitivity receptors and the distance to the source for:

- dust soiling effects on people and amenity, including the number of affected receptors;
- human health effects of particulate matter (PM_{10}), including the number of affected receptors and consideration of existing background concentrations; and
- ecological effects of dust deposition.

8A.4.16 All sensitive receptors near to the Proposed Development Site are classified as being medium sensitive as they are all commercial properties except for some residential receptors located more than 20 m from the Proposed Development Site boundary.

8A.4.17 There are high sensitivity ecological sites within the Study Area, namely Teesmouth and Cleveland Coast ecological site, some less than 20 m from the Proposed Development Site boundary. The LWS are of low sensitivity, as per the IAQM guidance.

8A.4.18 The existing background PM_{10} concentration is 15.1 micrograms per cubic metre ($\mu g/m^3$), less than the lowest screening category within the IAQM methodology (28 $\mu g/m^3$), therefore representing the lowest baseline risk.

8A.4.19 The sensitivity of the area to dust soiling effects at nearby sensitive receptors is classified as medium for the Main Site for effects on people and property and high for the Connection Corridors, based on the sensitivity of receptors within the study area and their distance from dust sources (refer to Table 8A-7). The sensitivity of the area to human health impacts is low for the Main Site and medium for the connection corridors based on the existing baseline PM_{10} level, the number of sensitive receptors and their distance from dust sources.

Table 8A-7: Area Sensitivity for Receptors of Construction Dust

ACTIVITY	SITE	POTENTIAL IMPACT	RECEPTOR SENSITIVITY AND DISTANCE	AREA SENSITIVITY
Demolition	Main	Dust Soiling	Not Applicable	Not Applicable
		Human Health	Not Applicable	Not Applicable
		Ecological	Not Applicable	Not Applicable
	Connection corridors	Dust Soiling	High Sensitivity and <20m	High
		Human Health	High sensitivity <20 m	Medium
		Ecological	High sensitivity <20 m	High

ACTIVITY	SITE	POTENTIAL IMPACT	RECEPTOR SENSITIVITY AND DISTANCE	AREA SENSITIVITY
Earthworks	Main	Dust Soiling	Medium sensitivity and <20 m	Medium
		Human Health	Medium Sensitivity <20 m	Low
		Ecological	High sensitivity <20 m	High
	Connection Corridors	Dust Soiling	High Sensitivity and <20m	High
		Human Health	High sensitivity <20 m	Medium
		Ecological	High sensitivity <20 m	High
Construction	Main	Dust Soiling	Medium sensitivity and <20 m	Medium
		Human Health	Medium Sensitivity <20 m	Low
		Ecological	High sensitivity <20 m	High
	Connection Corridors	Dust Soiling	High Sensitivity and <20m	High
		Human Health	High sensitivity <20 m	Medium
		Ecological	High sensitivity <20 m	High
Trackout	Main	Dust Soiling	Medium sensitivity and <20 m	Medium
		Human Health	Medium Sensitivity <20 m	Low
		Ecological	High sensitivity <20 m	High
	Connection Corridors	Dust Soiling	High Sensitivity and <20m	High
		Human Health	High sensitivity <20 m	Medium
		Ecological	High sensitivity <20 m	High

8A.4.20 The risk of impacts from unmitigated activities has been determined through combination of the potential dust emission magnitude and the sensitivity of the area, for each activity to determine the level of mitigation that should be applied. The risk of impacts from unmitigated activities are summarised in Table 8A-8.

Table 8A-8: Risk of Impacts from Unmitigated Activities

SITE	ACTIVITY	DEMOLITION	EARTHWORKS	CONSTRUCTION	TRACKOUT
Main	Magnitude	Medium	Large	Large	Medium
	Risk of impacts from unmitigated activities				
	Dust soiling	Not Applicable	Medium Risk	Medium Risk	Low Risk
	Health PM_{10}	Not Applicable	Low Risk	Low Risk	Low Risk
	Ecology	Not Applicable	High Risk	High Risk	Medium Risk
Connection Corridors	Magnitude	Small	Medium	Medium	Small
	Risk of impacts from unmitigated activities				
	Dust soiling	Medium Risk	Medium Risk	Medium Risk	Low Risk
	Health PM_{10}	Low Risk	Medium Risk	Medium Risk	Negligible Risk
	Ecology	Medium Risk	Medium Risk	Medium Risk	Low Risk

8A.4.21 The risk assessment for construction dust indicates that there will be a negligible to medium risk of unmitigated dust impacts on human health (PM_{10}) and a low to medium risk of dust impacts on dust soiling from unmitigated demolition (for the Connection Corridors), earthworks, construction and track out activities. The assessment also shows that the impact of unmitigated construction activities on ecological sites is likely to be high.

8A.4.22 These risk classifications are solely used to select the appropriate schedule of mitigation measures from IAQM guidance. For all but the smallest of sites, the use of the high-risk schedule of measures represents good working practice, as listed in section 8.2 of the IAQM guidance. Examples are listed in Section 8.5 of Chapter 8: Air Quality (ES Volume I, EN070009/APP/6.2). Additional site-specific measures will be identified in the Final CEMP(s) where necessary.

8A.5 Construction Traffic Assessment

Introduction

8A.5.1 For the construction traffic assessment all affected roads have been assessed at a 'detailed level' of assessment. As detailed in IAQM Guidance, a 'detailed level' assessment uses dispersion modelling to estimate pollutant concentrations more accurately, taking into account additional variables. The detailed assessment of local air quality reported herein has used the Cambridge Environmental Research Consultants (CERC) Atmospheric Dispersion Modelling System (ADMS) Roads dispersion model (version 5.0.1) to predict road pollutant contributions at identified sensitive receptors.

8A.5.2 Predictions have been made for the baseline year (2019) and the peak construction year (month 17) with the Proposed Development construction work and without the Proposed Development construction work. On the basis of these predictions, the change in key pollutant concentrations (NO_2, PM_{10} and $PM_{2.5}$) associated with the Proposed Development have been established.

8A.5.3 Predictions have been verified by comparing the baseline modelling predictions and baseline air quality monitoring data. Where systematic bias is evident in the base year verification, an adjustment factor has been calculated (as set out in the Bias Adjustment of Road Contribution Section of this Appendix) and applied to bring modelled concentrations more in line with monitored concentrations.

8A.5.4 The impact of the Proposed Development is based on modelled predictions of pollutant concentrations in the scenarios considered, and Defra Local Air Quality Management Technical Guidance (LAQM) guidance and tools, including the current version of the NO_x to NO_2 conversion (Defra, 2020a) approach and background maps (Defra, 2020b). Predictions are also informed by two-way 24-hour Annual Average Daily Traffic (AADT) flow data as sourced from Chapter 15: Traffic and Transport (ES Volume I, EN070009/APP/6.2), and hourly sequential meteorological data from a representative meteorological station.

8A.5.5 Further details of the assessment methodology including the inputs used in the ADMS-Roads model (including meteorology data), model post-processing (e.g. NOx to NO_2 conversion) and the approach taken to model verification (including all monitoring locations used in the verification process) are presented in the following sub-sections.

8A.5.6 Representative sensitive receptors (e.g. residential properties and ecological sites) have been selected for assessment within the local air quality assessment. These include those sensitive receptors located closest to the Study Area for construction effects.

8A.5.7 The predicted air quality impacts of the Proposed Development have been evaluated against relevant national, regional and local air quality planning policy. An evaluation of the significance of the local air quality assessment findings at sensitive receptors for human health has been undertaken in accordance with IAQM/Environmental Protection UK (EPUK) guidance. It is considered that the determination of significance using the IAQM/EPUK guidance is more conservative for the assessment of the Proposed Development than the use of significance criteria provided in National Highways (formerly Highways England) guidance, where a significant effect can only occur when there is an exceedance of an air quality standard in either future baseline or future construction phase scenarios.

8A.5.8 The significance of the effects on ecological receptors, including the magnitude of change in NOx and nitrogen deposition, are considered as part of the ecology and nature conservation assessment (see Chapter 12: Ecology and Nature Conservation (ES Volume I, EN070009/APP/6.2), Chapter 13: Ornithology (ES Volume I, EN070009/APP/6.2) and Chapter 14: Marine Ecology (ES Volume I,

EN070009/APP/6.2)) and the Report to Inform Habitats Regulations Assessment (EN070009/APP/5.10).

Screening Criteria

8A.5.9 The construction phase traffic assessment considers the impact of emissions associated with additional heavy-duty vehicles (HDV – vehicles >3.5 tonnes (t) in weight) and light duty vehicles (LDV) (LDV – vehicles <3.5 t in weight) introduced to the local road network due to construction work associated with the Proposed Development, including those associated with the import and export of materials to and from Proposed Development Site and the commuting of contractors.

8A.5.10 The screening of traffic data has been undertaken using both the approach set out in the DMRB guidance and the approach set out by IAQM guidance.

8A.5.11 The IAQM approach identifies a larger air quality Study Area and more stringent criteria for the identification of affected road links, and therefore this has been applied to the assessment. The IAQM criteria is summarised in Table 8A-9.

8A.5.12 The construction traffic assessment considers those areas where a change in traffic above the criteria identified in Table 8A-9 occurs in the immediate area around the Proposed Development Site. There are no Air Quality Management Areas (AQMAs) declared within the Study Area, consequently only roads with changes of more than 500 AADT in LDVs or 100 AADT in HDVs are considered to be within the construction Study Area. The Study Area is shown in Figure 8-3 (ES Volume I, EN070009/APP/6.2).

Table 8A-9: Screening Criteria for Determining the Study Area

IF THE DEVELOPMENT WILL:	INDICATIVE CRITERIA TO PROCEED TO AN AIR QUALITY ASSESSMENT
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.
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.

Modelled Scenarios

8A.5.13 A quantitative assessment of the impact of exhaust emissions from additional road traffic during the anticipated peak of activity in 2026 has been undertaken for the following scenarios:

- 2019 Baseline Scenario (for model verification process) (Base);

- 2026 (based on construction peak) Future Construction Year Base (Future Baseline) + Committed Development Scenarios (Future Year without Proposed Development); and
- 2026 (based on construction peak) Future Construction Year Base + Committed Development Scenarios + Peak Construction Scenario (month 17) (Future Year with Proposed Development).

Model Inputs

8A.5.14 The general model conditions that have been used in the assessment of road traffic emissions are summarised in Table 8A-10. Other more detailed data used to model the dispersion of emissions is considered below.

Table 8A-10: General ADMS Roads Model Conditions

VARIABLE	INPUT
Surface Roughness at source	0.5 m
Minimum Monin-Obukhov length for stable conditions	10 m
Receptors	Selected discrete receptors
Receptor location	X,Y co-ordinates determined by Geographic Information Systems (GIS). The height of residential receptors will be set at 1.5 m
Emissions	NO_X, PM_{10} and $PM_{2.5}$
Emission Factors	Emission Factor Toolkit version 12.0 for 2019 for baseline and construction year (2026) scenarios
Meteorological Data	1 year of hourly sequential data, Durham Tees Valley meteorological site (2019)
Emission Profiles	None used
Terrain Types	Flat terrain
Model Output	Long-term annual mean NO_X concentration ($\mu g/m^3$) Long-term annual mean PM_{10} concentration ($\mu g/m^3$) Long-term annual mean $PM_{2.5}$ concentration ($\mu g/m^3$)

Traffic Data

8A.5.15 The traffic data used in this assessment takes the form of AADT.

8A.5.16 The future construction base year is 2026. The construction base year is the period where the number of construction vehicles accessing the Proposed Development Site will peak and is assumed to be a worst-case scenario for assessing potential

effects due to construction traffic (month 17 of construction). AADT traffic flows are presented in Table 8A-11 (for further detail, please refer to Chapter 15: Traffic and Transport, ES Volume I, EN070009/APP/6.2)).

Table 8A-11: Road Traffic Data

ROAD NAME	AVERAGE SPEED (KM/H)	BASE		FUTURE YEAR WITHOUT PROPOSED DEVELOPEMENT		FUTURE YEAR WITH PROPOSED DEVELOPMENT	
		Total AADT	HDV	Total AADT	HDV	Total AADT	HDV
A1085 Trunk Road, 100 m east of Ennis Road	70	12,274	1,049	15,468	1,510	15,757	1,510
A1085 Trunk Road, 1.34 km south of West Coatham Lane	82	14,387	1,275	24,062	2,423	25,132	2,608
A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	52	11,791	762	12,805	840	12,950	840
A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	83	16,058	2,012	26,160	3,240	27,230	3,425
A1085 Broadway, 235 m east of Birchington Avenue	53	8,093	521	12,096	585	12,333	585
B1380 High Street, east of Lackenby Lane	50	9,835	826	10,780	930	10,836	930
A66, east of Whitworth Road	66	19,865	3,662	30,331	5,508	31,050	5,600
A1046 Port Clarence Road, north of Beech Terrace	47	7,612	896	8,046	952	8271	988
A178 Seaton Carew Road, north of Huntsman Drive	72	7,814	998	8,267	1,063	8,492	1,099
Unnamed Road, east of A178 Seaton Carew Road	59	4,206	860	4583	965	4,845	1,001
A1053 Greystone Road	94	14,387	1,392	21,208	2,824	21,405	2,916

ROAD NAME	AVERAGE SPEED (KM/H)	BASE		FUTURE YEAR WITHOUT PROPOSED DEVELOPEMENT		FUTURE YEAR WITH PROPOSED DEVELOPMENT	
		Total AADT	HDV	Total AADT	HDV	Total AADT	HDV
A174 (West of Greystone Roundabout)	106	31,758	1,936	36,132	3,279	36,273	3,371
B1275 Belasis Avenue	47	2,451	72	2,609	86	2,722	104
A1185 (west of A178 Seaton Carew Road)	72	5,651	1,026	5,133	1,110	5,206	1,146
Site Access	32	0	0	2,157	190	35,16	375
A1046 Haverton Hill Road [1]	47	14010	1115	14,709	1,178	14,822	1,196

[1] Base data is from year 2022

Emissions Data

8A.5.17 The magnitude of road traffic emissions for the baseline and with development scenarios have been calculated from traffic flow data using the Defra's current emission factor database tool EFT 12.0 (Defra, 2023). The assessment considers the construction phase impact of road traffic emissions at receptors adjacent to roads in the vicinity of the Proposed Development Site.

Modelled Domain – Discrete Receptors

8A.5.18 In line with guidance and standard practice, representative worst-case receptors located within 200 m of road links associated with the Proposed Development (i.e., the Study Area for the traffic assessment) are considered in this assessment. For human health receptors, receptor locations represent the nearest façade of a residential property, school or medical facility to the road links considered. For ecology receptors, they represent the nearest part of each designated area to the road links, with additional receptor points set in a transect with increasing distance from the road links, to demonstrate the spatial variation in predicted impacts across each designated site.

8A.5.19 The receptors for which the impact of road traffic emissions have been predicted are listed in Table-8A-12 and Table 8A-13 (R = Road Receptor and RE = Road Ecological Receptor).

Table-8A-12: Modelled Human Receptors

RECEPTOR ID	X (m)	Y (m)	DESCRIPTION	DISTANCE TO MAIN SITE (km)
R001	450068	521631	Saltview Terrace, Stockton-on-Tees, Middlesbrough TS2 1SQ	6.8
R002	450049	521620	Saltview Terrace, Stockton-on-Tees, Middlesbrough TS2 1SQ	6.8
R003	449463	521974	High Clarence Primary School. Port Clarence Road, Middlesbrough TS2 1SU	7.2
R004	449092	522334	2 Fieldview Close, Stockton-on-Tees, Middlesbrough TS2 1TN	7.4
R005	455429	520571	87 Broadway, Middlesbrough TS6 7HS	4.4
R006	455434	520610	51 Eversham Road, Middlesbrough TS6 7ER	4.3
R007	455189	520409	Grangetown Primary School, St Georges Rd West, Middlesbrough TS6 7JA	4.6
R008	455306	520890	139 Bolckow Road, Grangetown, Middlesbrough TS6 7EJ	4.1

RECEPTOR ID	X (m)	Y (m)	DESCRIPTION	DISTANCE TO MAIN SITE (km)
R009	454846	520708	8 St Nicholas Close, Grangetown, Middlesbrough TS6 7SY	4.4
R010	459216	524569	2 Kirkleatham Lane, Redcar TS10 5BZ	2.6
R011	459262	524598	4 Corporation Road, Redcar TS10 1PB	2.7
R012	456153	518576	2 Keepersgate, Eston, Middlesbrough TS6 9NY	6.3
R013	456240	519019	19 Moorgate, Middlesbrough, TS6 9QE	5.8
R014	456043	518989	19 Gaisdale Close, Middlesbrough, TS6 8DG	5.9
R015	456119	518963	239 Wychgate, Middlesbrough TS6 9LW	5.9
R016	456477	519134	23 High Street, Middlesbrough, TS6 8DL	5.7
R017	458240	520240	North Lodge, Wilton, Lazenby, Redcar TS10 4QZ	4.9
R018	457463	519859	Wilton Primary School, 12 High Street, Lazenby, Middlesbrough TS6 8DX	5.1
R019	457559	519861	2 Grange Estate, Middlesbrough TS6 8EJ	5.1
R020	457455	519763	Brookfield Care Home, High Street, Lazenby, Middlesbrough TS6 8DX	5.2
R021	457311	519649	10 Chestnut Close, Middlesbrough TS6 8DT	5.2
R022	457016	519403	Police House, Eston Road, Lazenby, Middlesbrough TS6 8DW	5.4

Table 8A-13: Modelled Ecological Receptors

RECEPTOR ID	X (m)*	Y (m)*	DESCRIPTION	DISTANCE TO MAIN SITE (km)
RE001	450640	523527	Teesmouth and Cleveland Coast SSSI and SPA	5.5
RE002	458966	524537	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	2.4
RE003	457334	525348	Teesmouth and Cleveland Coast SSSI	0.6

RECEPTOR ID	X (m)*	Y (m)*	DESCRIPTION	DISTANCE TO MAIN SITE (km)
RE004	446972	523081	Charlton's Pond LNR	9.2
RE005	450050	521413	Teesmouth and Cleveland Coast SSSI and SPA	7.4
RE006	450744	522993	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	5.6
RE007	450758	522995	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	5.6
RE008	451133	523662	Teesmouth and Cleveland Coast SSSI and SPA	5.1
RE009	450050	521413	Teesmouth and Cleveland Coast SSSI and SPA	6.9
RE010	456441	518679	Wilton Woods Complex LWS	6.1

**Coordinate of the closest point to the modelled road, other points were also model to form a transect up to 200 m from the road's edge.*

Meteorological Data

8A.5.20 The model runs carried out for the Proposed Development used hourly sequential data from Durham Tees Valley, year 2019, consistent with the year chosen to verify the performance of the model against measured NO_2 concentrations. This meteorological site is located approximately 21 km south-west of the Study Area with a measured prevailing wind of between 3 and 5 m/s from south-south-west. A wind rose for this site is presented in Plate 8A-1.

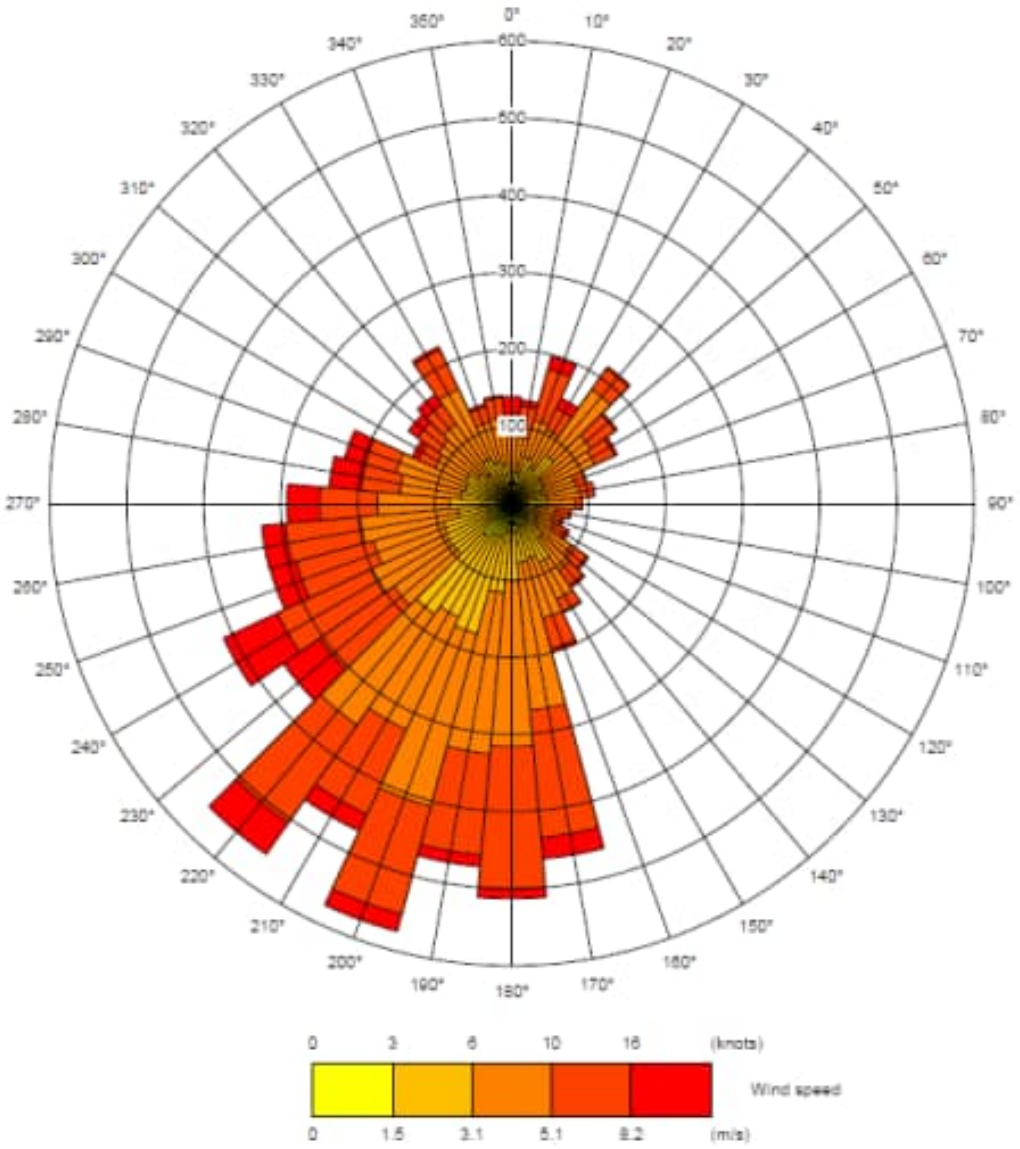

Plate 8A-1: Durham Tees Valley 2019 Wind Rose

Background Concentrations

8A.5.21 Annual average background concentrations were taken from Defra's 2018 baseline 1 x 1 km background maps and adjusted using Defra's adjustment tool removing emissions from road traffic for motorways and primary or trunk A roads (Defra, 2020c). The data used in the assessment is presented for the centre of each 1 x 1 km grid square in Table 8A-14. The Defra background concentrations have been compared against local authority background monitoring, which indicates that the Defra data and local data are in good agreement and that therefore no uplift in Defra data is required. Additionally, to provide for a conservative assessment, 2019 background concentrations have been used in the assessment of the construction phase, as can be seen in Table 8A-4 lower concentrations are expected in 2026 and so using 2019 backgrounds will result in higher total pollutant concentrations.

Table 8A-14: Modelled Background Concentrations

POLLUTANT	YEAR	CONCENTRATION RANGE ACROSS THE STUDY AREA (µg/m^3)
NO_2	2019	10.7 - 20.6
	2025	8.8 – 17.0
PM_{10}	2019	11.0 – 13.2
	2025	10.3 – 12.4
$PM_{2.5}$	2019	7.1 – 7.9
	2025	6.5 – 7.2

Consideration of Terrain

8A.5.22 Emissions from road traffic make the greatest contribution to pollutant concentrations at sensitive receptors adjacent to the roadside. For this reason, there is not normally a large variation in height between the emission source and residential properties next to the roads included in the model. Therefore, terrain is not included in the road traffic modelling assessment.

NO_x to NO_2 Conversion

8A.5.23 To accompany the publication of a previous version of the guidance document LAQM.TG(22) (Defra, 2022), a NO_x to NO_2 converter was made available as a tool to calculate the road NO_2 contribution from modelled road NOx contributions. The tool comes in the form of an MS Excel spreadsheet and uses borough specific data to calculate annual mean concentrations of NO_2 from dispersion model output values of annual mean concentrations of NOx. Version 8.1 (April 2019) of this tool has been used to calculate the total NO_2 concentrations at receptors from the modelled road NOx contribution and associated background concentration. Due to the location of the Proposed Development, Redcar and Cleveland Borough Council (RCBC) has been specified as the local authority and the 'All other non-urban UK traffic' mix selected.

Bias Adjustment of Road Contribution NO_x, NO_2, PM_{10} and $PM_{2.5}$

8A.5.24 The modelled road NO_x contributions from the ADMS-Roads model has been adjusted for bias following the method described in LAQM.TG(22). The purpose of this exercise is to bring the baseline model performance in line with known pollutant concentrations at set locations within the model domain. The level of adjustment identified in the baseline scenario is then applied to future scenarios.

8A.5.25 Monitoring data used for model verification typically includes that sourced from local authorities, if appropriate, and data gathered by project-specific baseline surveys. A baseline NO_2 monitoring survey has been undertaken for the Proposed Development which included 21 monitoring locations. From these 21 monitoring locations DT1, DT2, DT4, DT5, DT6, DT7, DT8, DT18 and DT21 were on the roadside of roads included in the model and therefore these were appropriate to use in the construction road traffic model verification.

8A.5.26 Where diffusion tube monitoring survey has taken place for less than 12 months, it is necessary to annualise the monitoring results using the method described in LAQM.TG(22) in order to obtain a projected annual mean concentration for the existing baseline year of the assessment. This provides a monitored dataset against which modelled concentrations can be directly compared.

8A.5.27 Annualisation involves comparing the monitored diffusion tube concentrations from the survey to concentrations monitored at nearby (<50 km away) background continuous monitoring stations over the same period (July 2022 – Oct 2022). Monitored diffusion tube concentrations are adjusted using the Ra factor, which is the average of ratios between the period mean (Pm) and annual mean (Am) for each continuous monitor. Diffusion tubes concentrations are then adjusted using a national bias adjustment factor which accounts for systematic bias arising in the treatment of diffusion tubes during laboratory analysis. 2019 was used as it is the year the traffic assessment was completed and the last year without any impacts from Covid-19. Further details on the selection of 2019 are provided in the Transport Assessment (ES Volume III, EN070009/APP/6.4). The resultant NO_2 concentrations are presented in Table 8A-15.

Table 8A-15: Annualisation of Diffusion Tube Data

SITE	UNADJUSTED MEAN ($\mu g/m^3$)	ANNUALISED MEAN, A_M ($\mu g/m^3$) / PERIOD MEAN, P_M ($\mu g/m^3$)	BIAS ADJUSTED MEAN NO_2 ($\mu g/m^3$)
DT1	23.4	1.4	29.7
DT2	34.9	1.4	44.3
DT3	14.3	1.4	18.2
DT4	16.5	1.4	20.9
DT5	17.2	1.4	21.8
DT6	39.1	1.4	49.7
DT7	23.4	1.4	29.7
DT8	17.2	1.4	21.8
DT9	12.7	1.4	16.2
DT10	9.6	1.4	12.2
DT11	11.4	1.4	14.5
DT12	9.0	1.4	11.4
DT13	15.2	1.4	19.3
DT14	13.5	1.23	15.1
DT15	15.2	1.5	20.7
DT16	14.8	1.4	18.8
DT17	14.6	1.5	19.9
DT18	18.5	1.5	25.3

SITE	UNADJUSTED MEAN ($\mu g/m^3$)	ANNUALISED MEAN, A_M ($\mu g/m^3$) / PERIOD MEAN, P_M ($\mu g/m^3$)	BIAS ADJUSTED MEAN NO_2 ($\mu g/m^3$)
DT19	13.0	1.4	16.5
DT20	15.1	1.4	19.2
DT21	19.9	1.4	25.3

The continuous monitoring stations used for annualisation are Middlesborough, Stockton-on-Tees and Billingham, all part of the Defra's Automatic Urban Rural Network (AURN)

8A.5.28 A review of existing and publicly available local authority data has been undertaken and found that no monitoring locations were suitable for model verification. Therefore, a project-specific baseline survey was undertaken to collect data to allow air quality model verification to be completed.

8A.5.29 Verification calculations yielded a bias adjustment factor of 2.21 with a Root Mean Square Error (RMSE) of 4.7. An RMSE of less than 10% of the air quality objective (10% of 40.0 $\mu g/m^3$ is 4.0 $\mu g/m^3$) is considered ideal and an RMSE of less than 25% of the air quality objective (25% of 40.0 $\mu g/m^3$ is 10.0 $\mu g/m^3$) is considered acceptable.

8A.5.30 A second verification zone was defined, including all tubes next to acceleration zones as the model behaved differently there. This means DT2 and DT6 were separated off the main verification zone. However, as there are no sensitive receptors nearby, this separate factor was not used for any selected receptors.

Table 8A-16: Summary of the Bias Adjustment Process

TUBE ID	ZONE	2019 ANNUALISED MONITORED ROAD NO_X ($\mu g/m^3$)	2019 ANNUAL MEAN MODELLED ROAD NO_X ($\mu g/m^3$) BEFORE ADJUST-MENT	2019 ANNUAL MEAN MODELLED ROAD NO_X ($\mu g/m^3$) AFTER ADJUSTMENT	VERIFICATION FACTOR FOR ROAD NO_X ADJUSTMENT
DT1	Main	30.7	9.35	20.6	2.21
DT4		15.7	7.06	15.6	
DT5		17.4	11.59	25.6	
DT7		37.1	6.30	13.9	
DT8		19.8	10.47	23.1	
DT18		19.2	7.30	16.1	
DT21		9.1	6.29	13.9	

8A.5.31 The verification factor was applied to the predicted road NOx concentrations prior to the conversion of road NOx to total NO_2 concentrations at the receptors.

8A.5.32 There is insufficient roadside measurement data for the primary pollutants PM_{10} or $PM_{2.5}$ within the Study Area. The same bias adjustment factor derived for the

modelled contributions of the primary pollutant NOx has been applied to the modelled road PM_{10} and $PM_{2.5}$ contributions, as recommended in LAQM.TG(22).

Predicting the Number of Days in Which the NO_2 Hourly Mean Objective is Exceeded

8A.5.33 Research projects completed on behalf of Defra and the Devolved Administrations, have concluded that the hourly mean NO_2 objective is unlikely to be exceeded if annual mean concentrations are predicted to be less the 60 µg/m^3.

8A.5.34 In 2003, Laxen and Marner (Laxen and Marner, 2003) concluded: '*...local authorities could reliably base decisions on likely exceedances of the 1-hour objective for nitrogen dioxide alongside busy streets using an annual mean of 60 µg/m^3 and above.*'

8A.5.35 The findings presented by Laxen and Marner (2003) are further supported by AEAT (AEAT, 2008) who revisited the investigation to complete an updated analysis including new monitoring results and additional monitoring sites. The recommendations of this report are: '*Local authorities should continue to use the threshold of 60 µg/m^3 NO_2 as the trigger for considering a likely exceedance of the hourly mean nitrogen dioxide objective*.'

8A.5.36 Therefore, this assessment evaluates the likelihood of exceeding the hourly mean NO_2 objective by comparing predicted annual mean NO_2 concentrations at all receptors to an annual mean equivalent threshold of 60 µg/m^3. Where predicted concentrations are below this value, it can be concluded that the hourly mean NO_2 objective (200 µg/m^3 NO_2 not to be exceeded more than 18 times per year) will be achieved.

Predicting the Number of Days in Which the PM_{10} 24-Hour Mean Objective is Exceeded

8A.5.37 The guidance document LAQM.TG(03) (Defra, 2003) sets out the method by which the number of days in which the PM_{10} 24hr objective is predicted to be exceeded can be obtained based on a relationship with the predicted PM_{10} annual mean concentration. The most recent guidance LAQM.TG(22) suggests no change to this method. As such, the formula used within this assessment is:

No. PM_{10} 24-hour mean exceedances = $-18.5 + 0.00145 \times C^3 + (206/C)$

Where C is the annual mean concentration of PM_{10}

Specialized Model Treatments

8A.5.38 No specialised model treatments have been used in the assessment of construction road traffic emissions.

Calculation of Nitrogen Deposition for Ecological Receptors

8A.5.39 Conversion factors for calculating nitrogen deposition from modelled NO_2 are found in the DMRB LA 105 Air Quality (Highways England, 2019).

8A.5.40 The conversion rates and factors used in the assessment are detailed in Table 8A-17.

Table 8A-17: Conversion Factors – Calculation of Nutrient Nitrogen Deposition

POLLUTANT	DEPOSITION VELOCITY GRASSLANDS (m/s)	DEPOSITION VELOCITY FORESTS (m/s)	CONVERSION FACTOR (µg/m^3/s TO kg/ha/yr)
NO_2	0.0015	0.003	96

Results of the Construction Traffic Assessment

8A.5.41 The predicted change in annual mean NO_2 concentrations that are predicted to occur due to traffic associated with Proposed Development construction works at the selected sensitive receptors, are presented in Table 8A-18. Any inconsistencies between the total and the predicted change combined with the future year without development concentrations are due to rounding only.

8A.5.42 The maximum predicted change in annual mean NO_2 concentrations at the selected sensitive receptors is +0.1 µg/m^3, which would occur in the vicinity of receptors near Saltview Terrace (R001, R002), High Clarence Primary School (R003), Fieldview Close (R004), Broadway (R005), Eversham Road (R006), Bolckow Road (R008), St Nicholas Close (R009), Kirkleatham Lane (R010) and Corporation Road (R011). The reported change in NO_2 concentration at this location is due to the impact of emissions from construction road traffic.

8A.5.43 The total annual mean NO_2 at all the receptors would remain below the annual mean NO_2 Air Quality Assessment Level (AQAL), with the highest total concentration of 24.7 µg/m^3 at receptor R003, therefore the change is not predicted to lead to a risk of the annual mean or the hourly mean AQAL being exceeded.

8A.5.44 The significance of the predicted change in annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations during Proposed Development construction in planning terms is discussed in Chapter 8: Air Quality (ES Volume I, EN070009/APP/6.2).

Table 8A-18: Predicted Change in Annual Mean NO_2 Concentrations at Discrete Receptors (µg/m^3) due to Construction Road Traffic Emissions, with Comparison Against AQAL

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
R001	18.8	<0.1	0.2	18.9	47.2
R002	19.1	<0.1	0.2	19.1	47.8
R003	24.7	0.1	0.3	24.8	62.0
R004	18.3	<0.1	0.2	18.4	46.1
R005	16.5	<0.1	0.2	16.6	41.4
R006	17.8	<0.1	0.2	17.8	44.6
R007	14.3	<0.1	0.1	14.4	35.9
R008	16.7	<0.1	0.2	16.8	42.0

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
R009	16.7	<0.1	0.2	16.8	42.1
R010	17.6	<0.1	0.2	17.6	44.1
R011	17.1	<0.1	0.1	17.2	43.0
R012	19.0	<0.1	0.1	19.0	47.5
R013	15.1	<0.1	<0.1	15.1	37.8
R014	12.6	<0.1	<0.1	12.6	31.4
R015	13.9	<0.1	<0.1	13.9	34.7
R016	17.1	<0.1	<0.1	17.1	42.8
R017	14.8	<0.1	<0.1	14.8	37.1
R018	12.1	<0.1	<0.1	12.1	30.2
R019	13.4	<0.1	<0.1	13.5	33.7
R020	13.5	<0.1	<0.1	13.5	33.7
R021	14.2	<0.1	0.1	14.3	35.6
R022	14.7	<0.1	0.1	14.8	36.9

8A.5.45 The change in annual mean PM_{10} and $PM_{2.5}$ concentrations at discrete receptors predicted to occur from the road traffic associated with the construction of the Proposed Development, at the selected sensitive receptors, is presented in Table 8A-19 and Table 8A-20. Any inconsistencies between the total and the predicted change combined with the future year without development concentrations are due to rounding only.

8A.5.46 The maximum predicted change in annual mean PM_{10} and $PM_{2.5}$ concentrations at the selected sensitive receptors is +0.1 µg/m^3. This change in annual mean PM_{10} and $PM_{2.5}$ concentrations would not be a perceptible at air quality sensitive receptors, nor would it result in additional days on which the PM_{10} 24-hour objective is exceeded.

8A.5.47 The predicted annual mean concentrations are well below the respective AQAL for PM_{10} and $PM_{2.5}$.

Table 8A-19: Predicted Change in Annual Mean PM_{10} Concentrations at Discrete Receptors (µg/m^3) due to Construction Road Traffic Emissions, with Comparison Against AQAL

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL	EXCEEDANCES (NB OF DAYS)
R001	12.3	<0.1	<0.1	12.3	30.7	1

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL	EXCEEDANCES (NB OF DAYS)
R002	12.4	<0.1	<0.1	12.4	31.0	<1
R003	13.1	0.1	0.1	13.2	32.9	<1
R004	12.3	<0.1	<0.1	12.4	30.9	<1
R005	13.0	<0.1	<0.1	13.1	32.7	<1
R006	13.6	<0.1	<0.1	13.6	34.0	<1
R007	12.2	<0.1	<0.1	12.2	30.5	1
R008	13.1	<0.1	<0.1	13.1	32.8	<1
R009	13.0	<0.1	<0.1	13.0	32.6	1
R010	12.7	<0.1	<0.1	12.8	31.9	1
R011	12.6	<0.1	<0.1	12.6	31.5	1
R012	13.4	<0.1	<0.1	13.4	33.5	<1
R013	14.5	<0.1	<0.1	14.6	36.4	<1
R014	12.3	<0.1	<0.1	12.3	30.7	1
R015	12.8	<0.1	<0.1	12.8	31.9	1
R016	15.3	<0.1	<0.1	15.3	38.3	<1
R017	12.9	<0.1	<0.1	12.9	32.3	1
R018	11.9	<0.1	<0.1	11.9	29.8	1
R019	12.5	<0.1	<0.1	12.5	31.2	1
R020	12.5	<0.1	<0.1	12.5	31.2	1
R021	12.8	<0.1	<0.1	12.8	31.9	1
R022	12.9	<0.1	<0.1	12.9	32.2	1

Table 8A-20: Predicted Change in Annual Mean $PM_{2.5}$ Concentrations at Discrete Receptors ($\mu g/m^3$) due to Construction Road Traffic Emissions, with Comparison Against AQAL

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
R001	7.9	<0.1	0.1	7.9	39.4
R002	7.9	<0.1	0.1	7.9	39.7
R003	8.4	<0.1	0.1	8.4	41.9
R004	7.8	<0.1	0.1	7.9	39.3
R005	8.3	<0.1	0.1	8.3	41.6

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
R006	8.6	<0.1	0.1	8.6	43.0
R007	7.8	<0.1	<0.1	7.9	39.3
R008	8.3	<0.1	0.1	8.4	41.8
R009	8.3	<0.1	0.1	8.3	41.5
R010	8.2	<0.1	0.1	8.2	41.0
R011	8.1	<0.1	0.1	8.1	40.6
R012	8.4	<0.1	<0.1	8.4	42.0
R013	8.6	<0.1	<0.1	8.6	43.0
R014	7.7	<0.1	<0.1	7.7	38.4
R015	7.9	<0.1	<0.1	8.0	39.8
R016	9.0	<0.1	<0.1	9.0	45.0
R017	7.9	<0.1	<0.1	7.9	39.3
R018	7.5	<0.1	<0.1	7.5	37.3
R019	7.8	<0.1	<0.1	7.8	38.8
R020	7.8	<0.1	<0.1	7.8	38.8
R021	7.9	<0.1	<0.1	7.9	39.6
R022	8.0	<0.1	<0.1	8.0	39.9

8A.5.48 Table 8A-21 and Table 8A-22 display the relevant information and modelling results for the assessment of construction traffic impacts on ecological sites, this is discussed in Chapter 12: Ecology and Nature Conservation (ES Volume I, EN070009/APP/6.2), Chapter 13: Ornithology (ES Volume I, EN070009/APP/6.2), Chapter 14: Marine Ecology (ES Volume I, EN070009/APP/6.2)) and the Report to Inform Habitats Regulations Assessments (EN070009/APP/5.10). Results for the In-Combination assessment, that forms part of the and the Report to Inform Habitats Regulations Assessments (EN070009/APP/5.10), are presented in Annex B.

Table 8A-21: Dispersion Modelling Results for Ecological Receptors – NOx Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	13.7	0.1	0.3	17.2	57.4
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	13.3	0.2	0.8	28.2	93.8
RE003	Teesmouth and Cleveland Coast SSSI	13.2	0.2	0.8	14.1	47.1
RE004	Charlton's Pond LNR	14.4	<0.1	<0.1	14.6	48.8
RE005	Teesmouth and Cleveland Coast SSSI and SPA	16.2	0.1	0.4	20.6	68.7
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.5	0.2	0.6	21.6	72.2
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.5	0.3	0.9	25.7	85.7
RE008	Teesmouth and Cleveland Coast SSSI and SPA	13.7	0.5	1.5	23.5	78.4
RE009	Teesmouth and Cleveland Coast SSSI and SPA	16.2	<0.1	0.1	16.8	56.0
RE010	Wilton Woods Complex LWS	11.0	<0.1	0.1	18.5	61.7

**Full transect results available in Annex A where "change as % of AQAL" is >1%*

Table 8A-22: Dispersion Modelling Results for Ecological Receptors – Nutrient Nitrogen Deposition (kgN/ha/yr)

RECEPTOR*	SITE NAME	BACKGROUND	CRITICAL LOAD (AQAL)	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	14.24	10	0.01	0.1	14.5	145.0
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	12.42	10	0.02	0.2	13.5	135.1
RE003	Teesmouth and Cleveland Coast SSSI	12.47	10	0.02	0.2	12.5	125.4
RE004	Charlton's Pond LNR	26.54	10	<0.01	<0.1	26.6	265.9
RE005	Teesmouth and Cleveland Coast SSSI and SPA	14.64	10	0.01	0.1	15.0	149.7
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.29	10	0.01	0.1	14.8	148.2
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.29	10	0.02	0.2	15.1	151.1
RE008	Teesmouth and Cleveland Coast SSSI and SPA	14.24	10	0.03	0.3	15.0	149.7
RE009	Teesmouth and Cleveland Coast SSSI and SPA	14.34	10	<0.01	<0.1	14.4	143.8
RE010	Wilton Woods Complex LWS	24.91	10	0.01	0.1	26.1	260.8

**Full transect results available in Annex A where "change as % of AQAL" is >1%*

Decommissioning

8A.5.49 At the end of its design life decommissioning of the Proposed Development will see the removal of all above ground equipment down to ground level and the ground remediated to enable future industrial / commercial re-use. It is assumed that all underground infrastructure will remain in-situ; however, all connection and access points will be sealed or grouted to ensure disconnection. It is considered that the assessment of construction traffic impacts carried out would be comparable with, or less than, the likely impacts associated with traffic impacts associated with Proposed Development decommissioning activities.

Conclusions

8A.5.50 This report has assessed the impact on local air quality of the construction and demolition activities associated with the Proposed Development. The assessment has used a sensitivity assessment methodology to assess the likelihood and scale of impacts on sensitive receptors located in the vicinity of the Proposed Development Site as associated with dust arisings from the construction and demolition activities and associated road traffic.

8A.5.51 The evaluation of expected dust arisings from the proposed construction and demolition works has shown that without mitigation there could be a short-term low to medium impact of dust emissions associated with the construction phase on human health and a potential high impact on the ecological receptors, with a significant effect. However, appropriate mitigation measures for managing these risks will be set out in the Final CEMP(s) which will be in accordance with IAQM guidance. Examples are listed in Section 8.5 of Chapter 8: Air Quality (ES Volume I, EN070009/APP/6.2). Such measures will be formalised through the Final CEMP(s) to be prepared and implemented by the Engineering, Procurement and Construction (EPC) Contractor(s). Through implementation of these mitigation measures, no significant dust effects are predicted on any sensitive receptors.

8A.5.52 The impacts of emissions from construction traffic are likely to result in insignificant effects, given the magnitude of change is considered to be negligible where human receptors are present.

8A.5.53 The significance of the effects on ecological receptors are considered as part of the ecology and nature conservation assessment (see Chapter 12: Ecology and Nature Conservation (ES Volume I, EN070009/APP/6.2), Chapter 13: Ornithology (ES Volume I, EN070009/APP/6.2) and Chapter 14: Marine Ecology (ES Volume I, EN070009/APP/6.2)) and the Report to Inform Habitats Regulations Assessment (EN070009/APP/5.10).

8A.6 References

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- Department for Environment, Food and Rural Affairs (Defra) (2020c). NO_2 Adjustment for NO_X Sector Removal Tool v8.0.
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ANNEX A ADDITIONAL DISPERSION MODELLING RESULTS

Table 8A-23: Dispersion Modelling Results for Ecological Receptor Transects – NOx Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE008_0m	Teesmouth and Cleveland Coast SSSI and SPA	13.7	0.5	1.5%	23.5	78.4%
RE008_10m		13.7	0.2	0.7%	18.6	61.9%
RE008_20m		13.7	0.2	0.5%	17.1	57.0%
RE008_30m		13.7	0.1	0.4%	16.4	54.6%
RE008_40m		13.7	0.1	0.3%	15.9	53.2%
RE008_50m		13.7	0.1	0.3%	15.7	52.2%
RE008_60m		13.7	0.1	0.2%	15.5	51.5%
RE008_70m		13.7	0.1	0.2%	15.3	51.0%
RE008_80m		13.7	0.1	0.2%	15.2	50.6%
RE008_90m		13.7	0.1	0.2%	15.1	50.3%
RE008_100m		13.7	0.1	0.2%	15.0	50.0%
RE008_110m		13.7	<0.1	0.2%	14.9	49.8%
RE008_120m		13.7	<0.1	0.2%	14.9	49.6%
RE008_130m		13.7	<0.1	0.1%	14.8	49.4%
RE008_140m		13.7	<0.1	0.1%	14.8	49.2%
RE008_150m		13.7	<0.1	0.1%	14.7	49.1%
RE008_160m		13.7	<0.1	0.1%	14.7	49.0%
RE008_170m		13.7	<0.1	0.1%	14.7	48.9%
RE008_180m		13.7	<0.1	0.1%	14.6	48.8%
RE008_190m		13.7	<0.1	0.1%	14.6	48.7%
RE008_200m		13.7	<0.1	0.1%	14.6	48.6%

ANNEX B IN COMBINATION MODELLING RESULTS AT ECOLOGICAL RECEPTORS

The in-combination assessment results below have been considered in the Report to Inform Habitats Regulations Assessment (EN070009/APP/5.10) submitted with the Application.

An ‘in combination’ assessment requires an assessment of the effects of the scheme when considered cumulatively with all forecast traffic growth on the road network. This does not normally require the modelling of any additional scenarios beyond those stated, but does require the project ecologist to be mindful of not purely focussing on the impact of the specific road scheme in isolation, but comparing the Do Something scenario with the Future Baseline scenario (which assumes no growth in traffic flow from the base year to the opening year) in order to take full account of the effects of traffic growth without the obscuring effect of improved vehicle emission factors.

Unlike the results presented in Table 8A-21 and Table 8A-22, where committed developments are considered part of the Future Year Without Development scenario, the In-Combination assessment considers them jointly with the Proposed Development scenario. The Future Year Without Development scenario becomes a Future Base – using traffic flows from Base year, but emission factors from future year to separate the effect of reductions in emissions due to the change in vehicle fleet from changes in traffic flow.

Only impacts at internally designated sites are considered in the Habitats Regulations Assessment, therefore only results at these sites are presented in the tables below.

Table 8A-24: Dispersion Modelling Results for Ecological Receptors – NOx Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	FUTURE BASE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	13.7	16.9	0.3	0.9	17.2	57.4
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	13.3	24.9	3.3	11.0	28.2	93.8
RE005	Teesmouth and Cleveland Coast SSSI and SPA	16.2	20.3	0.3	1.2	20.6	68.7
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.5	21.1	0.6	1.9	21.6	72.2
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.5	24.9	0.9	2.9	25.7	85.7
RE008	Teesmouth and Cleveland Coast SSSI and SPA	13.7	23.1	0.5	1.5	23.5	78.4
RE009	Teesmouth and Cleveland Coast SSSI and SPA	16.2	16.8	<0.1	0.1	16.8	56.0

**Full transect results available in Annex A where "change as % of AQAL" is >1%*

Table 8A-25: Dispersion Modelling Results for Ecological Receptors – Nutrient Nitrogen Deposition (kgN/ha/yr)

RECEPTOR*	SITE NAME	BACKGROUND	CRITICAL LOAD (AQAL)	FUTURE BASE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	14.24	10	0.24	0.02	0.2	14.5	145.0
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	12.42	10	0.85	0.24	2.4	13.5	135.1
RE005	Teesmouth and Cleveland Coast SSSI and SPA	14.64	10	0.30	0.03	0.3	15.0	149.7
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.29	10	0.49	0.04	0.4	14.8	148.2
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.29	10	0.76	0.06	0.6	15.1	151.1
RE008	Teesmouth and Cleveland Coast SSSI and SPA	14.24	10	0.69	0.03	0.3	15.0	149.7
RE009	Teesmouth and Cleveland Coast SSSI and SPA	14.34	10	0.04	<0.01	<0.1	14.4	143.8

**Full transect results available in Annex A where "change as % of AQAL" is >1%*

Table 8A-26: Dispersion Modelling results for Ecological Receptor Transects – NOx Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	FUTURE BASE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE002_5m	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	13.3	24.9	3.3	11.0	28.2	93.8
RE002_10m		13.3	21.9	2.5	8.2	24.4	81.2
RE002_15m		13.3	20.2	2.0	6.6	22.2	74.1
RE002_20m		13.3	19.1	1.7	5.6	20.8	69.4
RE002_25m		13.3	18.4	1.5	4.9	19.8	66.1
RE002_35m		13.3	17.3	1.2	3.9	18.5	61.8
RE002_45m		13.3	16.7	1.0	3.3	17.7	59.0
RE002_55m		13.3	16.3	0.9	2.9	17.1	57.1
RE002_65m		13.3	15.9	0.8	2.6	16.7	55.7
RE002_75m		13.3	15.7	0.7	2.4	16.4	54.6
RE002_85m		13.3	15.5	0.7	2.2	16.1	53.8
RE002_95m		13.3	15.3	0.6	2.0	15.9	53.1
RE002_105m		13.3	15.2	0.6	1.9	15.7	52.5
RE002_130m		13.3	14.9	0.5	1.7	15.4	51.4
RE002_155m		13.3	14.7	0.4	1.5	15.2	50.6
RE002_180m		13.3	14.6	0.4	1.4	15.0	49.9
RE002_200m		13.3	14.5	0.4	1.3	14.9	49.6
RE005_31.6m	Teesmouth and Cleveland Coast SSSI and SPA	16.2	20.3	0.3	1.2	20.6	68.7
RE005_40m		16.2	19.6	0.3	1.0	19.9	66.5

RECEPTOR*	SITE NAME	BACKGROUND	FUTURE BASE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE005_50m		16.2	19.1	0.3	0.8	19.4	64.6
RE005_60m		15.2	17.8	0.2	0.7	18.0	60.0
RE005_70m		15.2	17.5	0.2	0.7	17.7	59.0
RE005_80m		15.2	17.3	0.2	0.6	17.5	58.2
RE005_90m		15.2	17.1	0.2	0.5	17.3	57.6
RE005_100m		15.2	17.0	0.1	0.5	17.1	57.1
RE005_110m		15.2	16.9	0.1	0.5	17.0	56.6
RE005_120m		15.2	16.7	0.1	0.4	16.9	56.3
RE005_130m		15.2	16.7	0.1	0.4	16.8	55.9
RE005_140m		15.2	16.6	0.1	0.4	16.7	55.6
RE005_150m		15.2	16.5	0.1	0.4	16.6	55.4
RE005_160m		15.2	16.4	0.1	0.3	16.6	55.2
RE005_170m		15.2	16.4	0.1	0.3	16.5	55.0
RE005_180m		15.2	16.3	0.1	0.3	16.4	54.8
RE005_190m		15.2	16.3	0.1	0.3	16.4	54.6
RE005_200m		15.2	16.3	0.1	0.3	16.3	54.5
RE006_3.15m	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.5	21.1	0.6	1.9	21.6	72.2
RE006_10m		14.5	18.7	0.4	1.2	19.0	63.5
RE006_20m		14.5	17.3	0.2	0.8	17.6	58.6
RE006_30m		14.5	16.7	0.2	0.7	16.9	56.3

RECEPTOR*	SITE NAME	BACKGROUND	FUTURE BASE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE006_40m		14.5	16.3	0.2	0.5	16.5	54.9
RE006_50m		14.5	16.1	0.1	0.5	16.2	54.0
RE006_60m		14.5	15.9	0.1	0.4	16.0	53.4
RE006_70m		14.5	15.8	0.1	0.4	15.9	52.9
RE006_80m		14.5	15.6	0.1	0.4	15.8	52.5
RE006_90m		14.5	15.6	0.1	0.3	15.7	52.2
RE006_100m		14.5	15.5	0.1	0.3	15.6	51.9
RE006_110m		14.5	15.4	0.1	0.3	15.5	51.7
RE006_120m		14.5	15.4	0.1	0.3	15.5	51.5
RE006_130m		14.5	15.3	0.1	0.3	15.4	51.4
RE006_140m		14.5	15.3	0.1	0.2	15.4	51.2
RE006_150m		14.5	15.3	0.1	0.2	15.3	51.1
RE006_160m		14.5	15.2	0.1	0.2	15.3	51.0
RE006_170m		14.5	15.2	0.1	0.2	15.3	50.9
RE006_180m		14.5	15.2	0.1	0.2	15.3	50.8
RE006_190m		14.5	15.2	0.1	0.2	15.2	50.8
RE006_200m		14.5	15.1	0.1	0.2	15.2	50.7
RE007_4.05m	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.5	24.9	0.9	2.9	25.7	85.7
RE007_10m		14.5	21.5	0.6	2.0	22.1	73.8
RE007_20m		14.5	19.2	0.4	1.4	19.6	65.4

RECEPTOR*	SITE NAME	BACKGROUND	FUTURE BASE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE007_30m		14.5	18.1	0.3	1.1	18.4	61.5
RE007_40m		14.5	17.5	0.3	0.9	17.7	59.2
RE007_50m		14.5	17.1	0.2	0.8	17.3	57.6
RE007_60m		14.5	16.7	0.2	0.7	16.9	56.5
RE007_70m		14.5	16.5	0.2	0.6	16.7	55.7
RE007_80m		14.5	16.3	0.2	0.6	16.5	55.0
RE007_90m		14.5	16.2	0.2	0.5	16.3	54.5
RE007_100m		14.5	16.1	0.1	0.5	16.2	54.0
RE007_110m		14.5	16.0	0.1	0.5	16.1	53.6
RE007_120m		14.5	15.9	0.1	0.4	16.0	53.3
RE007_130m		14.5	15.8	0.1	0.4	15.9	53.0
RE007_140m		14.5	15.7	0.1	0.4	15.8	52.8
RE007_150m		14.5	15.7	0.1	0.4	15.8	52.6
RE007_160m		14.5	15.6	0.1	0.4	15.7	52.4
RE007_170m		14.5	15.6	0.1	0.3	15.7	52.2
RE007_180m		14.5	15.5	0.1	0.3	15.6	52.0
RE007_190m		14.5	15.5	0.1	0.3	15.6	51.9
RE007_200m		14.5	15.4	0.1	0.3	15.5	51.8
RE008_0m	Teesmouth and Cleveland Coast SSSI and SPA	13.7	23.1	0.5	1.5	23.5	78.4
RE008_10m		13.7	18.4	0.2	0.7	18.6	61.9

RECEPTOR*	SITE NAME	BACKGROUND	FUTURE BASE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE008_20m		13.7	16.9	0.2	0.5	17.1	57.0
RE008_30m		13.7	16.3	0.1	0.4	16.4	54.6
RE008_40m		13.7	15.9	0.1	0.3	15.9	53.2
RE008_50m		13.7	15.6	0.1	0.3	15.7	52.2
RE008_60m		13.7	15.4	0.1	0.2	15.5	51.5
RE008_70m		13.7	15.2	0.1	0.2	15.3	51.0
RE008_80m		13.7	15.1	0.1	0.2	15.2	50.6
RE008_90m		13.7	15.0	0.1	0.2	15.1	50.3
RE008_100m		13.7	14.9	0.1	0.2	15.0	50.0
RE008_110m		13.7	14.9	0.0	0.2	14.9	49.8
RE008_120m		13.7	14.8	0.0	0.2	14.9	49.6
RE008_130m		13.7	14.8	0.0	0.1	14.8	49.4
RE008_140m		13.7	14.7	0.0	0.1	14.8	49.2
RE008_150m		13.7	14.7	0.0	0.1	14.7	49.1
RE008_160m		13.7	14.7	0.0	0.1	14.7	49.0
RE008_170m		13.7	14.6	0.0	0.1	14.7	48.9
RE008_180m		13.7	14.6	0.0	0.1	14.6	48.8
RE008_190m		13.7	14.6	0.0	0.1	14.6	48.7
RE008_200m		13.7	14.5	0.0	0.1	14.6	48.6

Table 8A-27: Dispersion Modelling Results for Ecological Receptors Transects – Nutrient Nitrogen Deposition (kgN/ha/yr)

RECEPTOR*	SITE NAME	BACKGROUND	CRITICAL LOAD (AQAL)	FUTURE BASELINE	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE002_5m	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	14.24	10	0.85	0.02	0.2	14.5	145.0
RE002_10m		12.42	10	0.64	0.24	2.4	13.5	12.42
RE002_15m		12.42	10	0.52	0.18	1.8	13.2	12.42
RE002_20m		12.42	10	0.44	0.15	1.5	13.1	12.42
RE002_25m		12.42	10	0.38	0.12	1.2	13.0	12.42
RE002_35m		12.42	10	0.30	0.11	1.1	12.9	12.42
RE002_45m		12.42	10	0.26	0.09	0.9	12.8	12.42
RE002_55m		12.42	10	0.22	0.07	0.7	12.8	12.42
RE002_65m		12.42	10	0.20	0.07	0.7	12.7	12.42
RE002_75m		12.42	10	0.18	0.06	0.6	12.7	12.42
RE002_85m		12.42	10	0.16	0.05	0.5	12.7	12.42
RE002_95m		12.42	10	0.15	0.05	0.5	12.6	12.42
RE002_105m		12.42	10	0.14	0.05	0.5	12.6	12.42
RE002_130m		12.42	10	0.12	0.04	0.4	12.6	12.42
RE002_155m		12.42	10	0.11	0.04	0.4	12.6	12.42
RE002_180m		12.42	10	0.10	0.04	0.4	12.6	12.42
RE002_200m		12.42	10	0.09	0.03	0.3	12.5	12.42