RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Preliminary Environmental Information Report

Chapter 26 – Air Quality

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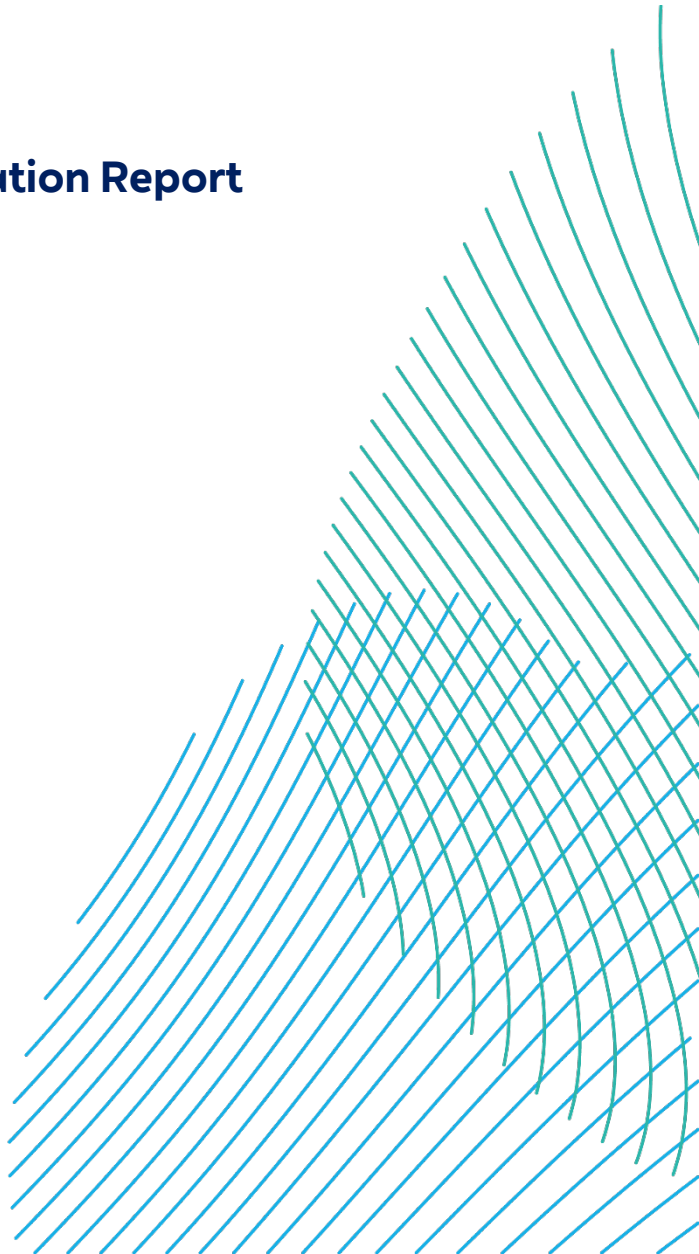

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Glossary

Term	Definition
Dogger Bank South (DBS) Offshore Wind Farms	The collective name for the two Projects, DBS East and DBS West.
Array Cables	Cables which link the wind turbine generators to the offshore substation/converter/collector platform(s).
Construction Compound	Area set aside to facilitate construction. To be located adjacent to the onshore export cable corridor and along the landfall and onshore substations, with access to the highway (locations not yet determined).
EIA Regulations	The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the Environmental Impact Assessment (EIA) and Habitats Regulations Assessment (HRA) for certain topics.
Habitats Regulations	Conservation of Habitats and Species Regulations 2017 and Conservation of Offshore Marine Habitats and Species Regulations 2017.
Haul Road	The track used by traffic to access different sections of the onshore export cable corridor for construction.
Horizontal Directional Drilling (HDD)	HDD is a trenchless technique to bring the offshore cables ashore at the landfall and can be used for crossing other obstacles such as roads, railways and watercourses onshore.
Jointing Bays	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.

Term	Definition
Landfall	The point on the coastline at which the offshore export cables are brought onshore, connecting to the onshore export cables at the Transition Joint Bay.
Offshore Export Cables	The cables which would bring electricity from the offshore substation platform(s) to the landfall.
Onshore Export Cables	Onshore export cables take the electricity from the Transition Joint Bay to the onshore substations.
Onshore grid connection points	The electricity transmission network connection locations for the Projects.
Onshore Substations	A compound containing electrical equipment required to transform and stabilise electricity generated by the Projects so that it can be connected to the electricity transmission network. There will be one onshore substation for each Project.
Onshore Substation Zones	Parcels of land within the Onshore Development Area where the onshore substation infrastructure (including the haul roads, temporary construction compounds and associated cable routeing) may be located.
The Applicant	RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited as the owners of DBS West and DBS East respectively are the named undertakers that will have the benefit of the Development Consent Order. References in this document to obligations on, or commitments by, 'the Applicant' are given on behalf of RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited.
The Projects	DBS East and DBS West (collectively referred to as the Dogger Bank South Offshore Wind Farms)

Term	Definition
Reactive Compensation Platform (RCP)	A Reactive Compensation Platform (RCP) will be required for a HVAC solution. The RCP will host the shunt reactors required to provide reactive compensation, in order to limit the electrical losses which occur with HVAC transmission over long distances.
Safety Zones	A statutory marine zone demarcated for the purposes of safety around a possibly hazardous installation or works/construction area.
Scour Protection	Protective materials to avoid sediment erosion from the base of the wind turbine foundations and offshore platform foundations due to water flow.
Transition Joint Bay (TJB)	The Transition Joint Bay (TJB) is an underground structure at the landfall that houses the joints between the offshore export cables and the onshore export cables.
Transmission Infrastructure	The structures and equipment required to convey electricity.

Acronyms

Term	Definition
AADT	Annual Average Daily Traffic
ADMS-Roads	Atmospheric Dispersion Modelling System for Roads
APIS	Air Pollution Information System
AQMA	Air Quality Management Area
ARN	Affected Road Network
ASR	Annual Status Report
CAS	Clean Air Strategy
CBS	Cement Bound Sand
CEA	Cumulative Effects Assessment
CEH	Centre for Ecology and Hydrology
CLRTAP	Convention on Long-range Transboundary Air Pollution
CoCP	Code of Construction Practice
CO_2	Carbon Dioxide
CTMP	Construction Traffic Management Plan
DBS	Dogger Bank South
DCO	Development Consent Order
DEFRA	Department for the Environment and Rural Affairs
DECC	Department of Energy and Climate Change
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges

Term	Definition
DMT	Decision-making Threshold
EFT	Emission Factor Toolkit
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EIA	Environmental Impact Assessment
EPP	Evidence Plan Process
EPUK	Environmental Protection United Kingdom
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement
ETG	Expert Topic Group
EU	European Union
HCC	Hull City Council
HDD	Horizontal Directional Drilling
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicles
HVAC	High-Voltage Alternating Current
HVDC	High-Voltage Direct Current
IAQM	Institute of Air Quality Management
IPC	Infrastructure Planning Commission (now Planning Inspectorate)
IPMP	In-Principal Monitoring Plan

Term	Definition
IRZ	Impact Risk Zone
JNCC	Joint Nature Conservation Committee
km	Kilometre
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles
LNR	Local Nature Reserve
LPA	Local Planning Authority
MAGIC	Multi-Agency Geographic Information for the Countryside
MHCLG	Ministry of Housing, Communities and Local Government (now the Department for Levelling Up, Housing and Communities)
MW	Megawatts
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NPS	National Policy Statement
NRMM	Non-Road Mobile Machinery
NSIPs	Nationally Significant Infrastructure Projects
OCoCP	Outline Code of Construction Practice
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
PM	Particulate Matter

Term	Definition
PPG	Planning Practice Guidance
RHDHV	Royal HaskoningDHV
RMSE	Root Mean Square Error
SAC	Special Area of Conservation
SPA	Special Protection Area
SPD	Supplementary Planning Guidance
SSSI	Site of Special Scientific Interest
TJB	Transition Joint Bay
UNECE	United Nations Economic Commission for Europe
UK	United Kingdom

26 Air Quality

26.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) considers the likely significant effects of the Projects on local air quality. The chapter provides an overview of the existing environment for the proposed Onshore Development Area, followed by an assessment of likely significant effects for the construction, operation, and decommissioning phases of the Projects.

2. As stated in the Scoping Opinion (the Planning Inspectorate, 2022), the Planning Inspectorate has agreed to scope out the 'Offshore Air Quality' impacts as the effects are unlikely to be significant. Therefore, this element does not form part of this assessment. Upon further consultation with the respective local authorities (see **Table 26-1**), it has been agreed that the 'Operational Impacts' on air quality are unlikely to be significant and are therefore also scoped out of the assessment

3. The assessment should be read in conjunction with the following linked chapters:

   - **Chapter 9 Benthic Habitats**;
   - **Chapter 18 Terrestrial Ecology and Ornithology**;
   - **Chapter 24 Traffic and Transport**;
   - **Chapter 27 Human Health**; and
   - **Chapter 30 Climate Change**.

4. Additional information to support the air quality assessment includes:

   - **Appendix 26.1 Construction Dust and Particulate Matter Assessment**;
   - **Appendix 26.2 Air Quality Assessment Traffic Data**; and
   - **Appendix 26.3 Construction Road Traffic Emissions Assessment – Receptor Locations**.

26.2 Consultation

5. Consultation with regard to air quality has been undertaken in line with the general process described in **Chapter 6 EIA Methodology.** The key elements of consultation to date have included scoping and the ongoing Evidence Plan Process (EPP) via the Dogger Bank South Traffic and Access, Onshore Noise and Air Quality Expert Topic Group (ETG). The feedback received has been considered in preparing the PEIR. **Table 26-1** provides a summary of how the consultation responses received to date have influenced the approach that has been taken.

6. This chapter will be updated following consultation on PEIR in order to produce the final assessment that will be submitted with the Development Consent Order (DCO) application. Full details of the consultation process will also be presented in the Consultation Report alongside the DCO application.

Table 26-1 Consultation Responses

Comment	Project Response
East Riding of Yorkshire Council (Environmental Control) / Dogger Bank South Traffic and Access, Onshore Noise and Air Quality Expert Topic Group – Pre-Scoping 14/09/2021	
No concerns or issues have been raised regarding the information or approach presented to stakeholders.	The Applicant presented the proposed scoped in and out air quality impacts, to be presented in the Scoping Report.
Planning Inspectorate / Scoping Opinion: Proposed Dogger Bank South Offshore Wind Farms; Scoping Responses 02/09/2022	
Offshore Air Quality: The Scoping Report states that the main source of emissions is likely to be from vessels used during construction, operation, and decommissioning emitting nitrogen oxides (NOx), particulate matter (PM) and sulphur dioxide (SO_2). It is stated that vessels operating in the North Sea area are required to comply with Emission Control Area restrictions under Annex VI of the MARPOL Convention[1] in respect of NOx and SO_2 limits. It is stated that in the context of existing vessel traffic in the North Sea, the	Noted. Offshore air quality impacts have been scoped out of the assessment.

[1] International Convention for the Prevention of Pollution from Ships

Comment	Project Response
contribution would be small, although no data is presented in terms of the baseline position or likely number of vessel movements as a result of the Proposed Development. It is also stated that vessel movements would be carried out at some distance from the shore and are therefore unlikely to impact on land based human and ecological receptors, although no information is presented as to the likely routes of vessel movements. The Inspectorate agrees that this matter may be scoped out of the ES on the basis that the main source of emissions would be exhaust emissions from vessels, and due to the nature and location of the offshore components of the Proposed Development associated vessel movements would only generate a small increase in emissions in all phases, which is unlikely to result in significant effects to land based human and ecological receptors.	
Cumulative effects: As no pathway for effects has been identified, the Proposed Projects are not expected to contribute to cumulative effects with other offshore emission sources. The Inspectorate agrees that cumulative effects on offshore air quality can be scoped out of the assessment.	Noted. Cumulative effects on offshore air quality have been scoped out of the assessment.
Operational Impacts: The Inspectorate has considered the information in the Scoping Report and agrees that significant effects are unlikely. However, the information on the likely emissions to air during operation and the receptors which could be affected is very limited. The Inspectorate considers that back-up generators, and other equipment in particular battery storage infrastructure if proposed, has the potential to result in air quality effects during the operational phase. The Inspectorate would expect the ES to provide a reasoned justification supported by evidence to demonstrate why a detailed assessment is not required. Cross-reference should be made to the	Noted. It has been agreed with stakeholders as part of the EPP via the Dogger Bank South Traffic and Access, Onshore Noise and Air Quality Expert ETG workshops that operational dust, NRMM and traffic emissions can be scoped out as significant effects are unlikely. Details of the number and capacity of back-up generators are not yet known, however, any local air quality impact is very unlikely to be significant. Given

Comment	Project Response
assessments of effects on ecology and on human health.	their purpose, such plant operate very infrequently, although need to be regularly tested, but typically this is for a short time, on a periodic basis, such as weekly or monthly. Generators which have a thermal input rating greater than 1MWth will require an operational Environmental Permit. Emergency standby generators which are tested <50 hours/year are exempt from the 'Specified Generator' requirements, but they are still classed as 'Medium Combustion Plants'. The new units would be considered in aggregate capacity, according to the rated thermal input not electrical output. Depending on various factors including the location, a Standard Rules Permit may be available. The Applicant will apply for and have in place the requisite Permit(s) for its back-up power provision at the appropriate time. The design of the Projects does not include Battery Energy Storage Systems (BESS).
Affected Road Network: The ES should explain how the affected road network (ARN) has been identified and provide a clear definition of the ARN including appropriate figures where possible.	Noted. The affected road network is defined in section 26.3.1 and the air quality study area is presented in **Figure 26-1**.
Principal Officer, East Riding of Yorkshire Council, 09 December 2022/ Detailed Proposed Methodology Sent via Email	

Comment	Project Response
The Principal Officer had no issues with the proposed scope of the air quality assessment.	The methodology agreed with the Environmental Protection Officer at East Riding of Yorkshire Council has been used within this air quality assessment.
David White, Air Quality Officer, Hull City Council /13 December 2022/ Detailed Proposed Methodology Sent via Email	
For the traffic impacts, the EPUK and IAQM Guidance is not appropriate for Hull, and we require Air Quality to be assessed using the guidance in Appendix E of SPD3 of the Local Plan. This can be accessed via the following link. https://www.hull.gov.uk/environment/pollution/air-quality One of the main differences is the assessment of significance, which in Hull relates to the change from the monitored concentrations rather than a comparison to the air quality objectives and includes the whole of the area rather than focussing on the AQMA. I would also draw your attention to the concerns raised by the Highways Department relating to key junctions and the potential for issues around them. These are also of concern from an air quality perspective and will require specific assessments at these key points. These junctions could influence which local monitoring sites are appropriate for use in model validation rather than background sites or maps. It should also be noted that there are other applications that are liable to coincide with this proposal, and the considerations given to those should also be identified in the proposed air quality assessment.	Noted. The assessment presented in this chapter has been undertaken in accordance with the Hull Air Quality Guidance SPD3. During consultation with the Highways Department, traffic data were not available in sufficient detail to allow the Highway Department to determine the key junctions of concern. Assessment of key junctions within the study area, as defined by the Highways Department, will be included in the ES. A preliminary Cumulative Effects Assessment (CEA) is provided in section 26.7. A final CEA will be provided in the ES.

26.3 Scope

26.3.1 Study Area

7. The air quality study area has been defined on the basis of the Planning Inspectorate's Scoping Opinion (the Planning Inspectorate, 2022), through consultation with East Riding of Yorkshire Council and Hull City Council (see **Table 26-1)** and using the criteria detailed below. As noted in **Table 26-1**, offshore and operational air quality impacts are scoped out of the assessment, as they are unlikely to be significant.

8. During construction, the onshore elements of the Projects may give rise to construction phase dust and fine particulate matter, Non-Road Mobile Machinery (NRMM) emissions and road traffic emissions. These aspects have been assessed and presented in the chapter.

9. The Onshore Development Area is defined as the possible landfall location at Skipsea, the onshore export cable corridor, and the onshore substation zones, including access requirements.

10. The air quality study area is shown in **Figure 26-1** and has been defined as follows:

- Construction phase dust and fine particulate matter emissions:
  - Human receptors within 350m of the Onshore Development Area and within 50m of routes used by construction vehicles (for routes used by construction-generated traffic up to 500m from the Onshore Development Area); and
  - Ecological receptors within 200m of the Onshore Development Area and within 50m of routes used by construction vehicles (for routes used by construction-generated traffic up to 500m from the Onshore Development Area).
- Construction phase NRMM emissions:
  - Human and ecological receptors within 200m of the Onshore Development Area where NRMM will be located.
- Construction phase road traffic emissions:
  - Human and ecological receptors within 200m of all roads that trigger the traffic screening criteria and adjoining roads within 200 m, referred to as the Affected Road Network (ARN). Further information on construction traffic routes is provided in **Chapter 24 Traffic and Transport**.

26.3.2 Realistic Worst Case Scenario

26.3.2.1 General Approach

11. The realistic worst case design parameters for likely significant effects scoped into the EIA for the air quality assessment are summarised in **Table 26-2**. These are based on the project parameters described in **Chapter 5 Project Description**, which provides further details regarding specific activities and their durations.

12. In addition to the design parameters set out in **Table 26-2,** consideration is also given to how the Projects will be built out as described in section 26.3.2.2 to section 26.3.2.5**.** This accounts for the fact that whilst the Projects are the subject of one DCO application, it is possible that either one or both of the projects will be developed, and if both are developed, that construction may be undertaken either concurrently or sequentially. Further details are provided in **Chapter 5 Project Description**.

Table 26-2 Realistic Worst Case Design Parameters

Impacts	Parameter			
	DBS East or DBS West in isolation	**DBS East and DBS West concurrently**	**DBS East and DBS West sequentially**	**Notes and rationale**
Construction				
Impacts relating to landfall	• HDD horizontal length: 1400m • Maximum number of HDD: 5 (4x HVAC plus 1x spare) with one rig used during HDD works • HDD compound works area: 230 x 75m • No. of transition joint bays: 4 (4x HVAC) • Total construction land take for TJBs: 1,200m^2 • Duration: 18 months • Temporary access: Route from the existing road system	• HDD horizontal length: 1400m • Maximum number of HDDs: 9 (2 spare) with two rigs used concurrently during HDD works • HDD compound area: 310 x 75m • Number of transition joint bays: 6 (4x HVAC and 2x HVDC) • Total construction land take for TJBs: 1,800m^2 • Duration: 18 months • Temporary access: Route from the existing road system	• HDD horizontal length: 1400m • Maximum number of HDDs: 9 (2 spare) with one rig used sequentially during HDD works • HDD compound area: 310 x 75m • Number of transition joint bays: 6 (4x HVAC and 2x HVDC) • Total construction land take for TJBs: 1,800m^2 • Duration: 42 months Temporary access: Route from the existing road system	HDD and cable pull construction compound considered as one compound installed for duration of construction. The HDD works should not require any prolonged periods of restrictions or closures to the beach for public access, although it is possible that some work activities will be required to be performed on the beach that may require short periods of restricted access.

Impacts relating to the onshore export cable corridor	• Working width: 50m (up to 125m at trenchless crossings)
	• Corridor length: 39km
	• Maximum cable burial depth (where restrictions aren't present): 2m
	• Indicative cable burial depth: 1.6m
	• Access routes: Various from public highway to single tracks
	• Haul road: 7m (increasing to 11m at passing places)
	• Main construction compound: 100 x 100m
	• Secondary construction compounds: 75 x 75m
	• No. of compounds (est.):
	  ○ Main compounds – 2
	  ○ Minor compounds – 15 (for routes to Zone 1)
	  ○ HDD compounds – 70
	  ○ Substation compound: 1
		• Working width: 100m (up to 250m at trenchless crossings)
		• Corridor length: 39km
		• Maximum cable burial depth (where restrictions aren't present): 2m
		• Indicative cable burial depth: 1.6m
		• Access routes: Various from public highway to single tracks
		• Haul road: 7m (increasing to 11m at passing places)
		• Main construction compound: 100 x 100m
		• Secondary construction compounds: 75 x 75m
		• No. of compounds (est.):
		  ○ Main compounds – 2 per Project (4 in total)
		  ○ Minor compounds – 30
		  ○ HDD compounds – 70 per project
			• Working width: 100m (up to 250m at trenchless crossings)
			• Corridor length: 39km
			• Maximum cable burial depth (where restrictions aren't present): 2m
			• Indicative cable burial depth: 1.6m
			• Access routes: Various from public highway to single tracks
			• Haul road: 7m (increasing to 11m at passing places)
			• Main construction compound: 100 x 100m
			• Secondary construction compounds: 75 x 75m
			• No. of compounds (est.):
			  ○ Main compounds – 2 per Project (4 in total)
			  ○ Minor compounds – 30
			  ○ HDD compounds – 70 per project
				Deeper burial depth may be required if open cut crossing of obstacle such as utility / watercourse / road etc.
				In isolation case has a scaled compound work width based on the number of TJB. 50m spacing between HDDs, allowance for a space and 15m either side.

Impacts	Parameter			
	DBS East or DBS West in isolation	**DBS East and DBS West concurrently**	**DBS East and DBS West sequentially**	**Notes and rationale**
	• Trenchless crossing compound dimensions: 50 x 50m assumed for the Project's compounds on each side of the obstacle. • No. of trenchless crossing: 35 • Duration: 33 months	○ Substation compound: 1 per Project • Trenchless crossing compound dimensions: 50 x 50m assumed for the Project's compounds on each side of the obstacle. • No. of trenchless crossing: 35 • Duration: 33 months	○ Substation compound: 1 per Project • Trenchless crossing compound dimensions: 50 x 50m assumed for the Project's compounds on each side of the obstacle. • No. of trenchless crossing: 35 • Duration: 57 months	
Impacts relating to the onshore substations	• Permanent area: 135,000m^2 (based on one HVAC substation) • Total construction area: 180,000m^2 (based on one HVAC substation + temporary construction compound) • Duration: 4 years balanc	• Permanent area: 199,416m^2 (based on one HVAC substation + one HVDC substation) • Total construction area: 274,416m^2 (based on one HVAC substation + temporary construction compound, and one HVDC substation + temporary construction compound) • Duration: 4 years	• Permanent area: 199,416m^2 (based on one HVAC substation + one HVDC substation) • Total construction area: 274,416m^2 (based on one HVAC substation + temporary construction compound, and one HVDC substation + temporary construction compound) • Duration: 6 years	
Impacts relating to construction traffic	DBS East or DBS West in isolation was assessed. The realistic worst case scenario upon which these flows were derived is set out in **Chapter 24 Traffic and Transport** and presented in **Appendix 26.2**.	DBS East and DBS West together concurrently construction traffic was assessed as a worst case scenario for air quality. The realistic worst case scenario upon which these flows were derived is set out in **Chapter 24 Traffic and Transport** and presented in **Appendix 26.2**.		
Operation Scoped out of assessment				
Decommissioning				
No final decision regarding the final decommissioning policy for the onshore project infrastructure including landfall, onshore cable route and onshore substation has yet been made. It is also recognised that legislation and industry best practice change over time. However, it is likely that the onshore project equipment, including the cable, will be removed, reused or recycled wherever possible and the transition bays and cable ducts being left in place. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator. It is anticipated that for the worst case scenario, the impacts will be no greater than those identified for the construction phase.			

26.3.2.2 Development Scenarios

13. There are currently two possible electrical solutions being considered for DBS West, HVAC or HVDC. Due to the distance of the array area offshore DBS East will be an HVDC project. Therefore, there are two possible electrical solutions for the Projects:

- One HVDC project and one HVAC project; or
- Two HVDC projects.

14. There are different parameters required for the onshore substations depending on which electrical solution is selected. Therefore, there are four possible development scenarios within the onshore substation zones that could be taken forward:

- Two HVDC substations in Substation Zone 4;
- One HVDC substation in Substation Zone 1 and one HVAC substation in Substation Zone 4;
- One HVDC substation in Substation Zone 4 and one HVAC substation in Substation Zone 1; or
- One HVDC substation in Substation Zone 1 and one HVDC substation in Substation Zone 4.

15. In order to ensure that a robust assessment has been undertaken, all development scenarios and options have been considered to ensure the realistic worst case scenario for each topic has been assessed. Further details are provided in **Chapter 5 Project Description**.

26.3.2.3 Construction Scenarios

16. The following principles set out the framework for how the Projects may be constructed (relating to both onshore and offshore works):

- DBS East and DBS West may be constructed at the same time, or at different times;
- If built concurrently, both Projects could be constructed in five years;
- If built non-concurrently, either Project could be built first;
- If built non-concurrently, each Project would require a five year period of construction;
- If built non-concurrently, it is anticipated that there would be up to a two year lag between the start of construction for the first project and the start of construction for the second project; and
- Assuming a maximum construction period per Project of five years, and taking the above into account, the maximum construction period over which the construction of both Projects could take place is seven years.

17. In order to determine which construction scenario presents the realistic worst case for each receptor and impact, the assessment considers both maximum duration effects and maximum peak effects, in addition to each Project being developed in isolation, drawing out any differences between each of the two Projects.

18. The three construction scenarios considered by the air quality assessment are therefore:

- Build DBS East or build DBS West in isolation ;
- Build DBS East and DBS West concurrently – reflecting the maximum peak effects; and
- Build the Projects sequentially with a lag of up to two years – reflecting the maximum duration of effects.

19. The individual, concurrent and sequential construction scenarios all allow for flexibility to build out the Projects using a phased approach. This will allow the Projects to adapt to National Grid Electricity Transmission Operator's development plans for the onshore grid connection points. Under a phases approach the maximum timescales for individual elements of the construction have been assessed.

20. Any differences between the Projects, or differences that could result from the manner in which the first and the second Projects are built (concurrent or sequential and the length of any gap) are identified and discussed where relevant in section 26.6. For each potential impact, only the worst case construction scenario for two Projects is presented, i.e. either concurrent or sequential. The justification for what constitutes the worst case is provided, where necessary, in Section 26.6.

21. The Projects' construction-generated road traffic flows have been determined for the worst case scenario which is DBS East and DBS West concurrent construction (see **Chapter 24 Traffic and Transport**). It is anticipated that the magnitude of impacts of the sequential scenario would be no greater, or less than concurrent (as the sequential scenario-generated construction traffic flows would be lower) and therefore have not been considered further in the assessment. Construction generated traffic impacts for the scenario DBS East or DBS West in isolation have been considered in this chapter.

26.3.2.4 Operation Scenarios

22. Operational phase air quality impacts have been scoped out of the assessment, as detailed in the Scoping Report (RWE, 2022), Scoping Opinion (the Planning Inspectorate, 2022) and **Table 26-1**.

26.3.2.5 Decommissioning Scenarios

23. Decommissioning scenarios are described in **Chapter 5 Project Description**. Decommissioning arrangements will be agreed through the submission of a Decommissioning Programme prior to construction, however for the purpose of this assessment it is assumed that decommissioning of the Projects could be conducted separately, or at the same time.

26.3.3 Mitigation Embedded in the Design

24. This section outlines the embedded mitigation relevant to the air quality assessment, which has been incorporated into the design of the Projects (**Table 26-3**). Where other mitigation measures are proposed, these are detailed in the impact assessment (section 26.6).

Table 26-3 Embedded Mitigation Measures

Parameter	Mitigation Measures Embedded into the Project Design
Site selection	The Projects have undergone an extensive site selection process which has involved incorporating environmental considerations in collaboration with the engineering design requirements. Considerations include (but are not limited to) adhering to the Horlock Rules (for explanation see **Chapter 4 Site Selection and Assessment of Alternatives**) for the onshore substations and associated infrastructure. Key principles that have informed the location of the onshore export cable corridor include: • Preference for the shortest onshore export cable corridor, where possible, to minimise the overall footprint and the number of receptors that will be affected; • Avoid key constraints, where possible; and • Avoid populated areas, where possible. • Avoid sites designated for nature conservation, where possible.

Parameter	Mitigation Measures Embedded into the Project Design
NRMM	The following mitigation measures specific to NRMM will be outlined within the Project's Outline Code of Construction Practice (OCoCP) which will be available as part of the statutory consultation and will be secured within the final CoCP submitted post-consent. NRMM and plant should be well maintained. If any emissions of dark smoke occur, then the relevant machinery should stop immediately, and any problem rectified. In addition, the following controls should apply to NRMM: • All NRMM should use fuel equivalent to ultralow sulphur diesel (fuel meeting the specification within EN590:2004) where practicable; • All NRMM should comply with the appropriate NRMM regulations; • All NRMM would be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting); • The ongoing conformity of plant retrofitted with DPF, to a defined performance standard, should be ensured through a programme of onsite checks; and • Fuel conservation measures should be implemented, including instructions to (i) throttle down or switch off idle construction equipment; (ii) switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded and (iii) ensure equipment is properly maintained to ensure efficient fuel consumption. Consideration should also be given to the siting of NRMM within the working area. Where practicable, locating generators and plant at the greatest distance from receptors will reduce the potential for air quality effects.

26.4 Assessment Methodology

26.4.1 Policy, Legislation and Guidance

26.4.1.1 National Policy Statements

25. The assessment of likely significant effects upon air quality has been made with specific reference to the relevant National Policy Statements (NPS). These are the principal decision-making documents for Nationally Significant Infrastructure Projects (NSIPs). Those relevant to the Projects are:

- Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) 2011a);
- NPS for Renewable Energy Infrastructure (EN-3) (DECC 2011b);
- NPS for Electricity Networks Infrastructure (EN-5) (DECC 2011c);
- Draft Overarching NPS for Energy (EN-1) (DECC 2022a);
- Draft NPS for Renewable Energy Infrastructure (EN-3) (DECC 2022b); and
- Draft NPS for Electricity Networks Infrastructure (EN-5) (DECC 2022c).

26. The specific assessment requirements for air quality, as detailed in the NPS, are summarised in **Table 26-4** together with an indication of the section of this chapter where each is addressed.

27. EN-3 and EN-5 (current or draft versions) do not include specific details on the assessment of air quality.

28. Following the consultation in 2021 on the draft energy NPS, a new consultation opened on the 30th March 2023 on revised drafts of the energy NPSs, including EN1, EN3 and EN5. Due to the timing of this consultation, and finalisation of this PEIR we have been unable to review and take these revised draft NPS into account within these documents. However, these will be reviewed and incorporated into the final ES where relevant

Table 26-4 NPS Assessment Requirements

NPS Requirement	NPS Reference	PEIR Section Reference
EN-1 NPS for Energy and Draft EN-1 NPS for Energy		
Any ES on air emissions will include an assessment of Carbon Dioxide (CO_2) emissions, but the policies set out in Section 2 [of EN-1], including the EU ETS, apply to these emissions. The IPC (now Planning Inspectorate) does not, therefore need to assess individual applications in terms of carbon emissions against carbon budgets.	EN-1, Paragraph 5.2.2	Not applicable to this assessment. The greenhouse gas assessment is presented in **Chapter 30 Climate Change.**
The ES should describe: • Any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project; • The predicted absolute emission levels of the proposed project, after mitigation methods have been applied; • Existing air quality levels and the relative change in air quality from existing levels; and • Any potential eutrophication impacts.	EN-1, Paragraph 5.2.7 Draft EN-1, paragraph 5.2.6	Please refer to sections 26.5 and 26.6.
Other matters that the IPC may consider important and relevant to its decision-making may include Development Plan Documents or other documents in the Local Development Framework. In the event of a conflict between these or any other documents and an NPS, the NPS prevails for the purposes of IPC decision making given the national significance of the infrastructure.	EN-1, Paragraph 4.1.5 Draft EN-1, Paragraph 4.1.5	Please refer to section 26.4.1.2.

26.4.1.2 Other Legislation, Policy and Guidance

29. In addition to the NPS, there a number of pieces of legislation, policy and guidance applicable to the assessment of air quality.

26.4.1.2.1 National Legislation

30. EU legislation forms the basis for UK air quality policy. Air quality limit values are outlined in the EU Directive on Ambient Air Quality (1996) and Cleaner Air for Europe Directive 2008/50/EC and in the Air Quality Standards Regulations 2010. The relevant air quality limit values for this assessment for the protection of human health are detailed further in the following sections and are presented in **Table 26-5.**

26.4.1.2.2 Air Quality Strategy

31. The EU Air Quality Framework Directive 96/62/EC on Ambient Air Quality Assessment and Management entered into force in November 1996. This was a framework for tackling air quality through setting European wide air quality limit values in a series of Daughter Directives, prescribing how air quality should be assessed and managed by the Member States. Directive 96/62/EC and the first three Daughter Directives were combined to form the new EU Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe, which came into force June 2008.

32. The 1995 Environment Act 1995 required the preparation of a national Air Quality Strategy (AQS) which set air quality standards and Objectives for specified pollutants. The Act also outlined measures to be taken by local planning authorities in relation to meeting these standards and Objectives (the Local Air Quality Management (LAQM) system).

33. The UK AQS was originally adopted in 1997 and has been reviewed and updated in order to take account of the evolving EU Legislation, technical and policy developments and the latest information on health effects of air pollution. The strategy was revised and reissued in 2000 as the AQS for England, Scotland, Wales and Northern Ireland. This was subsequently amended in 2003 and was last updated in July 2007.

34. The UK Government published its Clean Air Strategy (CAS) in January 2019, which reset the focus for the first time since the 2007 Air Quality Strategy revision. The CAS identifies a series of 'new' air quality issues, including biomass combustion, shipping emissions, and releases from agricultural activities. There is a recognition that the effects of pollutant deposition on sensitive ecosystems and habitats needs greater focus. The concept of an overall exposure reduction approach is raised, in recognition that numerical standards are not safe dividing lines between a risk and a safe exposure, within a population with a varying age and health profile. Within the CAS, the government proposes an ambitious target to reduce the population exposed to concentrations of $PM_{2.5}$ above $10\mu g.m^{-3}$ by 50% by 2025. The CAS is supplemented by an Industrial Strategy, policy guidance for the ports sector, a developing approach for aviation, and by plans for road transport fuels shift to zero emissions by 2040.

35. The Environment Act 2021 gained royal assent in November 2021. The Act requires the government to set targets on air quality, including for fine particulate matter, in order to deliver cleaner air for all. The Act introduced a legally binding duty on the government to bring forward at least two air quality targets by October 2022: one to reduce annual average $PM_{2.5}$ concentrations in ambient air and the second must be a long-term target (set a minimum of 15 years in the future) in order to encourage long-term investment and to provide certainty for businesses and other stakeholders. A public consultation on the proposed targets closed in June 2022.

36. The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 sets two $PM_{2.5}$ targets into law and contains provisions on how they will be monitored and assessed. The targets are as follows::

- An Annual Mean Concentration Target – limiting $PM_{2.5}$ to 10 $\mu g\ m^{-3}$, to be met across England by the end of 2040.
- A Population Exposure Reduction Target – a 35% reduction in population exposure to $PM_{2.5}$ by the end of 2040.

37. The new Environmental Improvement Plan was published in January 2023 and includes non-statutory interim $PM_{2.5}$ targets of five years in duration as milestones to meeting the full long-term targets.

26.4.1.2.3 Local Air Quality Management (LAQM)

38. The standards and Objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations 2000; the Air Quality Standards Regulations 2010 set out the combined Daughter Directive limit values and interim targets for Member State compliance.

39. The current air quality standards and Objectives (for the purpose of LAQM) of relevance to this assessment are outlined in **Table 26-5.** Pollutant standards relate to ambient pollutant concentrations in air, set based on medical and scientific evidence of how each pollutant affects human health. Pollutant Objectives however incorporate future dates by which each standard is to be achieved, taking into account economic considerations, practicability and technical feasibility.

40. The pollutants of concern in the context of the air quality assessment are NO_2 and PM_{10} and $PM_{2.5}$, as these pollutants are most likely to be present in ambient air at concentrations close to or above the air quality criteria at sensitive receptors near to roads and are hence the focus of the assessment of vehicle emissions associated with the Projects. Air quality thresholds relevant to the air quality assessment are summarised in **Table 26-5.**

Table 26-5 Air Quality Strategy Objectives (England) for the Purpose of LAQM

Pollutant	Air Quality Objective		To be achieved by
	Concentration (µg m^{-3})	Measured as*	
Nitrogen dioxide (NO_2)	200	1-hour mean not to be exceeded more than 18 times per year	31/12/2005
	40	Annual mean	31/12/2005
Particles (PM_{10})	50	24-hour mean not to be exceeded more than 35 times per year	31/12/2004
	40	Annual mean	31/12/2004
Particles ($PM_{2.5}$)	25 (10**)	Annual mean (target)	2020 (2040**)
	15% cut in annual mean (urban background exposure)	Annual mean	2010-2020
	35%** cut in annual mean (urban background exposure)	Annual mean	2040

*The way the Objectives are to be measured is set out in the UK Air Quality (England) Regulations 2000

** New environmental targets required by section 1 of the Environment Act 2021(Defra, 2022a) to be adopted in January 20203 though still unpublished at the time of writing the report.

41. It should be noted that the air quality Objectives only apply in locations likely to have 'relevant exposure', i.e., where members of the public are exposed for periods equal to or exceeding the averaging periods set for the standards. For this assessment, locations of relevant exposure include building facades of residential properties, and where relevant schools and medical facilities. Places of work are not included. The Environment Act 2021 is expected to deliver key aspects of the CAS with the aim of maximising health benefits for all and will sit alongside the wider action on air quality.

26.4.1.2.4 Critical Levels for the Protection of Vegetation and Ecosystems

42. National air quality Objectives also apply for the protection of vegetation and ecosystems, which are termed Critical Levels. Critical Levels apply irrespective of habitat type and are based on the concentration of the relevant pollutants in air.

43. The Critical Levels of relevance to this assessment relate to concentrations of NOx and ammonia (NH_3) and are detailed in **Table 26-6**. The Critical Level for ammonia is not included within the Air Quality Standards Regulations; however, a Critical Level for this pollutant is set out within the United Nations Economic Commission for Europe (UNECE) Convention on Long-range Transboundary Air Pollution (CLRTAP) and is adopted within air quality assessments.

44. NOx Critical Levels are provided as both long and short-term averaging periods. IAQM guidance (IAQM, 2020) recommends that only the annual mean NOx Critical Level is used in assessments due to the comparative importance of annual effects upon vegetation, except where specifically required by the regulator where high short-term emissions may occur, such as from an industrial stack emission source. As such, given the consistent traffic exhaust emission source along road links, only the annual mean Critical Level was considered.

Table 26-6 Critical Levels for the Protection of Vegetation and Ecosystems

Pollutant	Concentration (μg m^{-3})	Measured as	To be achieved by
Oxides of Nitrogen (NOx)	30	Annual mean	31/12/2000
Ammonia (NH_3)	3	Annual mean	-
	1 (for lichens and bryophytes)	Annual mean	-

45. Critical Loads for habitat sites in the UK are published on the APIS website (CEH, 2023) and are habitat specific. These are the maximum levels of nutrient nitrogen and acid deposition that can be tolerated without harm to the most sensitive features of these habitat sites. An increase in Critical Load of less than 1% is typically considered to be insignificant, as a change in this level is within the magnitude of natural fluctuation and is unlikely to be measurable. The 1% threshold of insignificance is referenced in guidance provided by Natural England (2018), IAQM (2020) and Chapman and Kite (2021a, 2021b).

26.4.1.2.5 Local Policy

46. The East Riding Local Plan Strategy Document (East Riding of Yorkshire Council, 2016) was adopted in April 2016 and sets out the management of growth and development in the region until 2029. Hull City Council adopted its Local Plan (Hull City Council, 2017) in November 2017, which guides development in the city until 2032. The Local Plan Strategy Document was reviewed, and the policy summarised in **Table 26-7** was identified with regard to air quality and health and the Projects.

Table 26-7 Summary of Local Planning Policy on Decision Making Relevant to Air Quality

Summary of Local Planning Policy	**How and where considered in the PEIR**
East Riding of Yorkshire Council	
"Policy EC5: Supporting the energy sector *A. Proposals for the development of the energy sector, excluding wind energy but including the other types of development listed in Table 7, will be supported where any significant adverse impacts are addressed satisfactorily, and the residual harm is outweighed by the wider benefits of the proposal. Developments and their associated infrastructure should be acceptable in terms of:* *1. The cumulative impact of the proposal with other existing and proposed energy sector developments;* *[...]* *3. The effects of development on:* *i. local amenity, including noise, air and water quality, traffic, vibration, dust and visual impact;*	The impact of construction-generated traffic from the Projects was assessed at both human and ecological receptors as presented in section 26.6.1.3. Cumulative effects have been considered as described in section 26.4.4. Decommissioning effects have been considered as detailed in section 26.6.3.

Summary of Local Planning Policy	How and where considered in the PEIR
ii. biodiversity, geodiversity and nature, particularly in relation to designations, displacement, disturbance and collision and the impact of emissions/contamination; *[…]* *B. Where appropriate, proposals should include provision for decommissioning at the end of their operational life. Where decommissioning is necessary, the site should be restored, with* *minimal adverse impact on amenity, landscape and biodiversity, and opportunities taken for enhancement of these features. […]"*	
Hull City Council	
"Policy 18 Renewable and low carbon energy *[…]* *2. Development that generates, transmits and/or stores renewable and/or low carbon energy will be supported where the impact is or can be made acceptable. Potential impacts that are particularly relevant to this type of development are:* *a. local amenity, including noise, air quality, water quality, traffic,* *vibration, dust, visual impact, shadow flicker and odour;* *b. biodiversity, particularly in relation to national and international* *designations, and priority species and habitats and geodiversity; […]"*	Air quality impacts resulting from the Projects has been considered in section 26.6.
"Policy 47 Atmospheric Pollution *[…]* *2. An assessment of air quality must accompany applications for major development which could individually, or cumulatively with planning permissions and/or developments under construction:*	Air quality impacts resulting from the Projects have been considered in section 26.6. The scope and methodology has been agreed with East Riding of Yorkshire Council and Hull City Council as detailed in **Table 26-1**.

Summary of Local Planning Policy	How and where considered in the PEIR
a. worsen air quality within an Air Quality Management Area; *[…]* *3. The scope of any assessment of air quality should be agreed prior to the submission of a planning application and will be required to:* *a. identify the site, development proposal and area in which the impacts will be assessed;* *b. assess the existing air quality;* *c. assess the impact of the proposal on air quality individually and in conjunction with any outstanding planning permission or development under construction; and* *d. identify mitigation measures and quantify the impact of those* *measures.* *4. In additional to criteria 2 and 3 above, if the development is located within 200m of the Humber Estuary SAC, the application should specifically address the impact of the proposal on the SAC designated saltmarsh. Where effects cannot be avoided, appropriate mitigation measures should be provided to ensure that there is no adverse effect on the integrity of the Humber Estuary SAC.* *5. Development which cannot appropriately mitigate air quality concerns, including dust and odour, will only be supported where the social and economic benefits significantly outweigh the negative impact on air quality."*	A cumulative assessment is discussed in section 26.4.4. Impacts on receptors within the AQMA and the ecological designated sites, which are adjacent to a potential construction traffic route, (including coastal saltmarsh within the Humber Estuary SAC) have been considered as presented in section 26.6.1.3
Hull City Council has produced a Supplementary Planning Document (SPD) on Environmental Quality (SPD3) (Hull City Council, 2019b). This document and its appendices detail Hull City Council's requirements with regard to environmental assessment of a project, including air quality.	The requirements of the Hull City Council SPD3 and its appendices on environmental quality (Hull City Council, 2019b) is considered within this assessment and discussed in section 26.6.

Summary of Local Planning Policy	How and where considered in the PEIR
SPD3 provides additional planning guidance on Policy 47 – Atmospheric Pollution included within the Hull Local Plan 2016 to 2032 (Hull City Council, 2017). Appendix E of SPD3 contains air quality guidance for planners and developers (Hull City Council, 2018).	

26.4.1.2.6 Guidance

47. The following guidance documents have been used within the assessment:

- Appendix E of SPD3: Air Quality Guidance for Planners and Developers (Hull City Council, 2018)
- Guidance on Decision-making Thresholds for Air Pollution: Main Report and Technical Report (Chapman and Kite, 2021a and 2021b).
- Guidance on the assessment of air quality impacts on designated nature conservation areas (IAQM, 2020).
- Guidance on the assessment of impacts from construction dust and fine particulate matter (IAQM, 2016).
- Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (Natural England, 2018).
- Land-Use Planning and Development Control: Planning For Air Quality (IAQM and EPUK, 2017).

26.4.2 Data and Information Sources

26.4.2.1 Data Sources

48. A desk study was undertaken to obtain information on baseline air quality within the air quality study area. Data has been acquired within the air quality study area through a detailed desktop review of existing studies and datasets. The following sources of information that have been used to inform the assessment are listed in **Table 26-8**.

Table 26-8 Key sources of Air Quality Data

Data Set	Spatial Coverage	Year	Notes
East Riding of Yorkshire Council Air Quality Annual Status Report 2022	Covers area within East Riding of Yorkshire Council's jurisdiction	2017 - 2021	Local monitoring data and baseline information
Hull City Council Air Quality Annual Status Report 2022	Outside of Projects' development areas but within the air quality study area	2017 - 2021	
Defra LAQM Technical Guidance (TG22) (Defra, 2022b)	UK	2022	Assessment methodology
Defra's LAQM Support Portal	UK	Assessment years	2018 1 x 1km grid background pollution maps
JNCC (Chapman and Kite, 2021a and 2021b)	UK	2021	Guidance on Decision- making Thresholds for Air Pollution: Main Report and Technical Report
Centre for Ecology and Hydrology (CEH)	UK	2023	Air Pollution Information System. Details of critical loads for ecological habitats
Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK)	UK	2017	Assessment methodology
IAQM	UK	2016	Guidance on the assessment of impacts from construction dust and fine particulate matter
	UK	2020	Guidance on the assessment of air quality impacts on designated nature conservation areas
Natural England	UK	2018	Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations

26.4.3 Impact Assessment Methodology

49. **Chapter 6 EIA Methodology** provides a summary of the general impact assessment methodology applied to the Projects. The following sections describe the methods used to assess the likely significant effects on local air quality.

26.4.3.1 Construction Phase Dust and Fine Particulate Matter

50. Assessment of potential impacts associated with construction phase dust and fine particulate matter emissions was undertaken in accordance with the latest IAQM guidance (IAQM, 2016). The terminology therefore differs from the generic impact assessment terminology presented within **Chapter 6 EIA Methodology.**

51. A summary of the assessment process is provided below. Full details of the assessment methodology are provided in **Appendix 26.1**

26.4.3.1.1 Construction Phase Assessment Steps

52. The assessment steps are as follows:

    1. Screen the need for a more detailed assessment;
    2. Assessment conducted separately for demolition, earthworks, construction and trackout (the transport of dust and dirt from the construction site onto the public road network):
        a. Determine potential dust emission magnitude;
        b. Determine sensitivity of the area; and
        c. Establish the risk of dust impacts.
    3. Determine site specific mitigation; and
    4. Examine the residual effects to determine if additional mitigation is required.

53. It is anticipated that there will be no dust-generating demolition required as part of the construction phase of the Projects; therefore, this has been not considered as part of the assessment.

26.4.3.1.2 Sensitivity

54. Definitions of the different sensitivity levels for human and ecological receptors to dust (IAQM, 2016) are given in **Table 26.1-2** presented in **Appendix 26.1.**

26.4.3.1.3 Magnitude

55. The magnitude of construction phase dust emissions are defined for each type of activity. These are broken down into four categories: demolition, earthworks, construction and trackout. The dust emission magnitudes can either be small, medium or large and are dependent on the methods of work undertaken and the scale of the activity.

56. The IAQM guidance provides broad ranges of the area of a site, the total building volume and the number of outward vehicle trips which are used to determine the dust emission magnitude.

57. The dust emission magnitudes for each activity of relevance to the Projects are detailed in **Table 26.1-1** presented in **Appendix 26.1**.

26.4.3.1.4 Significance

58. The dust emission magnitude is combined with the sensitivity of the area to determine the risk of impacts prior to mitigation. This is shown in more detail in **Appendix 26.1**. This assessment deviates slightly from the methodology set out in **Chapter 6 EIA Methodology**, as the IAQM guidance does not assign a significance before applying mitigation measures. Once appropriate mitigation measures have been identified as required, the significance of construction phase impacts can be determined. The IAQM guidance considers it to be most appropriate to only assign significance post mitigation as it assumes mitigation is inherent in the design/construction approach. The aim is to prevent significant effects at receptors due to the implementation of effective mitigation. A matrix is therefore not provided in the guidance to determine significance. The guidance notes that, with the implementation of effective mitigation measures, the effects of dust generated during construction would be not significant.

26.4.3.2 Construction Phase NRMM Emissions

59. Defra technical guidance (Defra, 2022b) states that emissions from NRMM used on construction sites are unlikely to have a significant impact on local air quality where relevant control and management measures are employed. The guidance also states that in the vast majority of cases a quantitative assessment of emissions from NRMM is not required, and qualitative consideration of the potential impact is sufficient.

60. NRMM control measures will be implemented as embedded mitigation and therefore, a qualitative assessment of project-generated NRMM used at landfall and during construction of the onshore export cable corridor and/or onshore substations, where impacts on receptors may occur, has been undertaken.

61. This assessment has taken into account:

- The number and type of plant to be used;
- The working hours to be employed and the duration of works;
- Distances from NRMM to the nearest receptors;
- Existing air quality conditions in the area (based on either local monitoring (where available) and/or Defra background pollutant concentration maps (Defra, 2020a)); and
- Prevailing meteorological conditions.

62. The significance of effects have been determined using professional judgement, taking into account the factors above.

26.4.3.3 Construction Road Vehicle Exhaust Emissions

26.4.3.3.1 Traffic Data

63. The derivation of the traffic data used in the air quality assessment is detailed in **Chapter 24 Traffic and Transport**.

64. Twenty-four hour annual average daily traffic (AADT) flows and HGV percentages have been derived for the worst case construction year scenarios. The traffic data for the assessment is detailed in **Appendix 26.2**.

65. Traffic data have been factored to account for traffic growth between 2019 and 2026, by applying background growth factors that account for regional traffic growth from the Trip End Model Presentation Program (TEMPro), which takes into account traffic growth from committed developments (e.g., residential developments and employment developments).

26.4.3.3.2 Screening Criteria and Assessed Road Links/Haulage Routes

66. The requirement for a detailed assessment of construction vehicle exhaust emissions at human receptors has been considered using screening criteria provided by IAQM and EPUK (2017). Guidance from recently released reports by the JNCC (Chapman and Kite, 2021a and 2021b) has been used for the screening of ecological receptors, within 200m from ARN. The assessment screening criteria are detailed in **Table 26-9.**

Table 26-9 Road Traffic Assessment Screening Criteria

Guidance Document	Receptor	Screening Criteria	
IAQM and EPUK (2017)	Human receptors	Light Duty Vehicles (LDVs)	A change in annual average daily traffic (AADT) of more than 100 within or adjacent to an AQMA, or more than 500 elsewhere.
		Heavy Duty Vehicles (HDVs)	An increase in HDV movements of more than 25 per day within or adjacent to an AQMA, or more than 100 elsewhere.
JNCC (Chapman and Kite, 2021a and 2021b)	Ecological receptors	AADT	An increase 0.15% or more of existing AADT (over 5 years) (i.e., the 'Decision-making Threshold' (DMT))

67. Ecological receptors are screened inclusive of in-combination traffic growth from the base year (2019) to the future base year (2026). Reasoning for this is provided in further detail in section 26.4.3.3.

68. The increases in traffic flows on the road network associated with the construction phase of DBS East and/or DBS West have been screened using the criteria detailed in **Table 26-9.**

69. As mentioned previously in section 26.3.2, this was undertaken for DBS East or DBS West in isolation and for the concurrent scenario as they represent the worst case with regard to construction traffic. See **Chapter 5 Project Description** for further detail on the different construction scenarios.

70. All road links are anticipated to experience increases in traffic flows greater than the stringent JNCC DMT screening criteria (i.e., 0.15% of existing 2019 baseflow AADT). As such, sensitive ecological receptor locations have been identified on all ARN links for DBS East or DBS West in isolation and DBS East and DBS West concurrent construction, as shown in **Figure 26-4**.

71. The road links which are predicted to experience increases in vehicle numbers and HGVs in exceedance of the human receptor screening criteria for DBS East or DBS West in isolation and DBS East and DBS West concurrent construction are detailed in **Table 26-10** and discussed in section 26.4.3.3.7.4.

72. Traffic flows on the temporary haul roads within the Onshore Development Area to be used for DBS East and/or DBS West during construction have also been screened against the criteria detailed in **Table 26-9** and discussed in section 26.4.3.3.7.5

Table 26-10 Human Receptor Screening – Affected Road Links Under DBS East or DBS West in Isolation and DBS East and DBS West Concurrent Construction. Boxes shaded in green show traffic flows (LDV and/or HGVs) that exceed the IAQM & EPUK (2017) criteria

Link ID	Road	Number of vehicles generated by the construction phase of DBS East and DBS West as AADT– Human Receptor Screening (2026)			
		DBS East or DBS West in Isolation		DBS East and DBS West Concurrent Construction	
		LDVs	HGVs	LDVs	HGVs
2	A165 Lissett to Beeford	16	61	27	103
3	A165 Beeford to Brandesburton	171	119	340	204
4	B1242 Lissett to Skipsea	1	61	2	103
5	Beeford Road	49	61	101	103
6	B1242 Skipsea to End	78	61	154	103
7	Dunnington Lane	79	58	163	101
9	A165 Brandesburton to Leven	250	176	509	300
10	A1035 Level to Catwick	81	92	169	150
12	A1035 Leven to A165	327	268	670	449

Link ID	Road	Number of vehicles generated by the construction phase of DBS East and DBS West as AADT– Human Receptor Screening (2026)			
		DBS East or DBS West in Isolation		DBS East and DBS West Concurrent Construction	
		LDVs	HGVs	LDVs	HGVs
13	A165 from A1035 to Skirlaugh	177	337	368	559
14	A165 through Skirlaugh	26	337	49	559
15	A165 from Skirlaugh to Coniston	22	337	42	559
16	A165 from Coniston to Holderness Road	22	337	42	559
17	A165/Holderness Road	22	337	42	559
18	A165/Holderness Road	22	337	42	559
19	Mount Pleasant/A1033	52	667	88	988
20	A1033 Slip Road	23	667	41	988
21	A1033/Hedon Road	24	667	44	988
22	A1033/Hedon Road	24	667	44	988
23	A1033/Hedon Road	0	667	0	988
24	A63	34	667	51	988
25	A63	34	667	51	988
26	A63	0	667	0	988
27	A63	327	667	555	988
28	A15/Boothferry Road	327	667	555	988

Link ID	Road	Number of vehicles generated by the construction phase of DBS East and DBS West as AADT- Human Receptor Screening (2026)			
		DBS East or DBS West in Isolation		DBS East and DBS West Concurrent Construction	
		LDVs	HGVs	LDVs	HGVs
30	A164	608	667	1,028	988
31	A164	616	667	1,043	988
32	A164	794	667	1,337	988
33	A164	794	667	1,337	988
34	A164	965	667	1,625	988
35	A164	1,097	667	1,806	988
36	Dunflat Road off A164	121	97	248	145
37	Coppleflat Lane	121	97	248	145
38	A164	781	667	1,300	988
40	A1033/Thomas Clarkson Way	86	667	157	988
45	A1033	75	667	202	988
50	A164/ Woodmansey	498	533	976	892
51	A164/Woodmansey	730	667	1,212	988

Link ID	Road	Number of vehicles generated by the construction phase of DBS East and DBS West as AADT– Human Receptor Screening (2026)			
		DBS East or DBS West in Isolation		DBS East and DBS West Concurrent Construction	
		LDVs	HGVs	LDVs	HGVs
52	A1174/A164	526	533	1,042	892
53	A1174/A164/Swinemoor Lane	526	533	1,042	892
54	A1035	472	337	975	559
55	A1035	572	413	1,137	684
56	A1035	691	533	1,350	892
57	A1035/A164	212	88	441	137
60	A1035	220	118	442	187
61	A1035/Dog Kennel Lane	208	118	397	187
62	A1174	61	76	132	125
63	A1079	530	501	818	736
64	Killingwoldgraves Lane	30	97	65	145
66	A1079	254	667	479	988
68	Coppleflat Lane	30	97	65	145
71	Broadgate/B1230	76	97	163	145
74	Mount Pleasant/A1033 and Stoneferry Rd/A1165	68	667	105	988

Link ID	Road	Number of vehicles generated by the construction phase of DBS East and DBS West as AADT– Human Receptor Screening (2026)			
		DBS East or DBS West in Isolation		DBS East and DBS West Concurrent Construction	
		LDVs	HGVs	LDVs	HGVs
75	Sutton Road/A1033	92	667	146	988

26.4.3.3.3 Assessment Scenarios

73. The onshore construction works of both DBS East or DBS West in isolation and DBS East and DBS West concurrent construction are expected to occur over an approximate five-year period from 2026.

74. To provide a conservative assessment, the maximum annual average project-generated traffic across the construction period was combined with the earliest year of construction, where pollutant emission rates and background concentrations would be higher than in later years of construction.

75. At this stage, the peak construction traffic flows have been used to derive AADT flows for the purposes of the air quality assessment, which is considered to represent a conservative scenario. For the ES, more representative 'true' AADT flows will be derived which will provide a more appropriate representation of construction impacts from traffic over an annual period and aligns with the requirement for use of AADT flows in consideration of the resulting annual average pollutant concentrations, as set out in Defra Technical Guidance (Defra, 2022b).

76. The assessment has therefore considered the following scenarios:

- Verification / Base year (2019);
- Worst case Construction Year (2026) without and with DBS East or DBS West in isolation; and
- Worst case Construction Year (2026) without and with DBS East and DBS West constructed concurrently.

77. A base year of 2019 has been used in the assessment as it was considered that conditions in 2020 and 2021 would not provide a representative baseline due to the Covid-19 outbreak in 2020. Therefore, it would not be possible to represent short or longer term impacts on emissions in 2020 and 2021 as a result of behavioural changes during national or local lockdowns within the dispersion model.

78. It should be noted that traffic data at the PEIR stage does not include any changes to baseline traffic flows as a result of the A63 Castle Street improvements in Hull, nor the Jocks Lodge junction improvement scheme which are under construction and will be operational prior to construction of the Projects. The Applicant will undertake further engagement with National Highways to understand how these schemes should be considered within the ES.

26.4.3.3.4 Background Pollutant Concentrations

79. The assessment requires the derivation of background pollutant concentration data that are factored to the year of assessment, to which contributions from the assessed roads are added. Background NO_2, PM_{10} and $PM_{2.5}$ concentrations are therefore obtained from Defra mapping (Defra, 2020a) for the 1km x 1km grid squares covering the study area and receptor locations for the 2019 and 2026 assessment years. This approach was agreed with the EHOs at East Riding of Yorkshire Council and Hull City Council during technical engagement (pers. comm., 9 December 2022).

80. Background NH_3, nutrient nitrogen and acid deposition concentrations have been obtained from the APIS website (CEH, 2023) and are provided for 5km x 5km grid squares. The data are provided as three-year averages (2018-2020) and are not factored forward to future years.

26.4.3.3.5 Human Receptor Assessment Methodology

26.4.3.3.5.1 Dispersion Model

81. The potential impact of exhaust emissions from construction road vehicles accessing the Onshore Development Area was assessed using the Atmospheric Dispersion Modelling System for Roads (ADMS-Roads) v5.0.1.3. The main pollutants of concern for human health as a result of vehicle emissions are annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$. Concentrations of these pollutants are therefore the focus of the ADMS-Roads assessment.

82. Detailed dispersion modelling has not been undertaken for ecological receptors as a semi-quantitative approach has been taken, using data provided by the JNCC (Chapman and Kite, 2021a and 2021b) to consider impacts at designated sites. This is discussed in further detail in section 26.4.3.3.7.

26.4.3.3.5.2 Traffic Data

83. Traffic speeds included in the air dispersion model as follows:

- Large roundabouts modelled at 40km h^{-1};
- Small roundabouts and queues modelled at 20km h^{-1}; and
- Speed data for free-flowing traffic conditions have been obtained from average speeds recorded during the traffic count surveys (discussed in **Chapter 24 Traffic and Transport**) where applicable, or national speed limits.

26.4.3.3.5.3 Emission Factors

84. Emission factors have been obtained from the Emission Factor Toolkit (EFT) v11.0 provided by Defra (Defra, 2021b). 2019 emission factors have been used in the verification/base year assessment and emission factors for 2026 has been used in the future year 'without Projects' and 'with Projects' scenarios.

85. There has historically been uncertainty in the future vehicle emissions projections in previous versions of the EFT, particularly v8.0 and earlier. However, evidence was published to suggest that v9.0 of the EFT onwards provide a reasonable prediction of vehicle emissions into the future and therefore sensitivity testing is not required (Air Quality Consultants, 2020). Given this evidence, the use of 2026 emission factors in the assessment is considered to be appropriate.

86. The use of future year emission factors was agreed with the EHOs at East Riding of Yorkshire Council and Hull City Council during technical engagement (pers. comm., 9 December 2022).

87. The default fleet projections in EFT v11.0 are based on fleet growth assumptions which were current before the Covid-19 outbreak in the UK. In consequence, default fleet outputs from the tool do not reflect short- or longer-term impacts on emissions in 2020 and 2021 or beyond resulting from behavioural change during the national or local lockdowns (Defra, 2021b).

26.4.3.3.5.4 Meteorological Data

88. Leconfield meteorological station is located within the study area and has therefore been used to replicate meteorological conditions within the ADMS-Roads model.

89. The use of the 2019 Leconfield meteorological station data was agreed with the EHOs at East Riding of Yorkshire Council and Hull City Council during technical engagement (pers. comm., 9 December 2022).

26.4.3.3.5.5 Surface Roughness

90. Surface roughness is a value (in metres) which is used to modify the wind profile within the model to represent the spatial density, orientation and height of obstacles to the approaching wind. A variable surface roughness file was used in the model to represent the varying surface roughness within the air quality study area. A surface roughness of 1 m was selected to represent the city of Hull as well as the more built-up area of Beverley town centre which is representative of 'Cities, woodland'. A surface roughness of 0.3 m was selected to represent the remainder of the study area as well as the met site which is representative of 'Agricultural areas (max)'.

26.4.3.3.5.6 Model Verification

91. Model verification is the process of adjusting model outputs to improve the consistency of modelling results with respect to available monitored data. In this assessment, model uncertainty was minimised following Defra (2022b) and IAQM and EPUK (2017) guidance.

92. Dispersion models may perform differently at background, roadside, and kerbside sites. Kerbside sites are generally not recommended for the adjustment of road traffic modelling results as the inclusion of these sites may lead to an over-adjustment of modelling at roadside sites (Defra, 2022b). However, due to the lack of representative roadside sites, some kerbside monitoring sites have been included where exposure is considered representative of modelled receptors to provide a robust assessment

93. Monitoring locations within the study area have been reviewed to establish the suitability for use in model verification. Locations have been considered where the assessed road links provided sufficient representation of road traffic sources that would affect monitored concentrations at that point. Monitoring locations that are situated in proximity to several road links which are not considered in the assessment are discounted on the basis that modelled concentrations would be underestimated.

94. Two separate model adjustment factors have been derived to represent the difference in local conditions within the city of Hull and East Riding of Yorkshire which is more rural or suburban in nature.

26.4.3.3.5.6.1 East Riding of Yorkshire Council

95. A review of the monitoring data identified three NO_2 diffusion tubes located on the considered road network with available data for 2019. These diffusion tubes and the reason for their inclusion or exclusion in the verification process are detailed in **Table 26-11.**

Table 26-11 Model Verification Diffusion Tubes – East Riding of Yorkshire Council

Site ID	Site Type	Included or Excluded	Reasoning
S30	Kerbside	Included	Located adjacent to A164 and although the locations are classed as kerbside sites, they are all considered representative of residential exposure. Therefore, the sites have been included to provide a robust assessment.
S33	Kerbside	Included	
S34	Kerbside	Included	

96. Details of the NO_2 model verification process, undertaken using 2019 monitoring data, are provided in **Table 26-12**.

Table 26-12 Model Verification (the adjustment factor is highlighted in bold) – East Riding of Yorkshire Council

Model Verification	**NO_2 Monitoring Location**		
	S30	**S33**	**S34**
2019 Annual Mean Monitored Total NO_2 Concentration ($\mu g.m^{-3}$)	23.0	17.0	29.0
2019 Annual Mean Background NO_2 Concentration* ($\mu g.m^{-3}$)	10.3	10.3	10.4
Monitored Road Contribution NOx (total - background) ($\mu g.m^{-3}$)	24.0	12.4	36.1
Modelled Road Contribution NOx (excludes background) ($\mu g.m^{-3}$)	8.3	6.3	13.3
Ratio of Monitored Road Contribution NOx / Modelled Road Contribution NOx	2.9	2.0	2.7
Adjustment Factor for Modelled Road Contribution	**2.6**		
Adjusted Modelled Road Contribution NOx ($\mu g.m^{-3}$)	22.1	16.6	35.3
Modelled Annual Mean Total NO_2 (based on empirical NOx / NO_2 relationship) ($\mu g.m^{-3}$)	22.0	19.2	28.6
Monitored Annual Mean Total NO_2 ($\mu g.m^{-3}$)	23.0	17.0	29.0
% Difference [(modelled - monitored) / monitored] x 100	-4%	13%	-1%

97. The Root Mean Square Error (RMSE) is "*used to define the average error or uncertainty of the model*" and should be within the ideal value of $4\mu g.m^{-3}$ (i.e. 10% of the annual mean NO_2 Objective of $40\mu g.m^{-3}$), as specified in Defra technical guidance (TG22) (Defra, 2022b). If the RMSE value is higher than ± 25% of the Objective (i.e. $10\mu g.m^{-3}$), Defra guidance recommends that model inputs and verification should be revised. The RMSE of the model was $1\mu g.m^{-3}$. Model performance in this assessment was therefore considered to be suitable, as the RMSE was within the ideal value.

98. There are no 2019 PM_{10} and $PM_{2.5}$ monitoring data available within East Riding of Yorkshire Council to undertake model verification. Therefore, the derived NOx adjustment factor has been applied to the modelled PM_{10} and $PM_{2.5}$ concentrations to provide a conservative assessment (in accordance with guidance in LAQM TG(22) (Defra, 2022b)).

26.4.3.3.5.6.2 Hull City Council

99. A review of the monitoring data identified five NO_2 diffusion tubes located on the considered road network with available data for 2019. These diffusion tubes and the reason for their inclusion or exclusion in the verification process are detailed in **Table 26-13**.

Table 26-13 Model Verification Diffusion Tubes – Hull City Council

Site ID	Site Type	Included or Excluded	Reasoning
CM3	Roadside	Included	Located on Link 18 (A164), this is a suitable roadside monitoring site and has monitoring data available.
S4	Roadside	Included	Located on Link 25 (A63), this is a suitable roadside monitoring site and has monitoring data available.
S13	Roadside	Included	Located adjacent to the A63 and is a suitable roadside monitoring site with monitoring data available.
S36	Roadside	Excluded	The diffusion tube is located within 1m of the kerb of A1033 (Hull City Council, 2022). With reference to Defra Technical Guidance (Defra, 2022), this site would therefore be classed as a kerbside site. Kerbside sites are generally not recommended for the adjustment of road traffic modelling results as the inclusion of these sites may lead to an over-adjustment of modelling results at roadside sites. As there are no residential receptors within 1m of the A1033 near to diffusion tube S36, the site has been excluded.

100. Details of the NO_2 model verification process, undertaken using 2019 monitoring data, are provided in **Table 26-14**.

Table 26-14 Model Verification (the adjustment factor is highlighted in bold) – Hull City Council

Model Verification	**NO_2 Monitoring Location**		
	CM3	**S13**	**S4**
2019 Annual Mean Monitored Total NO_2 Concentration ($\mu g.m^{-3}$)	26.0	36.9	30.6
2019 Annual Mean Background NO_2 Concentration* ($\mu g.m^{-3}$)	17.5	20.7	20.7
Monitored Road Contribution NOx (total - background) ($\mu g.m^{-3}$)	16.4	32.8	19.7
Modelled Road Contribution NOx (excludes background) ($\mu g.m^{-3}$)	9.2	13.6	15.2
Ratio of Monitored Road Contribution NOx / Modelled Road Contribution NOx	1.8	2.4	1.3
Adjustment Factor for Modelled Road Contribution	**1.8**		
Adjusted Modelled Road Contribution NOx ($\mu g.m^{-3}$)	16.4	24.3	27.1
Modelled Annual Mean Total NO_2 (based on empirical NOx / NO_2 relationship) ($\mu g.m^{-3}$)	27.1	34.5	30.3
Monitored Annual Mean Total NO_2 ($\mu g.m^{-3}$)	26.0	32.9	34.3
% Difference [(modelled - monitored) / monitored] x 100	0%	-11%	12

101. The RMSE of the model was $3\mu g.m^{-3}$. Model performance in this assessment was therefore considered to be suitable, as the RMSE was within the ideal value of $4\mu g.m^{-3}$ as specified in Defra technical guidance (TG22) (Defra, 2022b).

102. There are no 2019 PM_{10} and $PM_{2.5}$ monitoring data available within Hull City Council to undertake model verification. Therefore, the derived NOx adjustment factor has been applied to the modelled PM_{10} and $PM_{2.5}$ concentrations to provide a conservative assessment (in accordance with guidance in LAQM TG(22) (Defra, 2022b)).

103. The adjustment factor for the City of Hull was applied to all receptors within the administrative boundary of Hull City Council as well receptors along the A63 as the location is considered more consistent with the urban nature of Hull than the rural and suburban nature of East Riding of Yorkshire Council.

26.4.3.3.5.7 NOx to NO_2 Conversion

104. NOx concentrations have been predicted using the ADMS-Roads model. The modelled road contribution of NOx at the identified receptor locations was then converted to NO_2 using the NOx to NO_2 calculator (v8.1) (Defra, 2020c), in accordance with Defra guidance (Defra, 2022b).

26.4.3.3.5.8 Calculation of Short-term Pollutant Concentrations

105. Defra guidance (Defra, 2022b) sets out the method for the calculation of the number of days, in which the PM_{10} 24-hour Objective is exceeded, based on a relationship with the predicted PM_{10} annual mean concentration. The relevant calculation utilised in the prediction of short-term PM_{10} concentrations was:

$$No.\,24\ hour\ mean\ exceedance = -18.5 + 0.00145\ x\ (annual\ mean)^3 + \left(\frac{206}{annual\ mean}\right)$$

106. Research projects completed on behalf of Defra and the Devolved Administrations (Laxen and Marner, 2003; AEAT, 2008) concluded that the hourly mean NO_2 Objective is unlikely to be exceeded if annual mean concentrations are predicted to be less than 60µg.m^{-3}. This value was therefore used as an annual mean equivalent threshold to evaluate likely exceedance of the hourly mean NO_2 Objective.

26.4.3.3.5.9 Sensitivity

107. The sensitivity of a human receptor is not considered in the assessment of air quality impacts; the air quality Objectives in **Table 26-5**, which are health-based, only apply at locations where there is relevant public exposure as detailed in **Table 26-15**.

Table 26-15 Examples of Where the Air Quality Objectives Should/Should Not Apply

Averaging Period	Objectives Should Apply At:	Objectives Should Generally Not Apply At:
Annual mean	All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes, etc.	Building facades of offices or other places of work where members of the public do not have regular access.
24-hour mean and 8-hour mean	All locations where the annual mean Objective would apply, together with hotels and gardens of residential properties.	Hotels, unless people live there as their permanent residence.
1-hour mean	All locations where the annual mean and 24 and 8-hour mean Objectives apply. Kerbside sites (for example, pavements of busy shopping streets).	Gardens of residential properties.

108. Sensitive receptor locations that experience pollutant concentrations close to, or in exceedance of the Objectives experience a larger impact magnitude with a smaller change in pollutant concentrations, as detailed below.

26.4.3.3.6 Magnitude and Significance

109. Guidance is provided by the IAQM and EPUK (IAQM and EPUK, 2017) on determining the magnitude and significance of a project's impact on local air quality. The guidance was developed specifically for use in planning and assessing air quality impacts associated with mixed-use and residential developments. However, due to the nature of the Projects, the criteria detailed below has been utilised in the assessment to provide consideration of the impacts associated with the Projects.

110. The impact descriptors that take account of the magnitude of changes in pollutant concentrations, and the concentration in relation to the air quality Objectives, are detailed in **Table 26-16**.

Table 26-16: Impact Descriptors for Individual Receptors

Long Term Average Concentration at Receptor in Assessment Year	**% Change in Concentration Relative to the Air Quality Objective**			
	1	**2-5**	**6-10**	**>11**
75% or less of Objective	*Negligible*	*Negligible*	*Slight*	*Moderate*
76 - 94% of Objective	*Negligible*	*Slight*	*Moderate*	*Moderate*
95 - 102% of Objective	*Slight*	*Moderate*	*Moderate*	*Substantial*
103 - 109 of Objective	*Moderate*	*Moderate*	*Substantial*	*Substantial*
110% or more of Objective	*Moderate*	*Substantial*	*Substantial*	*Substantial*
Note: Figures are to be rounded up to the nearest round number. Any value less than 1% after rounding (effectively less than 0.5%) will be described as "Negligible".				

111. Further to the determination of the impact at individual receptors, the guidance recommends that assessment is made of the overall significance of the impact from a development on local air quality. The overall significance will need to take into account the following factors:

- The existing and future air quality in the absence of the Projects;
- 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.

112. The guidance also states that a judgement of the significance should be made by a competent professional who is suitably qualified. This air quality assessment and determination of the significance of the Projects on local air quality was undertaken by members of the IAQM.

113. Hull City Council provides guidance on determining the significance of a development's impact on air quality in its supplementary planning guidance 'Air Quality Guidance for Planners and Developers' (Hull City Council, 2018). The guidance is largely based on the IAQM and EPUK Guidance (IAQM and EPUK, 2017) and therefore the approach to determining significance is in line with that detailed above. However, during consultation with Hull City Council, the Air Quality Officer also requested that existing monitored concentrations be the criteria for significance, rather than the air quality Objectives (pers. comm., 9 January 2023). Both approaches have been included to determine the significance of the Projects on air quality within Hull City Council.

26.4.3.3.7 Ecological Receptor Assessment Methodology

114. The JNCC published a suite of documents (Chapman & Kite, 2021a and 2021b) which provide guidance on cumulative and in-combination effects assessment for projects and plans which generate increases in atmospheric nitrogen emissions. The reports deal with identifying thresholds for road traffic flow increases, above which detailed assessment of the effects upon Critical Level and/or Critical Loads for nitrogen at nearby designated sites would be required. The reports were solely concerned with the effects arising as a result of permanent and lasting changes (increases) in operational phase road traffic flows, associated exhaust emissions of NH_3 and NOx and consequent permanent effects on designated sites.

115. While any potential effects of DBS East or DBS West traffic emissions on ecological sites during construction will be short-term, transient and temporary, the guidance, screening criteria and methodology provided in JNCC reports have been used for this assessment of ecological receptors. The JNCC reports provide data on the magnitude of increases in pollutant concentrations and deposition (NOx, NH_3, N-dep and acid) with different levels of traffic generation experienced, at varying distances from the road, based on detailed modelling and monitoring measurements. The JNCC Technical Report (Chapman and Kite, 2021b) states that the road-relevant approach provided in the report is expected to provide robust and representative, albeit indicative, information which will often be better than a detailed model if that model has not been verified against measurements. As such, the consideration of effects on designated ecological sites has been undertaken using a semi-quantitative approach, using the data provided within the JNCC reports, without project-specific detailed dispersion modelling.

116. Use of the JNCC guidance has allowed for a more conservative assessment of any potential road traffic emission impacts on ecological receptors, as the 0.15% increase in AADT screening criterion (or DMT) is more stringent than the screening criteria of a 1,000 AADT or 200 HGV increase provided in Natural England (2018), IAQM (2020) and National Highways (2019). As such, a greater number of links, and therefore a greater number of ecological receptors, have been screened into the assessment.

117. As discussed in section26.4.3.3.1 and provided in **Table 26-9,** the first step of the ecological assessment was to screen the road links for increases in AADT (inclusive of (a) project-generated traffic, and (b) 2019 to 2026 baseline traffic growth – see the following section) greater than a DMT of 0.15% of existing 2019 AADT flows. This resulted in the screening in of all road links considered in the assessment. Following this, a search of ecological receptors within 200m of these road links with habitats/features sensitive to air pollutants has then been undertaken. The ecological receptors present within 200m of road links are presented in **Table 26-25**, as well as reasoning for their inclusion/exclusion in the assessment.

26.4.3.3.7.1 In-combination Assessment

118. A project or plan in isolation may not lead to significant effects, however the 2017 EIA Regulations require the consideration of effects associated with a project or plan both in isolation, and in addition to other plans or projects which may affect the same designated site (an 'in-combination' assessment). The outcome of a recent court judgement[2] has led to the requirement for the 1% criterion to be applied to the in-combination effect to determine whether effects remain insignificant, or whether further ecological investigation is required. As such, effects on ecological sites are therefore inherently considered cumulatively.

119. The road links which pass alongside the designated sites considered in the assessment will experience background traffic growth between the base year (2019) and the year of earliest construction (2026), which may increase nutrient nitrogen/acid deposition or NOx at the designated sites. These in-combination effects have been considered in the impact assessment (see section 26.6.1.3).

[2] Wealden Judgement, (2017), Wealden District Council v Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority EWHC 351 (Accessed January 2023)

120. In addition, any consented agricultural or industrial projects in the vicinity of designated sites which may be affected by traffic generated by DBS East or DBS West may also contribute to in-combination nutrient nitrogen/acid deposition and NOx concentrations. Natural England developed SSSI Impact Risk Zones (IRZs) which specify the types of projects which may impact on SSSIs based on the distance from the site, as shown in **Table 26-17.**

121. At present, the in-combination assessment does not take into consideration in-combination impacts from agricultural or industrial projects. This will be undertaken during the later stages of the EIA, once further information is available on a number of projects. However, for the ES these IRZ criteria will be applied to relevant Special Areas of Conservation (SACs), Special Protection Areas (SPAs), ancient woodlands and Local Nature Reserves (LNRs), in addition to SSSIs, to provide a conservative in-combination assessment. Additional contributions of nutrient nitrogen from these sources (from both NO_2 and NH_3) and airborne NOx will be included in the 'in-combination' assessment, where sufficient information is included within the application to quantify these emissions.

Table 26-17 Natural England's SSSI IRZ

Distance from Designated Site	**Proposals, Permissions And Permits**	
	Air Pollution	**Combustion**
0 to 0.05km	All planning applications, except householder applications	
0.05 to 0.2km	Any development that could cause air pollution or dust either in its construction or operation (including industrial/commercial processes, livestock and poultry units, slurry lagoons and digestate stores, manure stores). All general combustion processes including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.	All general combustion processes. Including: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.

Distance from Designated Site	Proposals, Permissions And Permits	
	Air Pollution	**Combustion**
0.2 to 0.5km	Any development that could cause air pollution (including industrial/commercial processes, livestock and poultry units, slurry lagoons and digestate stores, manure stores). All general combustion processes including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.	
0.5 to 2km	Any industrial/agricultural development that could cause air pollution (including industrial processes, livestock and poultry units with floorspace > 500m², slurry lagoons and digestate stores > 200m², manure stores > 250t). General combustion processes >20MW energy input including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.	General combustion processes >20MW energy input. Including: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.
0.5 to 2km	Any industrial/agricultural development that could cause air pollution (including industrial processes, livestock and poultry units with floorspace > 500m², slurry lagoons and digestate stores > 200m², manure stores > 250t). General combustion processes >20MW energy input including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.	General combustion processes >20MW energy input. Including: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.

Distance from Designated Site	Proposals, Permissions And Permits	
	Air Pollution	**Combustion**
2 to 5km	Any industrial/agricultural development that could cause air pollution (including industrial processes, livestock and poultry units with floorspace > 500m², slurry lagoons and digestate stores > 750m², manure stores > 3500t). General combustion processes >50MW energy input including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.	General combustion processes >50MW energy input. Including: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/combustion.

122. This approach to the assessment is also in accordance with the requirements of IAQM Guidance on the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (IAQM, 2020).

26.4.3.3.7.2 Sensitivity

123. Designated ecological sites have been considered only where they are sensitive to the effects of air pollution. Whilst Critical Levels (see **Table 26-6**) apply regardless of habitat type, Critical Loads for habitat sites in the UK are published on the Air Pollution Information System (APIS) website (CEH, 2023). These are the maximum levels of nutrient nitrogen and acid deposition that can be tolerated without harm to the most sensitive features of these habitat sites (see **Table 26-26**).

26.4.3.3.7.3 Magnitude and Significance

124. An increase in Critical Load or Level of less than 1% is typically considered to be insignificant, as a change of this magnitude is likely to be within the natural range of fluctuations in deposition and is unlikely to be perceptible. The 1% threshold of insignificance is referenced in Natural England (2018), IAQM (2020) and Chapman and Kite (2021a, 2021b). The exceedance of a threshold is not decisive in and of itself, nor does it suggest that damage is likely to occur (in the case of SSSIs) or that it will not be possible to avoid adverse effects to site integrity (in the case of European sites) (Chapman and Kite, 2021a).

125. Using the JNCC reports (Chapman and Kite, 2021a and 2021b), it is possible to apply a road-relevant approach based on the distance between the ARN and the nearest boundary of a designated site. The thresholds proposed in the JNCC reports focus on SSSI and European designated sites; however, they have also been applied to ancient woodlands and LNRs in this assessment in order to provide a conservative and robust assessment.

126. **Table 26-18** provides the AADT change which is required to trigger an exceedance of 1% of the Critical Level for NOx and NH_3 at different distances from a roads edge. **Table 26-19** contains similar values for nutrient nitrogen deposition (N-dep) Critical Loads at different distances from a road edge. As discussed above, the 1% threshold is taken from the Natural England (2018) guidance document on the assessment of traffic emissions as the threshold of insignificance to be applied as part of an in-combination assessment. It should be noted that these tables are based on an average vehicle fleet mix in 2019 for NOx and 2015 for NH_3; as such, changes in emissions of these pollutants into the future is not accounted for.

Table 26-18 AADT Changes (for a typical fleet composition) Required to Cause a Change of 1% of Critical Levels as a Function of Distance from the Edge of a Road (Chapman and Kite, 2021b) [Amended]

Distance from Road Edge (m)	**AADT**		
	1% CL for NOx ($30\mu g.m^{-3}$)	**1% CL for lower NH_3 ($1\mu g.m^{-3}$)**	**1% CL for higher NH_3 ($3\mu g.m^{-3}$)**
1	120	91	274
5	171	259	776
5-10	225	332	995
10	278	405	1,214
10-25	413	568	1,704
25	547	731	2,194
25-50	732	938	2,814
50	917	1,145	3,434

Distance from Road Edge (m)	AADT		
	1% CL for NOx ($30\mu g.m^{-3}$)	**1% CL for lower NH_3 ($1\mu g.m^{-3}$)**	**1% CL for higher NH_3 ($3\mu g.m^{-3}$)**
50-100	1,269	1,468	4,403
100	1,620	1,791	5,372
100-150	2,015	2,059	6,176
150	2,410	2,327	6,980
150-200	2,917	2,565	7,693
200	3,424	2,802	8,406
Colour Coding:			
	AADT provided in the JNCC report (Chapman and Kite, 2021b)		
	Approximate AADT calculated from averaging AADT flows provided in the JNCC report for each distance band (Chapman and Kite, 2021b) (i.e. 100-150m band = average of 1,620 AADT (100m 1% CL for NOx) and 2,410 AADT (150m 1% CL for NOx))		

Table 26-19 AADT Changes (for a typical fleet composition) Required to Cause a Change of 1% of Critical Loads as a Function of Distance from the Edge of a Road (Chapman and Kite, 2021b) [Amended]

Distance from Road Edge (m)	AADT			
	1% CL for N-Dep (5 kg-N.ha^{-1}.yr^{-1})	1% CL for N-Dep (10 kg-N.ha^{-1}.yr^{-1})	1% CL for N-Dep (15 kg-N.ha^{-1}.yr^{-1})	1% CL for N-Dep (20 kg-N.ha^{-1}.yr^{-1})
Deposition to Woodland				
1	35	71	106	142
5	86	171	257	343
5-10	106	211	317	423
10	125	251	376	502
10-25	166	333	499	666
25	207	415	622	829
25-50	255	511	766	1,021
50	303	606	909	1,212
50-100	373	747	1,120	1,493
100	443	887	1,330	1,773
100-150	499	998	1,496	1,994
150	554	1,108	1,661	2,215
150-200	601	1,203	1,803	2,405
200	648	1,297	1,945	2,594

Distance from Road Edge (m)	AADT			
	1% CL for N-Dep (5 kg-N.ha^{-1}.yr^{-1})	1% CL for N-Dep (10 kg-N.ha^{-1}.yr^{-1})	1% CL for N-Dep (15 kg-N.ha^{-1}.yr^{-1})	1% CL for N-Dep (20 kg-N.ha^{-1}.yr^{-1})
Deposition to Woodland				
Deposition to Short Vegetation				
1	59	118	177	236
5	145	291	436	582
5-10	180	360	540	720
10	215	429	644	858
10-25	287	573	860	1,146
25	359	717	1,076	1,434
25-50	444	888	1,332	1,775
50	529	1,058	1,587	2,116
50-100	655	1,310	1,964	2,619
100	780	1,561	2,341	3,121
100-150	880	1,760	2,640	3,520
150	980	1,959	2,939	3,918
150-200	1,066	2,131	3,196	4,261

Distance from Road Edge (m)	AADT			
	1% CL for N-Dep (5 kg-N.ha^{-1}.yr^{-1})	1% CL for N-Dep (10 kg-N.ha^{-1}.yr^{-1})	1% CL for N-Dep (15 kg-N.ha^{-1}.yr^{-1})	1% CL for N-Dep (20 kg-N.ha^{-1}.yr^{-1})
Deposition to Woodland				
200	1,151	2,302	3,453	4,604
Colour Coding:				
	AADT provided in the JNCC report (Chapman and Kite, 2021b)			
	Approximate AADT calculated from averaging AADT flows provided in the JNCC report for each distance band (Chapman and Kite, 2021b)			

127. As an example, whereby an affected road with an existing AADT of 5,000 is located 100m from the boundary of an ecological site (for which a Critical Load to a woodland feature of 10 kg-N.ha-1.yr^{-1} applies), a DMT of 7.5 vehicles applies (i.e. 0.15% of 5,000). However, the DMT is derived on a precautionary basis which assumes that a designated site is adjacent to the road concerned. It can be seen from **Table 26-19** that a change in AADT of 887 vehicles would be required to trigger the 1% exceedance of the N-dep Critical Load at the site boundary, for this particular example. In this example, if the predicted change in traffic along the road from the Projects is 150 AADT, it may be reasonable to assert that there is no credible evidence that the effects of other plans and projects would ever be such to lead to an overall change of 887 AADT over the lifetime of the Project, despite the fact that the DMT (7.5 vehicles) is exceeded.

128. The distances from ecological receptor boundaries to affected road edges has therefore been taken into consideration in the next stage of ecological receptor screening. AADT flows (inclusive of (a) project-generated traffic and (b) background 2019 to 2026 traffic growth) have been compared to those in **Table 26-18** and **Table 26-19**, and ecological receptors have been brought forward into the next stage of the ecological assessment if they exceeded thresholds corresponding to a 1% increase in the Critical Level or Load for the relevant habitat present in designated site.

129. **Table 26-20** details the road distance screening for DBS East or DBS West in isolation and DBS East and DBS West concurrently, respectively, and also identifies which sites have been brought forward for further consideration in the ecological assessment.

*Table 26-20 Critical Level and Critical Load 1% Screening of Ecological Receptors – DBS East or DBS West in Isolation and DBS East and DBS West in Concurrent Construction. Red filled cells indicate an exceedance of the AADT flows presented in **Table 26-18** and **Table 26-19**, and required further assessment of feature / site.*

Link	Designated Ecological Site		Distance from ARN link (m)	Feature Name or Critical Load Class	Woodland Present	Total AADT Change[1] (in Isolation)	Total AADT Change[1] (Concurrent)	AADT Required for 1% Critical Level or Load Increase (See Table 26-18 and Table 26-19)							Further Assessment Required?
								NOx	NH_3		N-dep				
	Site Type	Name						30 $\mu g.m^{-3}$	1 $\mu g.m^{-3}$	3 $\mu g.m^{-3}$	5 $kgN.ha^{-1}.yr^{-1}$	10 $kgN.ha^{-1}.yr^{-1}$	15 $kgN.ha^{-1}.yr^{-1}$	20 $kgN.ha^{-1}.yr^{-1}$	
4	SSSI	Skipsea Bail Mere[2]	0	No features sensitive to air quality impacts											No
5	SSSI	Skipsea Bail Mere[2]	100	No features sensitive to air quality impacts											No
6	SSSI	Skipsea Bail Mere[2]	138	No features sensitive to air quality impacts											No
26	SAC/ SSSI	Humber Estuary	9	Pioneer, low-mid, mid-upper saltmarshes	No	6,612	6,933	278	405	1,214	-	-	-	858	Yes
26	SAC	Humber Estuary	9	Mudflats and sandflats not covered by seawater at low tide	No	6,612	6,933	278	405	1,214	NC	NC	NC	NC	Yes
26	LNR	Humber Bridge	8	Broadleaved deciduous woodland	Yes	6,612	6,933	225	-	995	-[3]	-[3]	-[3]	-[3]	Yes
28	LNR	Humber Bridge	150	Broadleaved deciduous woodland (MAGIC)	Yes	4,127	4,675	2,410	-	6,980	-[3]	-[3]	-[3]	-[3]	Yes
29	SAC	Humber Estuary	5.5	Mudflats and sandflats not covered by seawater at low tide	No	2,432	2,603	171	259	776	NC	NC	NC	NC	Yes
29	LNR	Humber Bridge	35	Broadleaved deciduous	Yes	2,432	2,603	732	-	2,814	-[3]	-[3]	-[3]	-[3]	Yes

Link	Designated Ecological Site		Distance from ARN link (m)	Feature Name or Critical Load Class	Woodland Present	Total AADT Change[1] (in Isolation)	Total AADT Change[1] (Concurrent)	AADT Required for 1% Critical Level or Load Increase (See Table 26-18 and Table 26-19)							Further Assessment Required?
								NOx	NH_3		N-dep				
	Site Type	Name						30 $\mu g.m^{-3}$	1 $\mu g.m^{-3}$	3 $\mu g.m^{-3}$	5 $kgN.ha^{-1}.yr^{-1}$	10 $kgN.ha^{-1}.yr^{-1}$	15 $kgN.ha^{-1}.yr^{-1}$	20 $kgN.ha^{-1}.yr^{-1}$	
				woodland (MAGIC)											
62	SSSI	Burton Bushes	48	*Quercus Robur - Pteridium Aquilinum - Rubus Fruticosus* Woodland	Yes	731	851	917	1,145	3,434	-	-	909	1,212	No
62	Ancient Woodland	Burton Bushes	88	Broadleaved deciduous woodland (MAGIC)	Yes	731	851	1,269	1,468	4,403	-	-	1,120	1,493	No
63	Ancient Woodland	Unnamed woodland (ID1)	162	Coniferous woodland	Yes	2,898	-[4]	2,917	2,565	7,693	601	1,203	1,803	-	Yes
						-[4]	3,421	2,917	2,565	7,693	601	1,203	1,803	-	Yes

[1]AADT change shown are inclusive of project-generated traffic and in-combination traffic growth (from 2019 to 2026)
[2]Excluded from assessment as no feature(s) sensitive air quality impacts
[3]As the specific details of habitats within LNRs are not known, the habitat-specific Critical Loads were not assessed. Impacts on Critical Levels were considered.
[4]Screening for this site was split into separate rows for the 'in isolation' and 'concurrent construction' scenarios as the outcomes were different.
NC= No comparable habitat with established critical load estimate available

130. Only links with ecological receptors within 200m of the roads edge are presented in **Table 26-20**. Site-specific Critical Levels and Critical Loads are presented in **Table 26-26**, and these have been taken into consideration in the comparison to AADT flows shown in **Table 26-18** and **Table 26-19**.

131. Of the eight ecological sites initially identified (see **Table 26.2-3** in **Appendix 3**), five ecological sites have been brought forward for further assessment. This is because the AADT at the relevant distance from the road edge to the ecological site boundary exceeded those representative of greater than 1% increase in Critical Level and/or Load (see **Table 26-18** and **Table 26-19**,). Not all of the five ecological sites exceed the representative 1% AADT flows for all Critical Level and Critical Load values (for example, there may be an impact of greater than 1% of the nitrogen Critical Load but not the NOx Critical Level); therefore, ecological sites have only been assessed further for Critical Levels and/or Loads shown to be in exceedance of 1%. In addition, for some ecological sites not all of the designated features and Critical Load classes are exceeded, so only those in exceedance have been considered further in this assessment.

132. Following this detailed initial screening of ecological sites, those sites screened in for further assessment have been assessed for effects from traffic emissions using the guidance and methodology provided in the JNCC reports (Chapman and Kite, 2021a and 2021b). Table 11 of the JNCC Technical Report (Chapman and Kite, 2021b) provides changes in concentrations (2019) and fluxes (2015) that could reasonably be expected from an increase of 1,000 AADT on a typical road. The guidance also states that these can be scaled to represent alternative increases in traffic flows, for example an increase in 250 AADT results in 25% of the impact of the values shown in **Table 26-21**, which is a slightly amended version of Table 11 in the JNCC Technical Report.

133. This approach has been adopted to quantify increases in annual mean NOx and NH_3, and nitrogen deposition (N-dep) in this assessment. The relationship between N-dep and its acidifying potential is linear, so a 1kg $N.ha^{-1}.yr^{-1}$ reduction will always deliver a 0.07$keq.ha^{-1}.yr^{-1}$ reduction in acidity. Therefore, increases in nitrogen-driven acidity, i.e., those from road traffic vehicle emissions, is directly proportional to increases in N-dep (Chapman and Kite, 2021b). Acid deposition has therefore been quantified in the assessment by multiplying the N-dep concentration by 0.07.

Table 26-21 Change in Concentration (in 2019) and Flux (in 2015) for an Example Flow of 1,000 AADT in a Typical Vehicle Fleet (Chapman and Kite, 2021b) [Amended]

Distance from Road Edge (m)	Annual Mean NOx ($\mu g.m^{-3}$)	Annual Mean NH_3 ($\mu g.m^{-3}$)	N-Dep to Forest ($kgN.ha^{-1}.yr^{-1}$)	N-Dep to Short Vegetation ($kgN.ha^{-1}.yr^{-1}$)
1	2.5	0.109	1.41	0.85
5	1.8	0.039	0.58	0.34
5-10	1.45	0.032	0.49	0.285
10	1.1	0.025	0.4	0.23
10-25	0.825	0.0195	0.32	0.185
25	0.55	0.014	0.24	0.14
25-50	0.44	0.01135	0.2	0.1175
50	0.33	0.0087	0.16	0.095
50-100	0.26	0.00715	0.135	0.0795
100	0.19	0.0056	0.11	0.064
100-150	0.155	0.00495	0.1	0.0575
150	0.12	0.0043	0.09	0.051
150-200	0.1065	0.00395	0.0835	0.047
200	0.093	0.0036	0.077	0.043

Colour Coding:	
	Concentration/flux provided in the JNCC report (Chapman and Kite, 2021b)
	Approximate concentration/flux calculated from averaging concentration/flux provided in the JNCC report for each distance band (Chapman and Kite, 2021b)

26.4.3.3.7.4 DBS East or DBS West Alone Compared to In-combination Traffic Flows

134. As detailed at the beginning of this section, an in-combination assessment has been undertaken. To provide context around the proportion of AADT generated as a result of DBS East and/or DBS West, and that from other in-combination sources (background growth and cumulative projects), **Table 26-22** provides project-generated construction traffic flows, background traffic growth between 2019 (base year) and 2026, on all road links where a designated ecological site is present within 200m.

Table 26-22 DBS East or DBS West Project AADT Flows Compared to In-combination Project Flows Considered in the Assessment (2026)

Link	DBS East or DBS West in Isolation			DBS East and DBS West Concurrent Construction		
	Project AADT	In combination AADT	Project as % of Total	Project AADT	In combination AADT	Project as % of Total
26	667	6,612	10%	988	6,933	14%
28	994	4,127	24%	1,543	4,675	33%
29	251	2,432	10%	421	2,603	16%
63	1,031	2,898	36%	1,554	3,421	45%

135. As can be seen from **Table 26-22** , for the most part, DBS East and/or DBS West construction traffic contributes to approximately 10 to 36 %, if DBS East or DBS West are built in isolation and 14 to 45 % of the overall in-combination AADT when DBS East and DBS West are built concurrently.

136. Any development-generated or in-combination values above 1% of the Critical Load or Level requires additional assessment by an ecologist to determine whether any significant effects may be experienced at the affected habitats. The determination of the significance of effects associated with nutrient nitrogen/acid deposition and airborne NOx concentrations will be included in the Benthic Habitats and Terrestrial Ecology and Ornithology assessments at ES stage.

26.4.3.3.7.5 Haul Road Traffic

137. The potential impacts on designated ecological sites as a result of LDVs and HGVs travelling along the haul road have been considered.

138. The peak daily number of vehicles travelling along the haul road was calculated where the Onshore Development Area is within 200m of a designated ecological site, as described in section 26.4.3.3.2.

139. There are no ecological sites sensitive to exhaust emissions present within 200m of the possible landfall location. Therefore, the impact of haul road traffic at landfall has not been considered further.

140. In addition, the location of the haul road(s) within the substation zones is not known at this stage. Therefore, the impact of haul road traffic on ecological sites within 200m of the substation zones will be completed as part of the ES when the location of the substations and haul roads have been further refined.

141. The impact of haul road traffic along the cable route has therefore been considered as part of this assessment. The sensitive ecological receptors within 200m of the cable route are detailed in **Table 26-23**. The peak construction traffic flows for the haul road along the cable route were used to derive AADT flows for the purposes of the air quality assessment, which is considered to represent a conservative scenario.

Table 26-23 Traffic Flows on the Haul Road Within 200m of Designated Ecological Sites

Haul Road Traffic	**Designated Ecological Site**	**Distance from Onshore Development Area***	**Accesses**	**Peak Daily Flows Generated During Construction**	
				DBS East or DBS West in *isolation*	**DBS East and DBS West Concurrent Construction**
Cable Route	Burton Bushes SSSI	16m	A1174	133	182
	Burton Bushes Ancient Woodland				
*Worst case distance from haul road (as the haul road is unlikely to be adjacent to the closest boundary)					

142. As shown above, the number of vehicles travelling along the haul road do not exceed the screening criteria detailed in Table 26-18 and Table 26-19 that correspond to a 1% change in Critical Level or Load, at the respective distances from the (assumed worst case) haul road edge. As such, impacts on designated sites as a result of haul road traffic has not been considered further in the assessment, as they are considered to be insignificant.

26.4.4 Cumulative Effect Assessment Methodology

143. The CEA considers other plans and projects that may result in cumulative effects with the Projects. **Chapter 6 EIA Methodology** provides details of the general framework and approach to the CEA that will be undertaken for the Projects.

144. The final assessment of cumulative effects will be undertaken during the later stages of the EIA, once further information is available on a number of projects such as the Outer Dowsing Offshore Wind Farm, Hornsea Project Four decision and the Sheringham Shoal and Dudgeon Extension Projects examination. However, for the purposes of the PEIR, it is possible to identify a number of projects and plans which are likely to feature in that assessment and consider the extent to which cumulative effects might arise. Section 26.7 presents the following preliminary information regarding cumulative effects:

- Screening for cumulative effects; and
- A preliminary short list of plans and projects considered for CEA, including a brief description as to how projects have been screened in and the initial tier level they have been assigned.

26.4.5 Transboundary effects assessment methodology

145. There are no transboundary effects with regard to onshore air quality as the onshore development area is not sited in proximity to any international boundaries, and any effects would be localised. Transboundary effects are therefore scoped out of this assessment and not considered further.

26.4.6 Assumptions and Limitations

146. This preliminary assessment is considered to be an interim stage in the EIA process. The results presented in the following sections are based on early design assumptions and initial assessments which will be refined and presented in the final Environmental Statement (ES) to be submitted as part of the DCO application.

147. Traffic data has been utilised in the prediction of impacts at sensitive human and ecological receptor locations. Any assumptions made in the derivation of the traffic data are therefore applicable to the air quality assessment. For further details please refer to **Chapter 24 Traffic and Transport**.

148. Diffusion tube monitoring is a standard indicative monitoring method used by local authorities to measure air quality within their administrative areas. Diffusion tubes do not provide the same level of precision and accuracy as automatic monitoring methods; however, good quality assurance and quality control processes will minimise uncertainties insofar as possible. Furthermore, annual mean diffusion tube monitoring results are adjusted for bias using a factor derived using MCerts reference method monitoring equipment. The uncertainties and limitations to monitored air pollution data are therefore unlikely to significantly affect the certainty of the EIA.

149. Background pollutant concentrations within the air quality study area for PM_{10} and $PM_{2.5}$ have been derived using the pollution maps provided by Defra for 1km x 1km grid squares across the UK. These data are derived using an empirical model, calibrated using monitoring data from the UK Automatic Urban and Rural Network and, as such, there are inherent uncertainties associated with modelled data. However, the use of these maps is an industry-standard approach and has been agreed with stakeholders during consultation (see **Table 26-1**). Uncertainties in these mapped background values are unlikely to significantly affect the certainty of the EIA and the conclusions of the assessment.

150. The latest version of Defra's air quality assessment tools, including the background pollutant maps, are based on assumptions prior to the Covid-19 pandemic. As such, the tools do not reflect any short or long-term changes to emissions which may have occurred as a result of behavioural change during the pandemic.

26.5 Existing Environment

151. A desk-based review has been undertaken to determine the air quality baseline within the study area.

152. The characterisation of the existing environment has been undertaken using data sources listed in **Table 26-8.** The baseline data sources are sufficient to provide an assessment of potential air quality impacts arising from the Projects and have been agreed with East Riding of Yorkshire Council and Hull during technical engagement (pers. comm., 9 and 14 Dec 2022).

26.5.1 Local Air Quality Management (LAQM)

153. As stated in its Annual Status Report for 2022 (East Riding of Yorkshire Council, 2022), East Riding of Yorkshire Council has not declared any statutory AQMAs within its area of jurisdiction.

154. The air quality study area extends into the jurisdiction of Hull City Council, which has declared a statutory AQMA for exceedances of the NO_2 annual mean around the A63 trunk road which runs through the centre of the city (Hull City Council, 2022). The air quality study area falls within the AQMA.

26.5.2 Air Quality Monitoring Data

155. Recent monitoring data within the East Riding of Yorkshire Council administrative area show that concentrations of NO_2 are below the annual mean Objective at locations of relevant exposure.

156. Recent air quality monitoring data collected by Hull City Council show that NO_2 concentrations within the AQMA area continue to be above the annual mean Objective in some locations, which is mainly due to road traffic emissions from the A63 trunk road. Furthermore, a row of residential properties to the east of the AQMA, along the A1033 Hedon Road, has also experienced elevated pollutant concentrations in recent years and is therefore an additional area of consideration with regard to air quality. These areas are located within the air quality study area and have therefore been considered within the assessment.

157. The NO_2 diffusion tube monitoring within the 200m of the road network have been listed **Table 26-24** and results show that the annual mean NO_2 Objective of 40µg.m^3 has been not exceeded at any diffusion tube location across the five-year period for both the local authorities, except for at two diffusion sites in Hull City Council (S14 in 2017 and 2018 and at S36 in 2017 only). Monitoring data from 2020 and 2021 should be treated with caution as the Covid-19 pandemic had a significant impact on traffic levels as well as low levels of data capture. Despite this, monitoring still indicates a declining trend in annual mean concentrations of NO_2 since at least 2017.

158. East Riding of Yorkshire Council and Hull do not undertake any monitoring of PM_{10} or $PM_{2.5}$ within the air quality study area.

Table 26-24 Annual Mean NO_2 Monitoring Undertaken by East Riding of Yorkshire Council and Hull City Council

Site ID	Location	Site Type	Monitored Annual Mean NO_2 Concentration ($\mu g.m^{-3}$)				
			2017	2018	2019	2020	2021
East Riding of Yorkshire Council							
S12	Dunoon, Main Street, Skipsea	Kerbside	-	-	-	-	10
S26	Albion Court/Grovehill Rd. Roundabout, Beverie	Kerbside	23	21	19	16.6	17.9
S27	Hull Rd (No. 3), Saltend	Kerbside	31	27	27	22.6	23.5
S30	Swinemoor Lane / Barmston Road, Beverie	Kerbside	26	26	23	19.9	22.1
S33	Swinemoor Lane No. 9 , Beverie	Kerbside	35	34	29	23.7	26.6
S35	A63 East (The Old Found, Welton	Kerbside	18	18	17	13.4	14.6
S48	Hull Rd/Grovehill Rd. Roundabout, Beverie	Kerbside	-	-	-	-	17.6
Hull City Council							
S2	Humber Dock Street	Kerbside	25.3	23.7	25.9	21.4	23.1
S3	Courtney Street	Kerbside	33.5	33.5	30.6	-	17.9

Site ID	Location	Site Type	Monitored Annual Mean NO_2 Concentration ($\mu g.m^{-3}$)				
			2017	2018	2019	2020	2021
S4	Spruce Road	Roadside	33.5	33.5	30.6	23.6	18.1
S5	Tadman Street	Kerbside	30.2	28.8	26	22.9	24.6
S8, S9, S10	ABP Hull C (moved 7/8/2020)	Industrial	-	-	-	19.5	23.7
S11	Daltry St	Roadside	30.7	28.8	29.5	23	24.9
S13	Princes Dock Side	Roadside	34.1	37.7	36.9	30.3	27.8
S14	Castle st (Road)	Kerbside	46.8	41.5	36.3	26.1	26.4
S15	Castle st (Wall)	Urban Centre	35.9	33.2	31.5	30.7	32.8
S25	Ashcombe Rd	Roadside	23.4	21.3	19.6	15.2	16.3
S30	Plimsoll Way	Roadside	23.9	24.9	23.6	18.3	20.2
S31	Hedon Rd (Road)	Kerbside	26.2	24.2	23.8	19.9	20.2
S32	Southcoates Lane	Kerbside	25.9	27.5	26.5	24.6	22.2
S35	Blanket Row 2	Roadside	20.6	19.2	19.7	15.8	16.1
S36	Hedon Road/Marfleet	Roadside	47.2	39.1	36.7	31.9	30.5
S37	Hedon Road/Valetta St	Background	35.3	34.6	34.3	28.5	32.2
S44	Hall Rd - Marfleet Junction (7/7)	Kerbside	22.4	35.4	29.8	27.4	26.4
S48	Stoneferry Road	Kerbside	38	34.2	34.6	29.8	27

Site ID	Location	Site Type	Monitored Annual Mean NO_2 Concentration ($\mu g.m^{-3}$)				
			2017	2018	2019	2020	2021
S51	Glebe Rd	Kerbside	39.3	39.5	38.2	32.7	33.4
S98	126, Holderness Rd	Kerbside	-	-	-	-	24.9
S99	Craven St	Kerbside	-	-	-	-	24.6
S100	230 Holderness Rd	Kerbside	-	-	-	-	26.4
S101	East Park Ave	Kerbside	-	-	-	-	21.1
S102	620 Holderness Rd	Kerbside	-	-	-	-	22
S103	Hold AQMS	Kerbside	-	-	-	-	24.4
S104	Southcoates Ln Estcourt	Kerbside	-	-	-	-	25.7
S120	Rivaulx Court	Kerbside	-	-	-	-	30.6
S121	Woodhall St	Kerbside	-	-	-	-	26
S122	Bedford St	Kerbside	-	-	-	-	24.6

-Data not available

Bold values indicate exceedance of air quality Objective

26.5.3 Identification of Receptors

26.5.3.1 Construction Phase Dust and Fine Particulate Matter

159. IAQM guidance (IAQM, 2016) states that a detailed assessment is required where there are human receptors within 350m of the site boundary and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s). Internal guidance from Natural England recommends that ecological receptors within 200m of a site should be considered in a construction dust and fine particulate matter assessment, as opposed to only those ecological sites within 50m of the site (as stated in IAQM guidance).

160. The onshore export cable corridor from landfall at Skipsea to the onshore substation zones to the south-west of Beverley was assessed (see **Figure 26-2**). The precise location of the onshore substations and grid connection point are subject to ongoing consultation therefore the worst case location (i.e. anywhere within the onshore substation zones) has been assessed.

161. The construction dust and fine particulate matter assessment has been undertaken using a worst case scenario whereby the maximum amount of works (e.g. cable trenching, a construction compound, jointing bay and link box construction) are undertaken in proximity to the greatest number of human and ecological receptors, as set out below. Recommended mitigation measures for these worst case locations would then be applied to all onshore construction works, to provide a conservative assessment.

162. Receptor locations have been identified in the areas closest to the potential maximum impacts due to construction within the Onshore Development Area (as defined in **Table 26-2**) within the study area. The identified receptors are set out in the following sections.

26.5.3.1.1 Human Receptors

163. There are human receptors within 350m of the Onshore Development Area located in north and south Beverley, Routh, and Skipsea, with additional isolated farmsteads located along the cable route.

164. As detailed in **Appendix 26.1**, the number of receptors potentially exposed to dust impacts is a factor that determines the receptor sensitivity. For DBS East and/or DBS West, the area with the most human receptors within 350m of the Onshore Development Area is in the north of Beverley.

165. At present, the Onshore Development Area is the subject of ongoing refinement; however, the current proposed locations for the construction compounds are as follows:

- Landfall;
- North-west of Dunnington;
- North of Catfoss;
- Sigglesthorne;
- Long Riston;
- Routh;
- Multiple locations surrounding Beverley; and
- Onshore substations.

166. The proximity of construction compounds to receptors has been taken into the consideration within the design of the Projects and, therefore, the number of human receptors within 100m of the proposed construction compounds are limited. The following construction compounds have residential properties within 100m:

- Landfall;
- North of Beverley;
- South-west of Beverley;
- North of Catfoss;
- Routh; and
- Onshore Substations.

167. The construction compound located nearest the highest concentration of human receptors is located to the north of Beverley adjacent to the A1035 with between 10 to 100 receptors up to 100m from the construction compound boundary.

168. The location of maximum impact along the onshore export cable corridor, i.e. dustiest activities and greatest number of receptors within close proximity of the construction works, has been determined to be to the north of Beverley adjacent to the A1035. Therefore, this area has been the focus of the construction dust assessment for human receptors along the onshore export cable corridor, to provide a conservative assessment, as the combined sources of dust from both the construction compounds and cable trenching activities is considered to represent the worst case in terms of dust impact magnitude. Impacts of construction dust at landfall and the onshore substations have been considered in the assessment separately, due to the large Onshore Development Area.

169. There are other areas along the onshore export cable corridor where human receptors are present within 350m of the Onshore Development Area; however, these receptors would either be further away from construction works relating to the worst case scenario mentioned above, or closer to a reduced level of construction works (i.e. close to cable trenching but away from a construction compound). It is therefore anticipated that the sensitivity of these receptors would be equal to, or less than, those located at landfall, in the north of Beverley or the onshore substation zones (**Appendix 26.1** provides further details on how the sensitivity of human receptors to dust soiling and human health impacts are determined).

170. It should be noted that the mitigation measures identified to suppress dust emissions (see section 26.6.1.1.5) would be applied across the onshore works and are not only applicable as mitigation for those receptors included within the assessment. As such, the assessment is considered to be robust.

26.5.3.1.2 Ecological Receptors

171. Designated ecological receptors that may be sensitive to dust impacts within 200m of the onshore construction works (or within 50m of access routes) are identified in **Table 26-25;** as well as the distance each ecological site is from the Onshore Development Area. **Figure 26-2** shows the location of the ecological receptors listed in **Table 26-25.**

Table 26-25 Designated Sites within 200m of the Onshore Development Area

Designated Ecological Site	Distance from Onshore Development Area
Birkhill Wood Ancient Woodland	0m from Onshore Development Area
Unnamed Ancient Woodland	Located within the indicative Substation Zone 4. 0m from indicative temporary construction compound associated with Substation Zone 4, 30m from the indicative location of the substation within Zone 4
Beverley Parks LNR	0m from Onshore Development Area
Burton Bushes SSSI & Ancient Woodland	20m from Onshore Development Area

172. As detailed in section 26.4.3.1, three different construction activities are considered in a dust assessment: earthworks, construction and trackout. Burton Bushes SSSI and Ancient Woodland has been chosen as the worst case ecological receptor location for dust from earthworks, construction and trackout activities, as it is located in close proximity to a potential construction compound as well as the onshore export cable corridor and may be sensitive to dust. Its national designation also makes it more sensitive in accordance with IAQM guidance (IAQM, 2016).

26.5.3.2 Construction Phase NRMM Emissions Assessment

26.5.3.2.1 Landfall

173. There are two indicative landfall HDD construction compounds. The closest human receptors to the northern compound are the caravan parks located off Hornsea Road and Green Lane, approximately 50m to the south and north respectively. The closest human receptor to the southern proposed construction compound is a residential property 80m to the west. There are no ecological receptors sensitive to exhaust emissions located within 200m of the possible landfall location.

26.5.3.2.2 Onshore Cable Export Corridors

174. The closest human receptors to the works along the onshore export cable corridor include the residential areas in the north and south-west of Beverley. The closest ecological receptors to the onshore export cable corridor works which may require NRMM (i.e., anywhere within the onshore export cable corridor) is the Burton Bushes SSSI and Ancient Woodland located 20m from the indicative Onshore Development Area**.**

26.5.3.2.3 Onshore Substations

175. There are two indicative substation zones located to the south of Beverley. The nearest human receptors to the indicative Substation Zone 4 are the residential properties in Bentley adjacent to the south. The nearest ecological receptor is the unnamed Ancient Woodland located within the indicative Onshore Development boundary.

176. The closest human receptors Substation Zone 1 are residential properties located to the north of A164 approximately 20m west of the indicative boundary. The nearest ecological receptor is Beverley Parks LNR located adjacent to the east.

177. The worst case location for impacts from NRMM emissions during construction of the substation is therefore the proposed Substation Zone 4.

26.5.3.3 Construction Phase Road Traffic Emissions Assessment

26.5.3.3.1 Human Receptors

178. Existing sensitive receptor locations have been identified within the air quality study area for consideration in the assessment. Predicted changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations as a result of project-generated traffic has been calculated at these locations.

179. The sensitive receptor locations are selected based on their proximity to road links affected by the Projects (as identified within **Chapter 24 Traffic and Transport)** where the potential effect of development-generated traffic emissions on local air pollution would be most significant, including within the Hull AQMA. This includes residential dwellings, schools and hospitals. The Hull City Council Air Quality Officer requested that the assessment should include the whole area within the administrative boundary of Hull City Council, not just the AQMA (pers. comm., 9 January 2023). Therefore, sensitive receptor locations have been included adjacent to all roads which exceed the IAQM and EPUK screening criteria (IAQM and EPUK, 2017).

180. Other receptors within 200m of the assessed road network may also experience changes in pollutant concentrations, but to a lesser degree than those considered.

181. Thirteen additional road links were screened into the concurrent construction scenario compared to the in isolation scenario, see **Table 26-9**. Therefore, results for the receptors on the additional road links screened in for the concurrent scenario were not reported in the in isolation scenario.

182. Receptors have been included in the dispersion model at a height of 1.5m to represent expected exposure (breathing height). All modelled receptors are representative of residential exposure.

183. The sensitive receptor locations are detailed in **Table 26.3-1** presented in **Appendix 26.3** and shown in **Figure 26-3**.

26.5.3.3.2 Designated Ecological Sites

184. A number of designated ecological sites are located within 200m of roads which are anticipated to experience increases in construction-related traffic flows above the criteria detailed in **Table 26-9.** The designated ecological sites that have been screened into the assessment (i.e. within 200m of ARN links) are detailed in **Table 26.3-2** presented in **Appendix 26.3,** as well as reasoning for the exclusion of certain sites, and whether or not sites have been considered further in the assessment for exceeding the AADT flows (at the distance from the site boundary to the road edge) required to result in a 1% increase in the site-relevant Critical Level and/or Load.

185. Further details on this are provided in section 26.4.3.3.7. The designated ecological sites are listed in **Table 26.3-2** presented in **Appendix 26.3** and also shown in **Figure 26-4**.

186. The APIS website (CEH, 2023) has been consulted to identify any habitats or features of these designated sites that are sensitive to nutrient nitrogen and acid deposition. Where sensitive habitats or features have been found, the Critical Loads for nutrient nitrogen and acid deposition have been obtained. A full list of the designated ecological sites and associated Critical Level and Load values that have been considered is presented in **Table 26-26**. The most sensitive habitat types have been included to provide a conservative assessment. LNRs have been assessed against Critical Levels only as Critical Loads are not provided for LNRs on the APIS website (CEH, 2023)

187. It should be noted that there have been revisions of the empirical critical loads of nitrogen established for Europe in 2011 under the umbrella of the UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP) (GEA, 2022). However, at the time of writing this report, these values are yet not adopted on APIS and hence the Critical Loads from APIS website (CEH, 2023) have been considered.

Table 26-26 Designated Ecological Sites and Critical Load Values

Link(s)	Designated Ecological Site			Critical Level		Critical Load						
	Site Type	Name	Feature Name or Critical Load Class	NOx	NH_3	N-dep	Acid Deposition					
							MinCL MinN	MinCL MaxN	MinCL MaxS	MaxCL MinN	MaxCL MaxN	MaxCL MaxS
				$\mu g.m^{-3}$		$kgN.ha^{-1}.yr^{-1}$	$kgN.ha^{-1}.yr^{-1}$					
26	SAC/SSSI	Humber Estuary	Pioneer, low-mid, mid-upper saltmarshes*	30	1 to 3	20 to 30	NS	NS	NS	NS	NS	NS
26	SPA/SSSI	Humber Estuary	Pioneer, low-mid, mid-upper saltmarshes*	30	3	20 to 30	NS	NS	NS	NS	NS	NS
26 and 29	SAC	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide	30	1 to 3	NC	NS	NS	NS	NS	NS	NS
26, 28 and 29	LNR	Humber Bridge	Broadleaved deciduous woodland (MAGIC)	30	3	-**	-**	-**	-**	-**	-**	-**
62	SSSI	Burton Bushes	*Quercus Robur – Pteridium Aquilinum – Rubus Fruticosus* Woodland	30	1 to 3	15 to 20	0.142	11.003	10.861	0.142	10.993	10.851
62	Ancient Woodland	Burton Bushes	Broadleaved deciduous woodland (MAGIC)	30	1 to 3	15 to 20	0.142	11.003	10.861	0.142	10.993	10.851
63	Ancient Woodland	Unnamed woodland (ID1)	Coniferous woodland	30	1 to 3	5 to 15	0.142	10.993	10.851	0.142	10.993	10.851

*Designated ecological site may be repeated in the table as a feature may have more than one Critical Level or Critical Load within them

**Critical Loads were not assessed for LNRs as information regarding the specific habitats present within them was not available

NC= No comparable habitat with established critical load estimate available; NFF = No features found; NS = Not Sensitive

26.5.4 Background Pollutant Concentrations

26.5.4.1 Human Receptors

188. The approach to deriving appropriate background pollutant concentrations for the assessment is set out in section 26.4.3.3.4. The background concentrations used in the assessment are provided in **Table 26-27**.

Table 26-27 Background Pollutant Concentrations

Receptor ID	2019 Concentration (µg.m^{-3})			2026 Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
Hull City Council						
R1	20.7	16.0	10.1	16.3	14.9	9.3
R2	20.7	16.0	10.1	16.3	14.9	9.3
R30	19.6	15.3	9.8	15.7	14.3	9.0
R31	18.0	15.4	9.6	14.6	14.4	8.8
R32	18.0	15.4	9.6	14.6	14.4	8.8
R33	23.9	14.7	9.4	20.2	13.7	8.6
R34	19.3	16.6	10.8	15.1	15.5	10.0
R35	19.3	16.6	10.8	15.1	15.5	10.0
R36	18.4	15.5	10.4	15.0	14.4	9.5
R37	17.8	15.6	10.2	14.5	14.5	9.3
R38	17.8	15.6	10.2	14.5	14.5	9.3
R39	17.8	15.6	10.2	14.5	14.5	9.3
R40	20.4	16.1	10.6	17.1	14.7	9.4
R41	14.1	15.5	9.6	11.3	14.5	8.8
R42	14.1	15.5	9.6	11.3	14.5	8.8
R43	17.5	15.8	10.6	14.0	14.7	9.8

Receptor ID	2019 Concentration (µg.m^{-3})			2026 Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R44	15.1	14.5	9.5	12.1	13.5	8.7
East Riding of Yorkshire Council						
R3	14.3	14.8	9.0	10.7	13.8	8.3
R4	14.3	14.8	9.0	10.7	13.8	8.3
R5	14.3	14.8	9.0	10.7	13.8	8.3
R6	12.5	15.5	9.1	9.4	14.5	8.3
R7	10.5	15.7	8.7	8.3	14.7	7.9
R8	9.3	15.4	8.5	7.4	14.5	7.8
R9	10.2	14.3	8.3	8.1	13.4	7.6
R10	10.6	15.1	8.5	8.5	14.1	7.7
R11	10.0	15.4	8.5	7.7	14.5	7.8
R12	9.3	14.6	8.3	7.3	13.7	7.6
R13	9.3	14.7	8.3	7.4	13.8	7.6
R14	9.3	14.7	8.3	7.4	13.8	7.6
R15	10.4	13.9	8.5	8.3	12.9	7.8
R16	10.4	13.9	8.5	8.3	12.9	7.8
R17	10.3	13.3	8.1	8.2	12.4	7.4
R18	8.8	14.5	8.1	7.0	13.7	7.4
R19	8.2	14.5	8.0	6.5	13.6	7.3
R20	8.2	15.2	8.2	6.5	14.3	7.5
R21	8.2	14.4	8.0	6.8	13.6	7.3

Receptor ID	2019 Concentration (µg.m^{-3})			2026 Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R22	6.5	14.7	7.8	5.3	13.8	7.1
R23	6.5	14.6	7.8	5.3	13.7	7.1
R24	10.1	15.4	8.6	8.1	14.4	7.8
R25	10.0	15.4	8.5	7.7	14.5	7.8
R26	9.1	15.5	8.4	7.1	14.6	7.7
R27	9.1	15.5	8.4	7.1	14.6	7.7
R28	7.8	15.2	8.1	6.2	14.3	7.4
R29	7.8	15.2	8.1	6.1	14.3	7.4
R45	12.1	14.9	9.0	9.8	14.0	8.3
R46	8.6	15.3	8.4	7.0	14.3	7.7
R47	7.6	14.9	8.1	6.1	14.0	7.4
R48	7.7	14.9	8.1	6.1	14.0	7.4
R49	6.0	14.0	7.6	4.9	13.2	7.0
R50	8.0	15.2	8.2	6.4	14.3	7.5
R51	6.0	13.7	7.6	4.9	12.9	6.9
R52	6.2	13.2	7.5	5.1	12.4	6.8
R53	7.0	14.5	7.8	5.6	13.6	7.1
R54	8.2	15.2	8.2	6.5	14.3	7.5
R55	10.3	13.3	8.1	8.2	12.4	7.4
R56	8.5	15.5	8.3	6.6	14.7	7.6
R57	6.2	14.2	7.6	5.0	13.3	7.0

Receptor ID	2019 Concentration (µg.m^{-3})			2026 Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R58	7.0	14.5	7.8	5.6	13.6	7.1
R59	6.3	13.9	7.6	5.0	13.1	6.9
R60	6.2	13.2	7.5	5.1	12.4	6.8
R61	6.3	14.5	7.8	5.1	13.6	7.1
R62	8.0	15.2	8.2	6.4	14.3	7.5
R63	8.5	13.9	8.0	6.7	13.1	7.3

189. As detailed in **Table 26-27**, background pollutant concentrations are 'well below' (e.g., less than 75% of) the relevant air quality Objectives. Background concentrations predicted in East Riding of Yorkshire Council administrative boundary are lower than those in the administrative boundary of Hull City Council. This is to be expected as East Riding of Yorkshire is largely rural in nature.

26.5.4.2 Ecological Receptors

190. Background concentrations considered in the ecological assessment are provided in **Table 26-28**.

Table 26-28 Ecological Receptors – Background Pollutant Concentrations and Deposition Rates

Link	Designated Ecological Site		2026 Defra Mapped Concentration (Defra, 2020a)	2018-2020 data from APIS (CEH, 2023)		
	Site Type	Name	NOx	NH_3	N-Dep	Acid Dep
			µg.m^{-3}	µg.m^{-3}	kgN.ha^{-1}.yr^{-1}	kgN.ha^{-1}.yr
26	SAC	Humber Estuary	14.7	2.8	23.9	1.7
29	SAC	Humber Estuary	14.1	3.1	25.7	1.8
26	SPA/SSSI	Humber Estuary	14.7	2.8	23.9	1.7
26	SSSI	Humber Estuary	14.6	2.8	23.9	1.7
26	SSSI	Humber Estuary	14.1	2.8	23.9	1.7
62	SSSI	Burton Bushes	7.8	2.5	38.2	2.7
4	SSSI	Skipsea Bail Mere	6.3	2.7	21.4	1.5
5	SSSI	Skipsea Bail Mere	6.5	2.6	21.3	1.5
6	SSSI	Skipsea Bail Mere	6.3	2.6	21.3	1.5
26/29	LNR	Humber Bridge	14.1	3.1	43.5	-

Link	Designated Ecological Site		2026 Defra Mapped Concentration (Defra, 2020a)	2018-2020 data from APIS (CEH, 2023)		
	Site Type	Name	NOx	NH_3	N-Dep	Acid Dep
			µg.m^{-3}	µg.m^{-3}	kgN.ha^{-1}.yr^{-1}	kgN.ha^{-1}.yr
28	LNR	Humber Bridge	13.7	3.1	44	-
62	Ancient Woodland	Burton Bushes	7.8	2.5	38.2	-
63	Ancient Woodland	Unnamed woodland (ID1)	9.9	2.47	37.8	-
-No available data						

26.5.4.3 Onshore Development Area

191. The background concentrations used in the construction phase NRMM emission assessment are provided in in **Table 26-29.**

Table 26-29 Defra (2020a) Background Pollutant Concentrations Along the Onshore Development Area

Onshore Works (Landfall, Onshore Export Cable Corridor and Onshore Substation) Background Concentrations 2026 (µg.M^{-3})		
NO_2	PM_{10}	$PM_{2.5}$
4.9 – 10.7	12.4 – 14.7	7.0 – 8.3

192. As detailed in **Table 26-29**, background pollutant concentrations are 'well below' (e.g., less than 75% of) the relevant air quality Objectives across the Onshore Development Area.

26.5.5 Baseline Road Traffic Emissions

193. The ADMS-Roads model has been used to estimate contributions of vehicle exhaust emissions to annual and short term NO_2, PM_{10} and $PM_{2.5}$ concentrations for the 2019 base year and the 2026 'without DBS East or DBS West' assessment. The 24-hour AADT flows, and HGV percentages used in the assessment are detailed in **Appendix 26.2.**

194. **Table 26-30** provides the results of the baseline assessment for the base year (2019) and the earliest year of construction 'without DBS East or DBS West' (2026), which is inclusive of background concentrations as well as the traffic contribution.

Table 26-30 Baseline Road Traffic Emissions Assessment Base Year (2019) and Earliest Year of Construction (2026) 'Without DBS East or DBS West'

Receptor ID	Base year 2019 Concentration (µg.m^{-3})			Year of Peak Construction 2026 "Without DBS East or DBS West" Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
Hull City Council						
R1	41.5	20.9	13.0	26.7	20.1	12.1
R2	34.2	18.7	11.7	22.9	17.7	10.8
R30	26.4	16.6	10.6	18.9	15.6	9.7
R31	22.4	16.2	10.1	16.7	15.2	9.3
R32	23.6	16.4	10.2	17.3	15.4	9.4
R33	28.0	15.6	9.9	22.3	14.6	9.1
R34	24.1	17.5	11.4	17.5	16.4	10.5
R35	22.8	17.2	11.2	16.8	16.1	10.3
R36	31.0	18.0	11.9	21.4	17.0	11.0
R37	25.9	16.8	10.9	18.5	15.8	10.0
R38	29.0	17.2	11.1	20.0	16.2	10.2
R39	36.8	18.3	11.8	24.1	17.3	10.9

Receptor ID	Base year 2019 Concentration (µg.m^{-3})			Year of Peak Construction 2026 "Without DBS East or DBS West" Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R40	27.4	17.2	11.3	20.6	15.8	10.0
R41	21.6	16.8	10.4	15.2	15.8	9.6
R42	17.6	16.3	10.0	13.1	15.3	9.2
R43	22.6	16.8	11.2	16.6	15.8	10.3
R44	19.9	15.4	10.1	14.6	14.4	9.3
East Riding of Yorkshire Council						
R3	34.2	18.4	11.2	20.5	17.5	10.3
R4	34.2	18.4	11.2	20.6	17.5	10.3
R5	26.7	17.0	10.3	16.7	16.0	9.5
R6	37.1	20.2	11.8	21.5	19.3	10.9
R7	17.6	16.8	9.3	11.7	15.8	8.6
R8	15.9	16.7	9.3	10.7	15.8	8.5
R9	19.0	16.1	9.3	12.5	15.2	8.5
R10	17.5	16.5	9.3	12.0	15.6	8.5
R11	21.0	17.7	9.9	13.5	16.9	9.1
R12	23.4	17.5	9.9	14.7	16.7	9.2
R13	11.1	15.0	8.5	8.3	14.1	7.8
R14	13.4	15.3	8.7	9.5	14.4	8.0
R15	15.8	14.9	9.1	11.0	14.0	8.4
R16	23.4	15.8	9.6	14.9	14.8	8.8

Receptor ID	Base year 2019 Concentration (µg.m^{-3})			Year of Peak Construction 2026 "Without DBS East or DBS West" Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R17	13.8	14.0	8.5	10.0	13.1	7.8
R18	21.4	17.3	9.7	13.6	16.5	9.0
R19	19.8	17.0	9.5	12.5	16.2	8.8
R20	24.1	18.4	10.1	14.9	17.6	9.3
R21	14.2	15.1	8.4	9.9	14.2	7.7
R22	12.9	15.4	8.3	8.5	14.5	7.5
R23	17.1	15.7	8.5	10.6	14.9	7.8
R24	15.5	16.4	9.2	10.8	15.5	8.4
R25	17.8	16.7	9.3	11.6	15.8	8.5
R26	18.5	17.1	9.4	12.1	16.3	8.6
R27	13.9	16.3	8.9	9.6	15.4	8.2
R28	13.3	16.3	8.8	8.9	15.5	8.1
R29	13.7	16.4	8.9	9.1	15.6	8.2
R45	15.8	15.6	9.4	11.7	14.7	8.7
R46	17.6	16.6	9.3	11.6	15.7	8.5
R47	13.6	15.8	8.6	9.3	14.9	7.9
R48	21.5	16.9	9.2	13.0	16.0	8.5
R49	7.5	14.2	7.8	5.7	13.4	7.1
R50	12.2	16.0	8.7	8.7	15.1	8.0
R51	6.9	13.8	7.6	5.5	13.0	7.0

Receptor ID	Base year 2019 Concentration (µg.m^{-3})			Year of Peak Construction 2026 "Without DBS East or DBS West" Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R52	8.2	13.5	7.6	6.4	12.7	6.9
R53	13.1	15.3	8.3	9.3	14.4	7.6
R54	13.3	16.0	8.7	8.9	15.1	7.9
R55	16.5	14.3	8.7	11.3	13.3	7.9
R56	11.4	16.0	8.6	8.2	15.2	7.9
R57	10.7	14.9	8.1	8.2	14.0	7.4
R58	12.3	15.6	8.4	9.4	14.8	7.8
R59	10.1	14.5	7.9	7.7	13.7	7.2
R60	7.4	13.4	7.6	5.9	12.6	6.9
R61	7.2	14.6	7.9	5.7	13.7	7.2
R62	11.7	15.9	8.7	8.7	15.1	7.9
R63	12.5	14.8	8.5	9.5	13.9	7.8

195. As detailed in **Table 26-30**, annual mean concentrations of NO_2 are predicted to exceed the air quality Objective at receptor R1 in 2019. Receptor R1 is located adjacent to the A63. Elevated concentrations of NO_2 have been recorded along the A63 in 2019 by both Hull City Council and East Riding of Yorkshire Council. Annual mean concentrations of NO_2 are predicted to be below the air quality Objective at all receptor locations in 2026.

196. PM_{10} and $PM_{2.5}$ concentrations are predicted to be below the relevant Objectives at all receptors in both baseline years.

197. All predicted NO_2 concentrations are 'well below' 60µg.m^{-3} and therefore, in accordance with Defra guidance (Defra, 2022b), the 1-hour mean Objective is unlikely to be exceeded (see **Table 26-5**). The short term PM_{10} Objective has been predicted to be met at all modelled locations (Objective being less than 35 exceedances of the daily mean Objective of 50 µg.m^{-3}).

26.5.6 Future Trends

198. In the event that the Projects are not developed, an assessment of future conditions for air quality has been carried out and is described within this section.

199. The baseline review of air quality in section 26.5.2and 0, provide a clear indication that air quality in the Projects' air quality study area is generally good, which is to be expected in an area which is largely rural in nature, with areas of air quality concern and monitoring confined to urban areas. Air quality is managed, and improvement driven, by EU, UK and local legislation and policies. The UK's national air quality strategy and standards are enacted locally through management actions at a local authority level including a LAQM framework, as detailed in section 26.4.1. There is a policy trend towards the achievement and maintenance of good air quality across the UK, which is reflected in the local planning policies also detailed in section 26.4.1.

200. Air pollution in the study area is generally dominated by emissions from road vehicles. The quantity and composition of vehicle emissions is dependent on the type of fuel used, engine type, size and efficiency, vehicle speeds and the type of exhaust emissions abatement equipment employed. As such, it is anticipated that future pollutant concentrations will be reduced from baseline levels, as reflected in the predicted background concentrations provided by Defra, shown in **Table 26-27**.

26.6 Assessment of Significance

26.6.1 Potential Effects During Construction

26.6.1.1 Impact 1 Construction Dust and Fine Particulate Matter

201. A qualitative assessment of construction phase dust and PM_{10} emissions has been carried out in accordance with the latest IAQM guidance (IAQM, 2016). Full details of the methodology and dust assessment undertaken are provided in **Appendix 26.1**.

202. The onshore construction works associated with DBS East and/or DBS West have the potential to impact on local air quality conditions as described below:

- Dust emissions generated by excavation, construction and earthworks activities have the potential to cause nuisance to, and soiling of, sensitive receptors (see section 26.5.3.1 for further details on the identification of sensitive receptors);
- Emissions of exhaust pollutants, especially NOx and PM_{10} from construction traffic on the local road network, have the potential to impact upon local air quality at sensitive receptors situated adjacent to the routes utilised by construction vehicles; and
- Emissions of NOx and PM_{10} from on-site plant, termed NRMM, operating within the Onshore Development Area have the potential to impact local air quality at sensitive receptors in close proximity to the works.

203. The assessment consisted of four steps (Step 1, Step 2A, Step 2B and Step 2C) as outlined below.

204. Further details are provided in section 26.5.3.1 on the focus areas for the assessment in relation to the locations of the expected worst case construction works (i.e. landfall, the north of Beverley and the onshore substation zones for human receptors and Burton Bushes SSSI and Ancient Woodland for ecological receptors).

205. Both concurrent and sequential construction have similar potential for generating construction dust and fine particulate matter impacts on receptors, as overall they both cover the maximum footprint of construction works. However, the sequential build may result in the same area of land being affected twice, which would affect the duration of impacts. The duration of construction works is not explicitly accounted for within the IAQM assessment methodology (IAQM, 2016). It is therefore anticipated that the magnitude of impacts of the sequential scenario would be no greater than concurrent scenario and so is not considered further in the assessment.

26.6.1.1.1 Step 1: Screen the Need for a Detailed Assessment

26.6.1.1.1.1 All Scenarios

206. The IAQM guidance states that a detailed assessment is required if there are human receptors located within 350m and ecological receptors within 200m (internal Natural England guidance) of the Onshore Development Area. Human and ecological receptors are present within 350m and 200m respectively of the Onshore Development Area, therefore a detailed assessment was required.

26.6.1.1.2 Step 2A: Define the Potential Dust Emission Magnitude

207. The IAQM guidance recommends that the dust emission magnitude is determined for demolition, earthworks, construction and trackout. It is anticipated that no buildings/structures would be demolished as part of construction of DBS East and/or DBS West, therefore demolition has not been considered in the assessment.

208. The landfall, onshore export cable corridor and the onshore substations have been assessed separately, due to the spatial scale of the Projects (see **Figure 26-2**). The worst case scenarios for human and ecological receptors have been identified based on the number of receptors within 350m and 200m of the Onshore Development Area respectively. For trackout activities, receptors within 50m from the construction vehicle routes up to 500m from the Onshore Development Area have been considered, as this distance "*takes account of the exponential decline in both airborne concentrations and the rate of deposition with distance*" in accordance with IAQM (2016) guidance.

26.6.1.1.2.1 DBS East or DBS West in Isolation

209. The potential dust emission magnitude for the Onshore Development Area for DBS East or DBS West in isolation has been determined using the criteria detailed in **Appendix 26.1**. The dust emission magnitudes have been determined from the worst case assumptions identified in **Table 26-2** and are detailed in **Table 26-31**.

Table 26-31 Defined Dust Emission Magnitudes Associated for Each Construction Activity for the Onshore Development Area

Construction Activity	Dust Emission Magnitude	Rationale
Human Receptors (Worst case)		
Earthworks (site area and earth works)	Large (>10,000m^2)	**Landfall:** The proposed construction compound at landfall is anticipated to be 230 x 75m (i.e. 17,250 m^2) and topsoil will be stripped within this area.
	Large (>10,000m^2)	**The north of Beverley (i.e. onshore export cable corridor and construction compounds):** The proposed construction compounds to the north of Beverley will have a combined footprint of up to 40,000m^2. Earthworks within the onshore export cable corridor will comprise removal and the storage of topsoil and subsoil separately at the side of the trench, followed by excavation of a trench approximately 2m deep. The trench would be excavated in sections along the onshore export cable corridor.
	Large (>10,000m^2)	**Onshore substation:** The maximum operational area at the onshore substation will have a footprint of approximately 135,000m^2, with a total substation construction compound of (180,000m^2) and soil will be stripped.

Construction Activity	Dust Emission Magnitude	Rationale
Construction (construction materials)	Medium	**All locations:** There are not anticipated to be any buildings constructed within the construction compounds (offices, etc. at the onshore substation would be prefabricated); however, it has been assumed that cement bound sand (CBS) would be used to line the cable trench and pack around the ducts, and this is a potentially dusty construction material.
Trackout (no. HGV outward movements per day)	Medium	**All locations:** There would be between 10 to 50 outward daily HGV movements*
Ecological Receptors (worst case)		
Earthworks (site area and earthworks)	Large (>10,000m^2)	**Burton Bushes SSSI and Ancient Woodland:** The proposed construction compound to the west is approximately 10,000m^2 and topsoil will be stripped. Excavations for trenching will occur within 200m of Burton Bushes SSSI and Ancient Woodland.
Construction (construction materials)	Medium	**Unnamed Woodland adjacent to Substation Zone 4:** It has been assumed that CBS would be used to line the cable trench and pack around the ducts, which is a potentially dusty construction material.
Trackout (no. HGV outward movements per day)	Medium	**Burton Bushes SSSI and Ancient Woodland:** It is assumed as a worst case that there would be between 10 and 50 outward daily HGV movements*
*HGV outward movements per day have been estimated from the HGV traffic flows presented in **Table 26-9** and Appendix 26.2, where the number of outward HGV movements per day is half the HGV (per day) flow. While some construction routes (up to 500m from the Onshore Development Area) have more than 50 HDV outward movements per day, very few human receptors (<10) and no ecological receptors are located on these routes, therefore assessing fewer HGV movements on routes with >10 human receptors results in the same dust emission magnitude overall.		

26.6.1.1.2.2 DBS East and DBS West Concurrent Construction

210. The potential dust emission magnitude for the Onshore Development Area under DBS East and DBS West concurrent construction has been determined using the criteria detailed in **Appendix 26.1**. The dust emission magnitudes have been determined from the worst case assumptions identified in **Table 26-2** and are detailed in **Table 26-32**.

Table 26-32 Defined Dust Emission Magnitudes Associated for Each Construction Activity for the Onshore Development Area - DBS East and DBS West Concurrent Construction

Construction Activity	Dust Emission Magnitude	Rationale
Human Receptors (Worst case)		
Earthworks (site area and earth works)	Large (>10,000m^2)	**Landfall:** The proposed construction compound at landfall is anticipated to be 310 x 75m (i.e., 23,250m^2) and topsoil will be stripped within this area.
	Large (>10,000m^2)	**The north of Beverley (i.e., onshore export cable corridor and construction compounds):** The proposed construction compounds to the north of Beverley will have a combined footprint of up to 40,000m^2. Earthworks within the onshore export cable corridor will comprise removal and the storage of topsoil and subsoil separately at the side of the trench, followed by excavation of a trench approximately 2m deep. The trench would be excavated in sections along the onshore export cable corridor.
	Large (>10,000m^2)	**Onshore substation:** The maximum operational area at the onshore substation will have a footprint of approximately 199,416m^2, with a total substation construction area of 274,416m^2 and soil will be stripped.

Construction Activity	Dust Emission Magnitude	Rationale
Construction (construction materials)	Medium	**All locations:** There are not anticipated to be any buildings constructed within the construction compounds (offices, etc. at the onshore substation would be prefabricated); however, it has been assumed that cement bound sand (CBS) would be used to line the cable trench and pack around the ducts, and this is a potentially dusty construction material.
Trackout (no. HGV outward movements per day)	Medium	**All locations:** There would be between 10 to 50 outward daily HGV movements*.
Ecological Receptors (worst case)		
Earthworks (site area and earthworks)	Large (>10,000m^2)	**Burton Bushes SSSI and Ancient Woodland:** The proposed construction compound to the west is approximately 10,000m^2) and topsoil will be stripped. Excavations for trenching will occur within 200m of Burton Bushes SSSI and Ancient Woodland.
Construction (construction materials)	Medium	**Burton Bushes SSSI and Ancient Woodland:** It has been assumed that CBS would be used to line the cable trench and pack around the ducts, which is a potentially dusty construction material.
Trackout (no. HGV outward movements per day)	Medium	**Burton Bushes SSSI and Ancient Woodland:** It is assumed as a worst case that there would be between 10 and 50 outward daily HGV movements*.
*HGV outward movements per day have been estimated from the HGV traffic flows presented in **Table 26-9** and **Appendix 26.2**, where the number of outward HGV movements per day is half the HGV (per day) flow. While some construction routes (up to 500m from the Onshore Development Area) have more than 50 HDV outward movements per day, very few human receptors (<10) and no ecological receptors are located on these routes, therefore assessing fewer HGV movements on routes with >10 human receptors results in the same dust emission magnitude overall.		

26.6.1.1.3 Step 2B: Define the Sensitivity of the Area

211. The sensitivity of receptors to dust soiling, impacts on human health and ecological effects has been determined using the criteria in **Appendix 26.1**. **Figure 26-2** details the distance bands from the Onshore Development Area used in determining the sensitivity of the area.

26.6.1.1.3.1 All Scenarios

212. The sensitivity of the area is defined as:

- Sensitivity of receptors to dust soiling on people and property:
  - Earthworks and construction: There are between 1 to 10 high sensitivity residential receptors located within 50m the indicative compound at landfall. There are between 10 to 100 high sensitivity residential receptors within 100m of the onshore export cable corridor and construction compounds to the north of Beverley, and there are between 1 and 10 high sensitivity residential receptors within 20m of the indicative onshore substation red line boundary at the onshore substation. The sensitivity is therefore medium at the onshore substation location, and low at the possible landfall location and to the north of Beverley.
  - Trackout: There are between 1 to 10 high sensitivity residential receptors within 20m of roads used by construction vehicles up to 500m from the site at the possible landfall location. There are between 10 and 100 high sensitivity residential receptors within 50m of roads used to the north of Beverley, and between 1 to 10 high sensitivity residential receptors within 20m of roads used to access the onshore substation zone. The sensitivity is therefore medium at all locations.

- Sensitivity of receptors to human health effects of PM_{10}:
  - The highest annual mean background PM_{10} concentration across the study area is less than 24µg.m^{-3}.
  - Earthworks and construction: There are between 1 to 10 high sensitivity residential receptors located within 50m the indicative compound at landfall. There are between 10 to 100 high sensitivity residential receptors within 100m of the onshore export cable corridor and construction compounds to the north of Beverley, and there are between 1 and 10 high sensitivity residential receptors within 20m of the indicative onshore substation red line boundary at the onshore substation. The sensitivity is therefore low for all assessed locations; and
  - Trackout: There are between 1 to 10 high sensitivity residential receptors within 20m of roads used by construction vehicles up to 500m from the site at the possible landfall location. There are between 10 and 100 high sensitivity residential receptors within 50m of roads used to the north of Beverley, and between 1 to 10 high sensitivity residential receptors within 20m of roads used to access the onshore substation zone. The sensitivity is therefore low at all locations.
- Sensitivity of receptors to ecological effects:
  - Earthworks and construction: Burton Bushes SSSI and Ancient Woodland have been conservatively assumed to be of high sensitivity (as the SSSI is a national designation and may be affected by dust soiling) and is within 20m of the indicative landfall HDD compound. The sensitivity is therefore high.
  - Trackout: Burton Bushes SSSI and Ancient Woodland has been conservatively assumed to be of high sensitivity (as it is a national designation and may be affected by dust soiling) and is within 20m of routes used by construction vehicles, up to 500m from the Onshore Development Area. The sensitivity is therefore high.

213. The sensitivity of receptors to dust soiling, human health impacts and ecological impacts (as an assessment of the worst case scenario location) for each activity is summarised in **Table 26-33**.

Table 26-33 Sensitivity of the Area to Each Activity Under all Scenarios

Potential Impact	Sensitivity Of The Surrounding Area		
	Earthworks	**Construction**	**Trackout**
Dust soiling	Medium – onshore substation Low – landfall and to the north of Beverley	Medium – onshore substation Low – landfall and to the north of Beverley	Medium
Human health	Low	Low	Low
Ecological	High	High	High

26.6.1.1.4 Step 2C: Define the Risk of Impacts

26.6.1.1.4.1 All Scenarios

214. The dust and PM_{10} emission magnitude and sensitivity of the area(s) are combined, and the risk of effects determined using **Appendix 26.1.** The risks for dust soiling, human health and ecological effects are shown in **Table 26-34**.

Table 26-34 Risk of Dust Impacts Under all Scenarios

Potential Impact	Dust Risk		
	Earthworks	**Construction**	**Trackout**
Dust soiling	Medium – onshore substation Low – landfall and to the north of Beverley	Medium – onshore substation Low – landfall and to the north of Beverley	Low
Human health	Low	Low	Low
Ecological	High	Medium	Medium

215. It is anticipated that the risk of dust effects would be the same under all scenarios as the dust emission magnitudes and the sensitivity of the area, defined in section 26.6.1.1.2 and 0 respectively, are the same for each assessed scenario..

26.6.1.1.5 Mitigation – Step 3: Site Specific Mitigation (Under all Scenarios)

216. Step 3 of the IAQM guidance (2016) identifies the appropriate good practice mitigation measures required based on the findings of Step 2 of the assessment methodology. Step 2 of the dust assessment determined that the greatest risk of effects was 'high risk' under the worst case scenario, without the implementation of mitigation measures. The aim of these mitigation measures is to achieve a residual impact that is not significant.

217. Recommended mitigation measures are listed in the IAQM guidance document according to the 'risk' of effects associated with the release of dust and PM_{10} from construction activities. Recommended mitigation measures include minimising the production and transmission of dust from construction activities, and the requirement to carry out regular visual on-site and off-site inspections of dust deposition levels, so that appropriate action can be taken in the event of any issues being identified.

218. Mitigation measures that are recommended for a high risk site, as determined by Step 2 of the dust assessment, are listed in the IAQM guidance (IAQM, 2017). These measures are be outlined within the Project's OCoCP.

26.6.1.1.6 Residual Impacts – Step 4: Determine Significant Effects (Under all Scenarios)

219. With the implementation of the above mitigation measures, which will be secured in the final CoCP, the residual impacts from either DBS East or DBS West in isolation or concurrent construction of DBS East and DBS West are considered to be not significant, in accordance with IAQM guidance (2016).

26.6.1.2 Impact 2 NRMM Emissions

220. DBS East and DBS West constructed concurrently may result in a higher magnitude of impacts due to more NRMM plant (including HDD rigs) running concurrently at landfall than a single Project being constructed at any one time (in isolation and sequential construction). Therefore, concurrent construction has been the focus of the NRMM emissions assessment, as it will require the highest number of NRMM plant operational at any one time.

221. As discussed in section 26.4.3.2, NRMM control measures will be implemented as embedded mitigation and therefore a qualitative assessment of DBS East and DBS West-generated NRMM used during construction at landfall, the onshore substation zone and along the onshore export cable corridor has been undertaken where effects on receptors may occur (see **Table 26-1**).This qualitative assessment takes into account:

- The number and type of plant to be used;
- The working hours to be employed and the duration of works;
- Existing air quality conditions in the area (based on Defra background pollutant concentration maps);
- Prevailing meteorological conditions (see **Plate 26-1**); and
- Distances from NRMM to the nearest receptors.

222. The greatest anticipated number of plant working at one location at the same time is anticipated to be for the onshore substation construction works. Elsewhere within the Onshore Development Area the construction works would be less intensive.

223. The anticipated working hours for construction of the Projects 7am-7pm Monday to Friday and 7am-1pm Saturday (i.e., 66 hours per week), subject to any essential activities that are required to be undertaken outside of these times.

224. The Onshore Development Area is largely rural in nature and, as shown in **Table 26-29**, the future 2026 background concentrations of NO_2, PM_{10} and $PM_{2.5}$ at landfall, along the onshore export cable corridor and at the onshore substation zone are 'well below' (i.e. less than 75% of) and no greater than 50% of their respective annual mean Objectives and are expected to continue to decrease into the future.

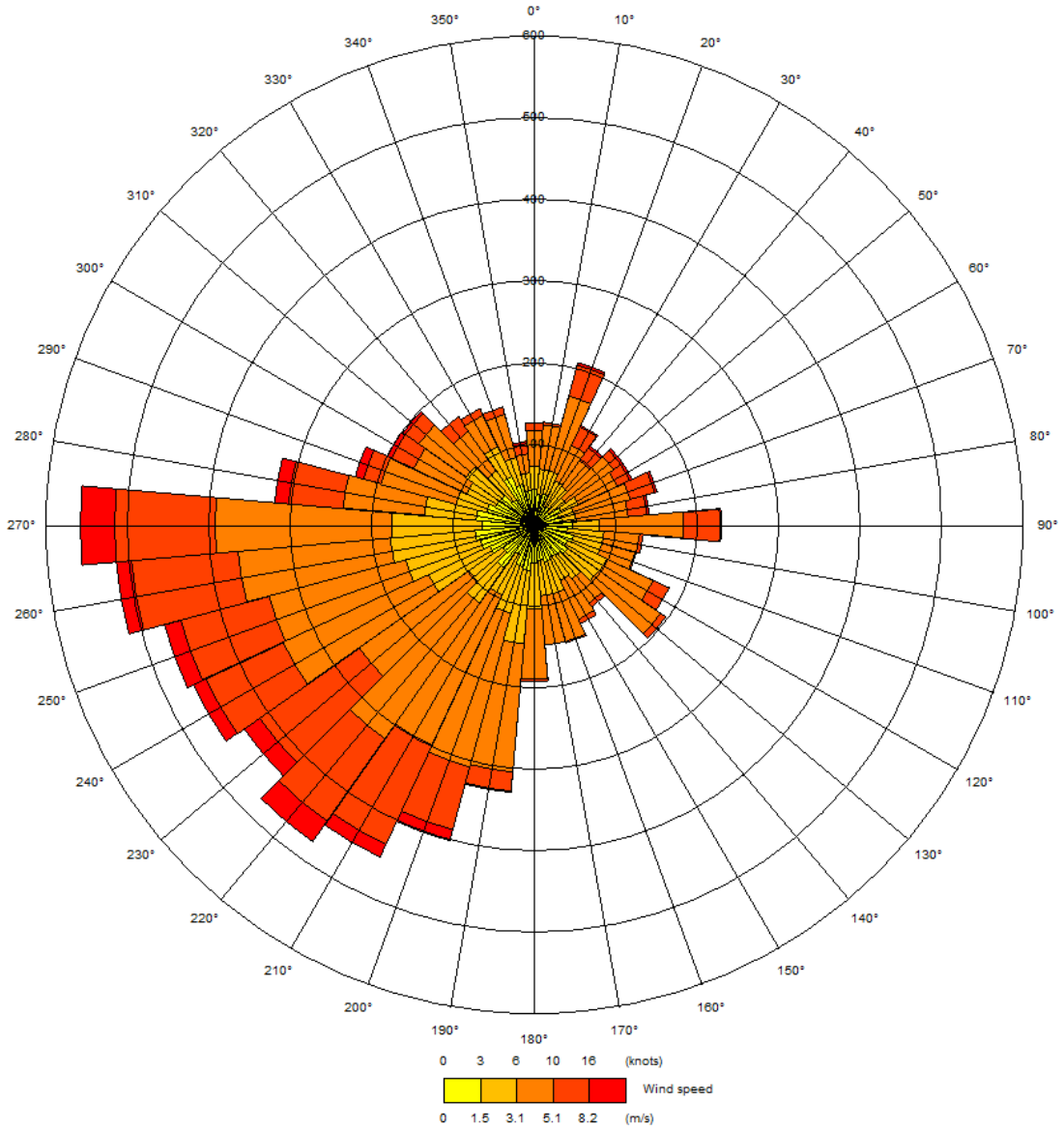

Plate 26-1 Leconfield Meteorological Station Wind Rose (2019)

225. The potential impacts associated with NRMM used at the indicative landfall HDD compound, the onshore export cable corridor and the onshore substation zone are set out below.

26.6.1.2.1 NRMM at Landfall

226. The closest downwind human receptors are the residential properties off Green Lane to the north, approximately 50m north of the indicative HDD compound.

227. HDD works may, by necessity, be required to operate 24/7 rather than only during the Project's working hours (7am-7pm Monday to Friday, and 7am-1pm on Saturday). However, the duration of HDD works at landfall is expected to be approximately six to eight months, and therefore emissions would not occur over a full year.

228. As shown in the wind rose in **Plate 26-1**, the prevailing winds at Leconfield are consistently from the west and south-west. Therefore, emissions from the HDD would be dispersed away from the residential receptors to the north during westerly wind conditions. As such, in consideration of annual mean pollutant concentrations, the impact would be reduced.

229. Given the above, and the low background pollutant concentrations in the area, it is therefore considered highly unlikely that the health-based air quality Objectives would be exceeded with the employment of control and management measures (as detailed in **Table 26-3**).

230. As detailed in section 26.5.3.1.2, none of the ecological receptors in proximity to landfall are sensitive to air pollution.

231. NRMM emissions associated with the construction compound and transition joint bays would be more intermittent in nature, and would only occur during working hours. Once construction of the landfall elements has been completed (including demobilisation) no pollution sources would be present (i.e. there are no operational phase impacts on local air quality) as a result of the Projects. As the works at landfall would be short-term and temporary, and with the employment of relevant control and management measures detailed in **Table 26-3**, it is unlikely significant impacts would occur as a result of emissions from NRMM.

232. The effect of emissions from NRMM used at the landfall is therefore considered to be not significant.

26.6.1.2.2 NRMM along the Onshore Export Cable Corridor

233. The primary activities that would occur along the onshore export cable corridor are temporary haul road construction, cable laying and removal/excavation/backfilling works associated with the trench.

234. As construction works on the onshore export cable would be undertaken in sections in a linear nature, NRMM plant would only be operational in the vicinity of a receptor for only a relatively short duration, and not for the full duration of the onshore export cable corridor construction programme (33 months).

235. As noted in **Table 26-29**, background pollutant concentrations are less than 50% of the relevant air quality Objectives. Therefore, it is unlikely that NRMM along the onshore export cable corridor would have a significant impact on local air quality with control and management measures employed (as detailed in **Table 26-3**).

236. With regard to ecological receptors, there is only one receptor, Burton Bushes SSSI and Ancient Woodland, in the vicinity of the onshore export cable corridor. The intermittent and short-term nature of the plant usage during the construction of the onshore export cable corridor would also reduce the potential for significant impacts at this location. It is therefore expected that with the employment of management and control measures, particularly siting plant and other emission sources as far from the woodland as is practicable (see **Table 26-3**), will mean that effects would be not significant.

26.6.1.2.3 NRMM at the Onshore Substation

237. The onshore substation zones for DBS East and DBS West are located in arable land south-west of Beverley. Construction activities in the onshore substation zones include site preparation and earthworks, and construction of the onshore substations and permanent access routes.

238. The nearest human receptors to the onshore substation zones are residential receptors located in Bentley to the south (Substation Zone 4). The nearest ecological receptor is an unnamed Ancient Woodland, located within the boundary of Substation Zone 4.

239. The duration of construction works at the onshore substation zones during concurrent build of DBS East and DBS West would occur for up to four years. However, emissions would only occur during working hours, and plant usage would be intermittent and variable throughout the working day rather than used continually. In addition, given that the prevailing wind direction (see **Plate 26-1**) is from the west and south-west, NRMM emissions would be dispersed away from any nearby human receptors for the majority of the time.

240. Given the low background pollutant concentrations in the area, and the fact that the source of NRMM emissions would be temporary during construction only, it is unlikely NRMM at the onshore substations would have a significant impact on local air quality with the employment of control and management measures (as detailed in **Table 26-3**).

26.6.1.2.4 NRMM Significance

241. Defra technical guidance (Defra, 2022b) states that emissions from NRMM used on construction sites are unlikely to have a significant impact on local air quality where relevant control and management measures are employed, and a qualitative assessment of effects is sufficient for consideration of effects. The results of the qualitative assessment above demonstrates that intensive construction activities are unlikely to have a significant impact on local air quality with the implementation of the mitigation measures detailed in **Table 26-3.**

26.6.1.2.5 Mitigation Measures Specific to NRMM (Under all Scenarios)

242. Effects were found to not be significant, taking into account the employment of embedded mitigation measures detailed in **Table 26-3**. As such, no further mitigation measures are required.

26.6.1.3 Impact 3 Construction Road Vehicle Exhaust Emissions

243. As detailed in Section 26.3.2.3, the Projects' construction-generated road traffic flows have been determined for the worst case scenario which is DBS East and DBS West concurrently (see **Chapter 24 Traffic and Transport**). Construction generated traffic impacts for the scenario where DBS East or DBS West are built in isolation have also been considered.

26.6.1.3.1 DBS East or DBS West in Isolation

26.6.1.3.1.1 Human Receptors

244. The 24-hour AADT flows and HGV percentages used in the air quality assessment for DBS East or DBS West in isolation are detailed in **Appendix 26.2**.

245. Predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations for the earliest year of construction (2026) 'with DBS East or DBS West' in isolation scenario are detailed in **Table 26-35** to **Table 26-38**. Concentrations for the 'without DBS East and DBS West' assessment are also shown for comparison purposes. All concentrations are inclusive of the background concentration at each receptor.

246. The predicted annual mean concentration at each specified receptor has been compared to the monitored concentration at the most representative monitoring site, where available (**Table 26-39**) as required by the Hull City Council EHO (stated in the consultation responses in **Table 26-1**). It should be noted that the majority of monitoring sites operated by Hull City Council are Kerbside sites (located within 1m of the road) which experience elevated levels of road emissions compared to relevant exposure (as captured within the assessment). Monitored concentrations are therefore expected to be elevated compared to that experienced by the majority of residential exposure within the study area.

Table 26-35 Annual Mean NO_2 Results at Sensitive Human Receptor Locations for DBS East or DBS West in Isolation

Receptor ID	**DBS East or DBS West in Isolation**				
	2026 Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	**With DBS East or DBS West**	**Change**	**Change as % of the Objective**	**Impact Descriptor**
Hull City Council					
R1	26.7	27.0	0.3	1%	Negligible
R2	22.9	23.1	0.2	0%	Negligible
R30	18.9	19.0	0.1	0%	Negligible
R31	16.7	16.9	0.2	1%	Negligible

Receptor ID	DBS East or DBS West in Isolation				
	2026 Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$) Objective = $40\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East or DBS West	Change	Change as % of the Objective	Impact Descriptor
R32	17.3	17.6	0.4	1%	Negligible
R33	22.3	22.5	0.2	0%	Negligible
R34	17.5	17.7	0.2	0%	Negligible
R35	16.8	17.0	0.1	0%	Negligible
R36	21.4	21.7	0.4	1%	Negligible
R37	18.5	18.8	0.3	1%	Negligible
R38	20.0	20.5	0.5	1%	Negligible
R39	24.1	24.9	0.9	2%	Negligible
R40	20.6	20.7	0.1	0%	Negligible
R41	15.2	15.6	0.4	1%	Negligible
R42	13.1	13.3	0.1	0%	Negligible
R43	16.6	16.7	0.1	0%	Negligible
R44	14.6	14.7	0.1	0%	Negligible
East Riding of Yorkshire					
R3	20.5	20.6	0.1	0%	Negligible
R4	20.6	20.8	0.3	1%	Negligible
R5	16.7	16.8	0.1	0%	Negligible
R6	21.5	21.6	0.2	0%	Negligible

Receptor ID	DBS East or DBS West in Isolation				
	2026 Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East or DBS West	Change	Change as % of the Objective	Impact Descriptor
R7	11.7	12.0	0.3	1%	Negligible
R8	10.7	10.9	0.2	1%	Negligible
R9	12.5	12.8	0.3	1%	Negligible
R10	12.0	12.2	0.2	0%	Negligible
R11	13.5	13.8	0.3	1%	Negligible
R12	14.7	15.3	0.6	2%	Negligible
R13	8.3	8.4	0.0	0%	Negligible
R14	9.5	9.6	0.1	0%	Negligible
R15	11.0	11.3	0.3	1%	Negligible
R16	14.9	15.7	0.9	2%	Negligible
R17	10.0	10.0	0.0	0%	Negligible
R18	13.6	13.9	0.4	1%	Negligible
R19	12.5	12.9	0.4	1%	Negligible
R20	14.9	15.3	0.4	1%	Negligible
R21	9.9	10.0	0.2	0%	Negligible
R22	8.5	8.7	0.2	0%	Negligible
R23	10.6	10.9	0.3	1%	Negligible
R24	10.8	10.9	0.1	0%	Negligible

Receptor ID	DBS East or DBS West in Isolation				
	2026 Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East or DBS West	Change	Change as % of the Objective	Impact Descriptor
R25	11.6	11.9	0.2	1%	Negligible
R26	12.1	12.2	0.1	0%	Negligible
R27	9.6	9.7	0.1	0%	Negligible
R28	8.9	8.9	0.0	0%	Negligible
R29	9.1	9.2	0.0	0%	Negligible
R45	11.7	11.8	0.1	0%	Negligible
R46	11.6	11.9	0.3	1%	Negligible
R47	9.3	9.4	0.1	0%	Negligible

Table 26-36 Annual Mean PM_{10} Results at Sensitive Human Receptor Locations for DBS East or DBS West in Isolation

Receptor ID	DBS East or DBS West in Isolation				
	2026 Annual Mean PM_{10} Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East or DBS West	Change	Change as % of the Objective	Impact Descriptor
Hull City Council					
R1	20.1	20.3	0.2	1%	Negligible
R2	17.7	17.9	0.1	0%	Negligible
R30	15.6	15.7	0.1	0%	Negligible
R31	15.2	15.4	0.1	0%	Negligible
R32	15.4	15.5	0.2	0%	Negligible
R33	14.6	14.8	0.1	0%	Negligible
R34	16.4	16.5	0.1	0%	Negligible
R35	16.1	16.2	0.0	0%	Negligible
R36	17.0	17.2	0.2	0%	Negligible
R37	15.8	15.9	0.1	0%	Negligible
R38	16.2	16.3	0.1	0%	Negligible
R39	17.3	17.5	0.2	1%	Negligible
R40	15.8	15.8	0.0	0%	Negligible
R41	15.8	16.0	0.1	0%	Negligible
R42	15.3	15.4	0.1	0%	Negligible
R43	15.8	15.8	0.1	0%	Negligible

Receptor ID	DBS East or DBS West in Isolation				
	2026 Annual Mean PM_{10} Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East or DBS West	Change	Change as % of the Objective	Impact Descriptor
R44	14.4	14.5	0.1	0%	Negligible
East Riding of Yorkshire					
R3	17.5	17.6	0.1	0%	Negligible
R4	17.5	17.6	0.2	0%	Negligible
R5	16.0	16.1	0.1	0%	Negligible
R6	19.3	19.4	0.2	0%	Negligible
R7	15.8	15.9	0.1	0%	Negligible
R8	15.8	16.0	0.2	0%	Negligible
R9	15.2	15.4	0.2	1%	Negligible
R10	15.6	15.7	0.1	0%	Negligible
R11	16.9	17.1	0.2	1%	Negligible
R12	16.7	17.0	0.4	1%	Negligible
R13	14.1	14.2	0.1	0%	Negligible
R14	14.4	14.5	0.1	0%	Negligible
R15	14.0	14.1	0.1	0%	Negligible
R16	14.8	15.1	0.2	1%	Negligible
R17	13.1	13.1	0.0	0%	Negligible
R18	16.5	16.8	0.3	1%	Negligible

Receptor ID	DBS East or DBS West in Isolation				
	2026 Annual Mean PM_{10} Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East or DBS West	Change	Change as % of the Objective	Impact Descriptor
R19	16.2	16.5	0.3	1%	Negligible
R20	17.6	17.9	0.3	1%	Negligible
R21	14.2	14.2	0.0	0%	Negligible
R22	14.5	14.6	0.0	0%	Negligible
R23	14.9	14.9	0.1	0%	Negligible
R24	15.5	15.6	0.1	0%	Negligible
R25	15.8	15.9	0.1	0%	Negligible
R26	16.3	16.3	0.1	0%	Negligible
R27	15.4	15.5	0.0	0%	Negligible
R28	15.5	15.5	0.0	0%	Negligible
R29	15.6	15.7	0.0	0%	Negligible
R45	14.7	14.8	0.1	0%	Negligible
R46	15.7	15.8	0.2	0%	Negligible
R47	14.9	14.9	0.0	0%	Negligible

Table 26-37 Short Term Mean PM_{10} Results at Sensitive Human Receptor Locations for DBS East or DBS West in Isolation

Receptor ID	DBS East or DBS West in Isolation		
	2026 Number of Days >50µg.m^{-3} (Objective being less than 35 exceedances per year)		
	Without DBS East or DBS West	With DBS East or DBS West	Change
Hull City Council			
R1	4	4	0
R2	1	1	0
R30	0	0	0
R31	0	0	0
R32	0	0	0
R33	0	0	0
R34	0	1	0
R35	0	0	0
R36	1	1	0
R37	0	0	0
R38	0	0	0
R39	1	1	0
R40	0	0	0
R41	0	0	0
R42	0	0	0
R43	0	0	0
R44	0	0	0

Receptor ID	DBS East or DBS West in Isolation		
	2026 Number of Days >50µg.m^{-3} (Objective being less than 35 exceedances per year)		
	Without DBS East or DBS West	With DBS East or DBS West	Change
East Riding of Yorkshire			
R3	1	1	0
R4	1	1	0
R5	0	0	0
R6	3	3	0
R7	0	0	0
R8	0	0	0
R9	0	0	0
R10	0	0	0
R11	1	1	0
R12	1	1	0
R13	0	0	0
R14	0	0	0
R15	0	0	0
R16	0	0	0
R17	0	0	0
R18	0	1	0
R19	0	0	0
R20	1	1	0

Receptor ID	DBS East or DBS West in Isolation		
	2026 Number of Days >50µg.m^{-3} (Objective being less than 35 exceedances per year)		
	Without DBS East or DBS West	With DBS East or DBS West	Change
R21	0	0	0
R22	0	0	0
R23	0	0	0
R24	0	0	0
R25	0	0	0
R26	0	0	0
R27	0	0	0
R28	0	0	0
R29	0	0	0
R45	0	0	0
R46	0	0	0
R47	0	0	0
Values have been rounded to the nearest whole number therefore the change observed between without and with DBS East or DBS West does not always equate to an overall change of the same magnitude.			

Table 26-38 Annual Mean $PM_{2.5}$ Results at Sensitive Human Receptor Locations for DBS East or DBS West in Isolation

Receptor ID	DBS East or DBS West in Isolation				
	2026 Annual Mean $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) Objective = 20$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East or DBS West	Change	Change as % of the Objective	Impact Descriptor
Hull City Council					
R1	12.1	12.2	0.11	1%	Negligible
R2	10.8	10.9	0.06	0%	Negligible
R30	9.7	9.7	0.03	0%	Negligible
R31	9.3	9.4	0.07	0%	Negligible
R32	9.4	9.5	0.09	0%	Negligible
R33	9.1	9.2	0.08	0%	Negligible
R34	10.5	10.5	0.04	0%	Negligible
R35	10.3	10.3	0.03	0%	Negligible
R36	11.0	11.1	0.11	1%	Negligible
R37	10.0	10.1	0.06	0%	Negligible
R38	10.2	10.3	0.08	0%	Negligible
R39	10.9	11.0	0.13	1%	Negligible
R40	10.0	10.0	0.02	0%	Negligible
R41	9.6	9.6	0.08	0%	Negligible
R42	9.2	9.3	0.05	0%	Negligible
R43	10.3	10.4	0.04	0%	Negligible

Receptor ID	DBS East or DBS West in Isolation				
	2026 Annual Mean $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) Objective = 20$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East or DBS West	Change	Change as % of the Objective	Impact Descriptor
R44	9.3	9.3	0.04	0%	Negligible
East Riding of Yorkshire					
R3	10.3	10.3	0.06	0%	Negligible
R4	10.3	10.4	0.09	0%	Negligible
R5	9.5	9.5	0.04	0%	Negligible
R6	10.9	11.0	0.10	1%	Negligible
R7	8.6	8.6	0.07	0%	Negligible
R8	8.5	8.6	0.09	0%	Negligible
R9	8.5	8.7	0.12	1%	Negligible
R10	8.5	8.6	0.06	0%	Negligible
R11	9.1	9.2	0.12	1%	Negligible
R12	9.2	9.4	0.19	1%	Negligible
R13	7.8	7.8	0.03	0%	Negligible
R14	8.0	8.0	0.03	0%	Negligible
R15	8.4	8.4	0.07	0%	Negligible
R16	8.8	9.0	0.13	1%	Negligible
R17	7.8	7.8	0.02	0%	Negligible
R18	9.0	9.1	0.15	1%	Negligible

Receptor ID	DBS East or DBS West in Isolation				
	2026 Annual Mean $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) Objective = 20$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East or DBS West	Change	Change as % of the Objective	Impact Descriptor
R19	8.8	8.9	0.15	1%	Negligible
R20	9.3	9.5	0.15	1%	Negligible
R21	7.7	7.7	0.02	0%	Negligible
R22	7.5	7.6	0.02	0%	Negligible
R23	7.8	7.8	0.04	0%	Negligible
R24	8.4	8.5	0.06	0%	Negligible
R25	8.5	8.6	0.07	0%	Negligible
R26	8.6	8.7	0.07	0%	Negligible
R27	8.2	8.2	0.06	0%	Negligible
R28	8.1	8.1	0.02	0%	Negligible
R29	8.2	8.2	0.02	0%	Negligible
R45	8.7	8.7	0.03	0%	Negligible
R46	8.5	8.6	0.08	0%	Negligible
R47	7.9	7.9	0.02	0%	Negligible

Table 26-39 Comparison of Annual Mean NO_2 Results at Sensitive Human Receptor Locations in Hull City Council for DBS East or DBS West in Isolation Against Monitored Concentrations at Sites Operated by Hull City Council

DBS East or DBS West in Isolation						
Comparison of 2026 Annual Mean NO_2 Concentrations against 2019 monitored concentrations within Hull City Council ($\mu g.m^{-3}$)						
Receptor ID	**Without DBS East or DBS West ($\mu g.m^{-3}$)**	**With DBS East or DBS West ($\mu g.m^{-3}$)**	**Nearest representative Monitoring Site ID Operated By Hull City Council**	**2019 Monitored Concentration ($\mu g.m^{-3}$)**	**Change ($\mu g.m^{-3}$)**	**Impact Descriptor**
R1	26.7	27.0	S13	31.9	-4.94	Negligible
R2	22.9	23.1	S13	31.9	-8.84	Negligible
R30	18.9	19.0	S30	23.9	-4.92	Negligible
R31	16.7	16.9	S44	30.9	-13.98	Negligible
R32	17.3	17.6	S44	30.9	-13.28	Negligible
R33	22.3	22.5	S44	30.9	-8.45	Negligible
R34	17.5	17.7	-	-	-	Negligible

DBS East or DBS West in Isolation						
Comparison of 2026 Annual Mean NO_2 Concentrations against 2019 monitored concentrations within Hull City Council ($\mu g.m^{-3}$)						
Receptor ID	**Without DBS East or DBS West ($\mu g.m^{-3}$)**	**With DBS East or DBS West ($\mu g.m^{-3}$)**	**Nearest representative Monitoring Site ID Operated By Hull City Council**	**2019 Monitored Concentration ($\mu g.m^{-3}$)**	**Change ($\mu g.m^{-3}$)**	**Impact Descriptor**
R35	16.8	17.0	-	-	-	Negligible
R36	21.4	21.7	-	-	-	Negligible
R37	18.5	18.8	S48	38.2	-19.39	Negligible
R38	20.0	20.5	S48	38.2	-17.71	Negligible
R39	24.1	24.9	-	-	-1.39	Negligible
R40	20.6	20.7	-	-	-	Negligible
R41	15.2	15.6	-	-	-	Negligible
R42	13.1	13.3	-	-	-	Negligible

DBS East or DBS West in Isolation						
Comparison of 2026 Annual Mean NO_2 Concentrations against 2019 monitored concentrations within Hull City Council ($\mu g.m^{-3}$)						
Receptor ID	**Without DBS East or DBS West ($\mu g.m^{-3}$)**	**With DBS East or DBS West ($\mu g.m^{-3}$)**	**Nearest representative Monitoring Site ID Operated By Hull City Council**	**2019 Monitored Concentration ($\mu g.m^{-3}$)**	**Change ($\mu g.m^{-3}$)**	**Impact Descriptor**
R43	16.6	16.7	CM3	30.6	-13.9	Negligible
R44	14.6	14.7	CM3	30.6	-15.93	Negligible

247. The results of the construction phase road traffic emissions assessment show that annual mean concentrations of NO_2 (see **Table 26-35**), PM_{10} (see

249. Table 26-36 and $PM_{2.5}$ (see **Table 26-38**) are predicted to be well below (i.e. less than 75% of) the respective air quality Objectives in the peak construction (2026) DBS East or DBS West in isolation at all receptors, both 'with' and 'without' DBS East or DBS West in place.

250. The changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations are 2% or less at all receptors; this corresponded to a 'negligible' impact, in accordance with IAQM and EPUK guidance (IAQM & EPUK, 2017). **Table 26-39** shows the predicted 2026 NO_2 concentrations at specified residential receptors within Hull City Council under DBS East or DBS West in isolation compared to the monitored concentrations undertaken in 2019 by Hull City Council, as requested by the EHO in Hull City Council ((pers. Comm., 9 January 2023).

251. As detailed in **Table 26-39**, the predicted annual mean concentration at all modelled receptors under DBS East or DBS West in isolation are lower than the comparative concentrations recorded in 2019 within Hull City Council. The impact of the DBS East or DBS West is therefore considered negligible in accordance with the Hull City Council supplementary planning guidance 'Air Quality Guidance for Planners and Developers' (Hull City Council, 2018).

252. All predicted NO_2 concentrations are well below 60µg.m^{-3} and therefore, in accordance with Defra guidance (Defra, 2021a), the 1-hour mean Objective is unlikely to be exceeded (see **Table 26-5**). Based on the calculation provided by Defra, as detailed in section 26.4.3.3, the short-term PM_{10} Objective was predicted to be met at all modelled locations (the Objective being less than 35 exceedances of 50 µg.m^{-3} as a daily mean). As shown in **Table 26-37**, there was no change in the number of days exceeding the daily mean Objective between the 'without' and 'with' DBS East or DBS West in isolation assessments, using the Defra (2022) calculation.

253. The assessment therefore concludes that impacts generated by DBS East or DBS West construction-generated road traffic upon local air quality are not significant.

26.6.1.3.1.2 Ecological Receptors

254. Table 26-40 presents the contribution of DBS East or DBS West in isolation and Table 26-41 presents the in-combination contribution (i.e. Project traffic, 2019 to 2026 traffic growth) (see section 26.4.3.3.7. Values in exceedance of 1% of the Critical Load or Level, i.e., those which cannot be considered to be insignificant, are shown in bold text.

Table 26-40 DBS East or DBS West in Isolation – Maximum Contribution of Project-generated NOx, NH_3, N-dep and Acid Deposition from Traffic on Feature(s) Under Designated Ecological Sites

Figures highlighted in bold are those which cannot be considered insignificant

Link	Designated Ecological Site			'DBS East or DBS West in Isolation' Project-Alone Contribution										
				Concentration or Flux				% of Critical Level or Critical Load						
	Site Type	Name	Feature Name or Critical Load Class	NOx	NH_3	N-Dep	Acid-Dep	NOx	NH_3		N-Dep		Acid-Dep	
				$\mu g.m^{-3}$	$\mu g.m^{-3}$	$kgN.ha^{-1}.yr^{-1}$	$keq.ha^{-1}.yr^{-1}$	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
26	SAC / SSSI	Humber Estuary	Pioneer, low-mid, mid-upper saltmarshes	0.734	0.017	0.153	NS	**2.4%**	**1.7%**	0.6%	0.8%	0.5%	-	-
26	SAC	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide	0.734	0.017	NC	NS	**2.4%**	**1.7%**	0.6%	-	-	-	-
26	SPA/SSSI	Humber Estuary	Pioneer, low-mid, mid-upper saltmarshes	0.734	0.017	0.153	NS	**2.4%**	0.6%	0.6%	0.8%	0.5%	-	-
26	LNR	Humber Bridge	Broadleaved deciduous woodland (MAGIC)	0.967	0.021	-*	N/A-*	**3.2%**	0.7%	0.7%	-	-	-	-
28	LNR	Humber Bridge	Broadleaved deciduous woodland (MAGIC)	0.119	0.004	-*	-*	0.4%	0.1%	0.1%	-	-	-	-
29	SAC	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide	0.451	0.010	NC	NS	**1.5%**	1.0%	0.3%	-	-	-	-
29	LNR	Humber Bridge	Broadleaved deciduous woodland (predominantly, based on priority mapping on MAGIC)	0.110	-	-*	-*	0.4%	-	-	-	-	-	-
63	AW	Unnamed woodland (ID1)	Coniferous woodland	-	0.004	0.086	0.006	-	0.4%	0.1%	**1.7%**	0.6%	0.1%	0.1%

AW = Ancient Woodland; NC= No comparable habitat with established critical load estimate available; NS = Not Sensitive

* Critical Loads were not assessed at LNRs as details of the specific habitats were not available

Table 26-41 DBS East or DBS West in Isolation – Maximum Contribution of In-combination NOx, NH_3, N-dep and Acid Deposition from Traffic on Feature(s) under Designation Ecological Sites

Figures highlighted in bold are those which cannot be considered insignificant

Link	Designated Ecological Site			'DBS East or DBS West in Isolation' In-combination Contribution										
				Concentration or Flux				% of Critical Level or Critical Load						
	Site Type	Name	Nitrogen CL Class	NOx	NH_3	N-Dep	Acid-Dep	NOx	NH_3		N-Dep		Acid-Dep	
				µg.m^{-3}	µg.m^{-3}	kgN.ha^{-1}.yr^{-1}	keq.ha^{-1}.yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
26	SAC / SSSI	Humber Estuary	Pioneer, low-mid, mid-upper saltmarshes	7.273	0.165	1.521	NS	**24.2%**	**16.5%**	**5.5%**	**7.6%**	**5.1%**	-	-
26	SAC	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide	7.273	0.165	NC	NS	**24.2%**	**16.5%**	**5.5%**	-	-	-	-
26	SPA/SSSI	Humber Estuary	Pioneer, low-mid, mid-upper saltmarshes	7.273	0.165	1.521	NS	**24.2%**	**5.5%**	**5.5%**	**7.6%**	**5.1%**	-	-
26	LNR	Humber Bridge	Broadleaved deciduous woodland (predominantly, based on priority mapping on MAGIC)	9.588	0.212	-*	-*	**32.0%**	**7.1%**	**7.1%**	-	-	-	-
28	LNR	Humber Bridge	Broadleaved deciduous woodland (predominantly, based on priority mapping on MAGIC)	0.495	0.018	-*	-*	**1.7%**	0.6%	0.6%	-	-	-	-
29	SAC	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide	4.378	0.095	NC	NS	**14.6%**	**9.5%**	**3.2%**	-	-	-	-
29	LNR	Humber Bridge	Broadleaved deciduous woodland (predominantly, based on priority mapping on MAGIC)	1.070	-	-*	-*	**3.6%**	-	-	-	-	-	-
63	AW	Unnamed woodland (ID1)	Coniferous woodland	-	0.011	0.242	0.017	-	**1.1%**	0.4%	**4.8%**	**1.6%**	0.2%	0.2%

AW = Ancient Woodland; NC= No comparable habitat with established critical load estimate available;; NS = Not Sensitive

* Critical Loads were not assessed at LNRs as details of the specific habitats were not available

255. As shown in **Table 26-41**, there are several sites which are predicted to experience in-combination impacts significantly in excess of 1% of the Critical Load or Level. However, comparison with **Table 26-40,** shows that only a small percentage of impacts at all sites is due to the contribution from DBS East or DBS West in isolation. Furthermore, as previously discussed, the impact of DBS East or DBS West in isolation is temporary and would be experienced only during construction. The impact of other in-combination plans and projects, for example traffic generated as a result of residential and employment developments associated with regional Local Plan allocations, would be experienced over a significantly longer duration. However, all sites where the NOx, NH_3, N-dep and/or Acid deposition are predicted to be above 1% of the relevant Critical Level or Load, cannot be considered to be insignificant. As such, the significance of impacts is discussed in **Chapter 9 Benthic Habitats** and **Chapter 18 Terrestrial Ecology and Ornithology**.

26.6.1.3.2 DBS East and DBS West Concurrent Construction

26.6.1.3.2.1 Human Receptors

256. The 24-hour AADT flows and HGV percentages used in the air quality assessment for DBS East and DBS West concurrent construction are detailed in **Appendix 26.2.**

257. Predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations for the 2026 year of peak construction (2026) 'with DBS East and DBS West concurrent construction' scenario are detailed in **Table 26-42** to **Table 26-45.**

258. The predicted annual mean concentration at each specified receptor has been compared to the monitored concentration at the most representative monitoring site, where available (**Table 26-46**) as required by the Hull City Council EHO (stated in the consultant responses **in Table 26-1**). As detailed in **Table 26-46**, the predicted annual mean concentration at all modelled receptors under DBS East and DBS West concurrent construction are lower than the comparative concentrations recorded in 2019 within Hull City Council. The impact of the DBS East and DBS West is therefore considered negligible in accordance with the Hull City Council supplementary planning guidance 'Air Quality Guidance for Planners and Developers' (Hull City Council, 2018).

Table 26-42 Annual Mean NO_2 Results at Sensitive Human Receptor Locations for DBS East and DBS West Concurrent Construction

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
Hull City Council					
R1	26.7	27.6	0.9	2%	Negligible
R2	22.9	23.4	0.6	1%	Negligible
R30	18.9	19.2	0.3	1%	Negligible
R31	16.7	17.1	0.4	1%	Negligible
R32	17.3	17.9	0.6	1%	Negligible
R33	22.3	22.6	0.3	1%	Negligible
R34	17.5	17.8	0.4	1%	Negligible
R35	16.8	17.1	0.3	1%	Negligible
R36	21.4	22.0	0.6	1%	Negligible
R37	18.5	19.0	0.5	1%	Negligible
R38	20.0	20.7	0.7	2%	Negligible
R39	24.1	25.3	1.3	3%	Negligible
R40	20.6	21.2	0.5	1%	Negligible
R41	15.2	15.8	0.6	2%	Negligible
R42	13.1	13.3	0.2	0%	Negligible
R43	16.6	16.8	0.2	1%	Negligible

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
R44	14.6	14.8	0.2	1%	Negligible
East Riding of Yorkshire					
R3	20.5	20.7	0.2	0%	Negligible
R4	20.6	21.0	0.4	1%	Negligible
R5	16.7	17.0	0.3	1%	Negligible
R6	21.5	21.7	0.3	1%	Negligible
R7	11.7	12.2	0.5	1%	Negligible
R8	10.7	11.0	0.3	1%	Negligible
R9	12.5	13.0	0.5	1%	Negligible
R10	12.0	12.4	0.4	1%	Negligible
R11	13.5	13.8	0.4	1%	Negligible
R12	14.7	15.8	1.1	3%	Negligible
R13	8.3	8.5	0.2	0%	Negligible
R14	9.5	9.9	0.4	1%	Negligible
R15	11.0	11.5	0.5	1%	Negligible
R16	14.9	16.5	1.7	4%	Negligible
R17	10.0	10.3	0.4	1%	Negligible
R18	13.6	14.2	0.6	2%	Negligible

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
R19	12.5	13.3	0.8	2%	Negligible
R20	14.9	15.6	0.7	2%	Negligible
R21	9.9	10.1	0.3	1%	Negligible
R22	8.5	8.8	0.3	1%	Negligible
R23	10.6	11.2	0.5	1%	Negligible
R24	10.8	10.9	0.1	0%	Negligible
R25	11.6	11.9	0.3	1%	Negligible
R26	12.1	12.4	0.3	1%	Negligible
R27	9.6	9.8	0.2	0%	Negligible
R28	8.9	9.0	0.1	0%	Negligible
R29	9.1	9.2	0.1	0%	Negligible
R45	11.7	11.9	0.3	1%	Negligible
R46	11.6	12.1	0.5	1%	Negligible
R47	9.3	9.5	0.2	0%	Negligible
R48	13.0	13.7	0.7	2%	Negligible
R49	5.7	5.8	0.1	0%	Negligible
R50	8.7	8.8	0.1	0%	Negligible
R51	5.5	5.5	0.0	0%	Negligible

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
R52	6.4	6.5	0.1	0%	Negligible
R53	9.3	9.5	0.1	0%	Negligible
R54	8.9	9.1	0.2	1%	Negligible
R55	11.3	12.0	0.7	2%	Negligible
R56	8.2	8.3	0.1	0%	Negligible
R57	8.2	8.2	0.0	0%	Negligible
R58	9.4	9.6	0.2	1%	Negligible
R59	7.7	7.8	0.0	0%	Negligible
R60	5.9	5.9	0.0	0%	Negligible
R61	5.7	5.8	0.1	0%	Negligible
R62	8.7	8.8	0.1	0%	Negligible
R63	9.5	9.8	0.3	1%	Negligible

Table 26-43 Annual Mean PM_{10} Results at Sensitive Human Receptor Locations for DBS East and DBS West Concurrent Construction

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean PM_{10} Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
Hull City Council					
R1	20.1	20.7	0.6	1%	Negligible
R2	17.7	18.0	0.3	1%	Negligible
R30	15.6	15.8	0.2	0%	Negligible
R31	15.2	15.4	0.2	1%	Negligible
R32	15.4	15.6	0.3	1%	Negligible
R33	14.6	14.8	0.2	1%	Negligible
R34	16.4	16.6	0.2	0%	Negligible
R35	16.1	16.2	0.1	0%	Negligible
R36	17.0	17.3	0.3	1%	Negligible
R37	15.8	15.9	0.2	0%	Negligible
R38	16.2	16.4	0.2	1%	Negligible
R39	17.3	17.6	0.3	1%	Negligible
R40	15.8	15.9	0.2	0%	Negligible
R41	15.8	16.0	0.2	1%	Negligible
R42	15.3	15.4	0.1	0%	Negligible
R43	15.8	15.9	0.1	0%	Negligible

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean PM_{10} Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
R44	14.4	14.6	0.1	0%	Negligible
East Riding of Yorkshire					
R3	17.5	17.6	0.2	0%	Negligible
R4	17.5	17.8	0.3	1%	Negligible
R5	16.0	16.2	0.2	0%	Negligible
R6	19.3	19.5	0.3	1%	Negligible
R7	15.8	16.0	0.2	0%	Negligible
R8	15.8	16.0	0.2	1%	Negligible
R9	15.2	15.6	0.4	1%	Negligible
R10	15.6	15.9	0.3	1%	Negligible
R11	16.9	17.2	0.3	1%	Negligible
R12	16.7	17.2	0.6	1%	Negligible
R13	14.1	14.2	0.1	0%	Negligible
R14	14.4	14.5	0.1	0%	Negligible
R15	14.0	14.2	0.2	1%	Negligible
R16	14.8	15.3	0.4	1%	Negligible
R17	13.1	13.3	0.2	0%	Negligible
R18	16.5	16.9	0.4	1%	Negligible

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean PM_{10} Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
R19	16.2	16.7	0.5	1%	Negligible
R20	17.6	18.1	0.5	1%	Negligible
R21	14.2	14.3	0.1	0%	Negligible
R22	14.5	14.6	0.1	0%	Negligible
R23	14.9	15.0	0.1	0%	Negligible
R24	15.5	15.6	0.1	0%	Negligible
R25	15.8	15.9	0.2	0%	Negligible
R26	16.3	16.5	0.2	1%	Negligible
R27	15.4	15.5	0.1	0%	Negligible
R28	15.5	15.6	0.1	0%	Negligible
R29	15.6	15.7	0.1	0%	Negligible
R45	14.7	14.8	0.1	0%	Negligible
R46	15.7	15.9	0.3	1%	Negligible
R47	14.9	15.0	0.07	0%	Negligible
R48	16.0	16.2	0.19	0%	Negligible
R49	13.4	13.4	0.03	0%	Negligible
R50	15.1	15.2	0.08	0%	Negligible
R51	13.0	13.0	0.02	0%	Negligible

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean PM_{10} Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
R52	12.7	12.7	0.08	0%	Negligible
R53	14.4	14.5	0.05	0%	Negligible
R54	15.1	15.2	0.09	0%	Negligible
R55	13.3	13.5	0.20	0%	Negligible
R56	15.2	15.2	0.05	0%	Negligible
R57	14.0	14.1	0.03	0%	Negligible
R58	14.8	14.8	0.09	0%	Negligible
R59	13.7	13.7	0.05	0%	Negligible
R60	12.6	12.6	0.02	0%	Negligible
R61	13.7	13.8	0.03	0%	Negligible
R62	15.1	15.1	0.06	0%	Negligible
R63	13.9	14.0	0.11	0%	Negligible

Table 26-44 Short Term Mean PM_{10} Results at Sensitive Human Receptor Locations for DBS East and DBS West Concurrent Construction

Receptor ID	DBS East and DBS West Concurrent Construction		
	2026 Number of Days >50µg.m^{-3} (Objective being less than 35 exceedances per year)		
	Without DBS East or DBS West	With DBS East and DBS West	Change
Hull City Council			
R1	4	4	1
R2	1	1	0
R30	0	0	0
R31	0	0	0
R32	0	0	0
R33	0	0	0
R34	0	1	0
R35	0	0	0
R36	1	1	0
R37	0	0	0
R38	0	0	0
R39	1	1	0
R40	0	0	0
R41	0	0	0
R42	0	0	0
R43	0	0	0
R44	0	0	0

Receptor ID	DBS East and DBS West Concurrent Construction		
	2026 Number of Days >50µg.m^{-3} (Objective being less than 35 exceedances per year)		
	Without DBS East or DBS West	With DBS East and DBS West	Change
East Riding of Yorkshire			
R3	1	1	0
R4	1	1	0
R5	0	0	0
R6	3	3	0
R7	0	0	0
R8	0	0	0
R9	0	0	0
R10	0	0	0
R11	1	1	0
R12	1	1	0
R13	0	0	0
R14	0	0	0
R15	0	0	0
R16	0	0	0
R17	0	0	0
R18	0	1	0
R19	0	1	0
R20	1	1	0

Receptor ID	DBS East and DBS West Concurrent Construction		
	2026 Number of Days >50µg.m^{-3} (Objective being less than 35 exceedances per year)		
	Without DBS East or DBS West	With DBS East and DBS West	Change
R21	0	0	0
R22	0	0	0
R23	0	0	0
R24	0	0	0
R25	0	0	0
R26	0	0	0
R27	0	0	0
R28	0	0	0
R29	0	0	0
R45	0	0	0
R46	0	0	0
R47	0	0	0
R48	0	0	0
R49	0	0	0
R50	0	0	0
R51	1	1	0
R52	1	1	0
R53	0	0	0
R54	0	0	0

Receptor ID	DBS East and DBS West Concurrent Construction		
	2026 Number of Days >50µg.m^{-3} (Objective being less than 35 exceedances per year)		
	Without DBS East or DBS West	With DBS East and DBS West	Change
R55	0	0	0
R56	0	0	0
R57	0	0	0
R58	0	0	0
R59	0	0	0
R60	1	1	0
R61	0	0	0
R62	0	0	0
R63	0	0	0
Values have been rounded to the nearest whole number therefore the change observed between without and with DBS East and DBS West does not always equate to an overall change of the same magnitude.			

Table 26-45 Annual Mean $PM_{2.5}$ Results at Sensitive Human Receptor Locations for DBS East or DBS West Concurrent Construction

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) Objective = 20$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
Hull City Council					
R1	12.1	12.4	0.33	1%	Negligible
R2	10.8	11.0	0.17	1%	Negligible
R30	9.7	9.8	0.08	0%	Negligible
R31	9.3	9.4	0.12	0%	Negligible
R32	9.4	9.5	0.14	1%	Negligible
R33	9.1	9.2	0.13	1%	Negligible
R34	10.5	10.6	0.08	0%	Negligible
R35	10.3	10.4	0.05	0%	Negligible
R36	11.0	11.2	0.17	1%	Negligible
R37	10.0	10.1	0.09	0%	Negligible
R38	10.2	10.4	0.11	0%	Negligible
R39	10.9	11.1	0.19	1%	Negligible
R40	10.0	10.1	0.09	0%	Negligible
R41	9.6	9.7	0.12	0%	Negligible
R42	9.2	9.3	0.07	0%	Negligible
R43	10.3	10.4	0.06	0%	Negligible

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) Objective = 20$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
R44	9.3	9.3	0.06	0%	Negligible
East Riding of Yorkshire					
R3	10.3	10.4	0.09	0%	Negligible
R4	10.3	10.4	0.15	1%	Negligible
R5	9.5	9.6	0.10	0%	Negligible
R6	10.9	11.0	0.13	1%	Negligible
R7	8.6	8.7	0.10	0%	Negligible
R8	8.5	8.6	0.12	0%	Negligible
R9	8.5	8.8	0.20	1%	Negligible
R10	8.5	8.7	0.13	1%	Negligible
R11	9.1	9.3	0.14	1%	Negligible
R12	9.2	9.5	0.32	1%	Negligible
R13	7.8	7.9	0.06	0%	Negligible
R14	8.0	8.0	0.08	0%	Negligible
R15	8.4	8.5	0.12	0%	Negligible
R16	8.8	9.1	0.25	1%	Negligible
R17	7.8	7.9	0.09	0%	Negligible
R18	9.0	9.2	0.24	1%	Negligible

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) Objective = 20$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
R19	8.8	9.0	0.28	1%	Negligible
R20	9.3	9.6	0.27	1%	Negligible
R21	7.7	7.7	0.04	0%	Negligible
R22	7.5	7.6	0.04	0%	Negligible
R23	7.8	7.9	0.07	0%	Negligible
R24	8.4	8.5	0.07	0%	Negligible
R25	8.5	8.6	0.08	0%	Negligible
R26	8.6	8.7	0.11	0%	Negligible
R27	8.2	8.2	0.06	0%	Negligible
R28	8.1	8.1	0.04	0%	Negligible
R29	8.2	8.2	0.04	0%	Negligible
R45	8.7	8.7	0.08	0%	Negligible
R46	8.5	8.6	0.15	1%	Negligible
R47	7.9	7.9	0.04	0%	Negligible
R48	8.5	8.6	0.11	0%	Negligible
R49	7.1	7.1	0.02	0%	Negligible
R50	8.0	8.0	0.04	0%	Negligible
R51	7.0	7.0	0.01	0%	Negligible

Receptor ID	DBS East and DBS West Concurrent Construction				
	2026 Annual Mean $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) Objective = 20$\mu g.m^{-3}$				
	Without DBS East or DBS West	With DBS East and DBS West	Change	Change as % of the Objective	Impact Descriptor
R52	6.9	7.0	0.04	0%	Negligible
R53	7.6	7.6	0.03	0%	Negligible
R54	7.9	8.0	0.05	0%	Negligible
R55	7.9	8.0	0.11	0%	Negligible
R56	7.9	7.9	0.03	0%	Negligible
R57	7.4	7.4	0.02	0%	Negligible
R58	7.8	7.8	0.05	0%	Negligible
R59	7.2	7.3	0.03	0%	Negligible
R60	6.9	6.9	0.01	0%	Negligible
R61	7.2	7.2	0.02	0%	Negligible
R62	7.9	8.0	0.04	0%	Negligible
R63	7.8	7.8	0.06	0%	Negligible

Table 26-46 Comparison of Annual Mean NO_2 Results at Sensitive Human Receptor Locations in Hull City Council for DBS East and DBS West Concurrent Construction Against Monitored Concentrations at Sites Operated by Hull City Council

DBS East and DBS West Concurrent Construction						
Comparison of 2026 Annual Mean NO_2 Concentrations against 2019 monitored concentrations within Hull City Council (µg.m^{-3})						
Receptor ID	**Without DBS East or DBS West (µg.m^{-3})**	**With DBS East or DBS West (µg.m^{-3})**	**Nearest representative Monitoring Site ID Operated By Hull City Council**	**2019 Monitored Conc. (µg.m^{-3})**	**Change (µg.m^{-3})**	**Impact Descriptor**
R1	26.7	27.6	S13	31.9	-4.3	Negligible
R2	22.9	23.4	S13	31.9	-8.5	Negligible
R30	18.9	19.2	S30	23.9	-4.7	Negligible
R31	16.7	17.1	S44	30.9	-13.8	Negligible
R32	17.3	17.9	S44	30.9	-13.1	Negligible
R33	22.3	22.6	S44	30.9	-8.3	Negligible
R34	17.5	17.8	-	-	-	Negligible
R35	16.8	17.1	-	-	-	Negligible
R36	21.4	22.0	-	-	-	Negligible
R37	18.5	19.0	S48	38.2	-19.2	Negligible
R38	20.0	20.7	S48	38.2	-17.5	Negligible
R39	24.1	25.3	-	-	-	Negligible
R40	20.6	21.2	-	-	-	Negligible
R41	15.2	15.8	-	-	-	Negligible
R42	13.1	13.3	-	-	-	Negligible
R43	16.6	16.8	CM3	30.6	-13.8	Negligible

DBS East and DBS West Concurrent Construction						
Comparison of 2026 Annual Mean NO_2 Concentrations against 2019 monitored concentrations within Hull City Council (µg.m^{-3})						
Receptor ID	**Without DBS East or DBS West (µg.m^{-3})**	**With DBS East or DBS West (µg.m^{-3})**	**Nearest representative Monitoring Site ID Operated By Hull City Council**	**2019 Monitored Conc. (µg.m^{-3})**	**Change (µg.m^{-3})**	**Impact Descriptor**
R44	14.6	14.8	CM3	30.6	-15.8	Negligible

259. The results of the construction phase road traffic emissions assessment show that annual mean concentrations of NO_2 (**Table 26-42**), PM_{10} (see **Table 26-43**) and $PM_{2.5}$ (see **Table 26-45**) are predicted to be well below (i.e. less than 75% of) the respective air quality Objectives in the peak construction (2026) DBS East and DBS West concurrent construction at all receptors, both 'with' and 'without' DBS East and DBS West in place.

260. The impact of DBS East and DBS West concurrent construction is 'negligible' at all receptors, in accordance with IAQM and EPUK guidance (IAQM & EPUK, 2017).

261. As detailed in **Table 26-46**, the predicted annual mean concentration at all modelled receptors under DBS East and DBS West concurrent construction are lower than the comparative concentrations recorded in 2019. The impact of the DBS East and DBS West is therefore considered negligible in accordance with the Hull City Council supplementary planning guidance 'Air Quality Guidance for Planners and Developers' (Hull City Council, 2018).

262. All predicted NO_2 concentrations are well below 60µg.m^{-3} and therefore, in accordance with Defra guidance (Defra, 2021a), the 1-hour mean Objective is unlikely to be exceeded (see **Table 26-5**). Based on the calculation provided by Defra, as detailed in section 26.4.3.3, the short-term PM_{10} Objective was predicted to be met at all modelled locations (the Objective being less than 35 exceedances of 50 µg.m^{-3} as a daily mean). As shown in **Table 26-44**, there was no change in the number of days exceeding the daily mean Objective between the 'without' and 'with' DBS East and DBS West concurrent construction assessments, using the Defra (2022) calculation.

263. The assessment therefore concludes that impacts generated by road traffic upon local air quality are not significant in the DBS East and DBS West concurrent construction scenario.

26.6.1.3.2.2 Ecological Receptors

264. Table 26-47 and Table 26-48 present the potential contribution of the Project-generated (i.e., 'DBS East or DBS West) and Project contribution (i.e. 'DBS East and DBS West concurrent construction) (see section 26.4.3.3.7), respectively, on the sensitive features under each designation. Values in exceedance of 1% of the Critical Load or Level, i.e., those which cannot be considered to be insignificant, are shown in bold text.

Table 26-47 DBS East or DBS West Concurrent Construction – Maximum Contribution of Project-generated NOx, NH_3, N-dep and Acid Deposition from Traffic on Feature(s) under Designation Ecological Sites

Figures highlighted in bold are those which cannot be considered insignificant

Link	Designated Ecological Site			DBS East or DBS West Concurrent Construction Road Traffic Contribution – Project Alone									
				Concentration or Flux				% of Critical Level or Critical Load					
	Site Type	Name	Feature Name	NOx	NH_3	N-Dep	Acid-Dep	NOx	NH_3		N-Dep		Acid-Dep	
				$\mu g.m^{-3}$	$\mu g.m^{-3}$	$kgN.ha^{-1}.yr^{-1}$	$keq.ha^{-1}.yr^{-1}$	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
26	SAC/SSSI	Humber Estuary	Pioneer, low-mid, mid-upper saltmarshes	1.086	0.025	0.227	NS	**3.6%**	**2.5%**	0.8%	**1.1%**	0.8%	-	-
26	SAC	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide	1.086	0.025	NC	NS	**3.6%**	**2.5%**	0.8%	-	-	-	-
26	SPA/SSSI	Humber Estuary	Pioneer, low-mid, mid-upper saltmarshes	1.086	0.025	0.227	NI/NS	**3.6%**	0.8%	0.8%	**1.1%**	0.8%	-	-
26	LNR	Humber Bridge	Broadleaved deciduous woodland (MAGIC)	1.432	0.032	-*	-*	**4.8%**	**1.1%**	**1.1%**	-	-	-	-
28	LNR	Humber Bridge	Broadleaved deciduous woodland (MAGIC)	0.185	0.007	-*	-*	0.6%	0.2%	0.1%	-	-	-	-
29	SAC	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide	0.758	0.016	NC	NS	**2.5%**	**1.6%**	0.5%	-	-	-	-
29	LNR	Humber Bridge	Broadleaved deciduous woodland (MAGIC)	0.185	-	-*	-*	0.6%	-	-	-	-	-	-
63	AW	Unnamed woodland (ID1)	Coniferous woodland	0.165	0.006	0.130	0.009	0.6%	0.6%	0.2%	**2.6%**	0.9%	0.1%	0.1%

AW = Ancient Woodland;NC= No comparable habitat with established critical load estimate available; NI= No expected negative impact on the species due to impacts on the species' broad habitat; NS = Not Sensitive

* Critical Loads were not assessed at LNRs as details of the specific habitats were not available

Table 26-48 DBS East or DBS West Concurrent Construction – Maximum Contribution of In-combination NOx, NH3, N-dep and Acid Deposition from Traffic on Feature(s) under Designation Ecological Sites

Figures highlighted in bold are those which cannot be considered insignificant

	Designated Ecological Site			**Scenario 1 'DBS East or DBS West in Concurrent Construction' In-combination Contribution**									
				Concentration or Flux				**% of Critical Level or Critical Load**					
	Site Type	**Name**	**Feature Name**	**NOx**	**NH_3**	**N-Dep**	**Acid-Dep**	**NOx**	**NH_3**		**N-Dep**		**Acid-Dep**	
				$\mu g.m^{-3}$	**$\mu g.m^{-3}$**	**$kgN.ha^{-1}.yr^{-1}$**	**$keq.ha^{-1}.yr^{-1}$**	**-**	**% of lower CL**	**% of upper CL**	**% of lower CL**	**% of upper CL**	**% of lower CL**	**% of upper CL**
26	SAC/SSSI	Humber Estuary	Pioneer, low-mid, mid-upper saltmarshes	7.626	0.173	1.595	NS	**25.4%**	**17.3%**	**5.8%**	**8.0%**	**5.3%**	-	-
26	SAC	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide	7.626	0.173	NC	NS	**25.4%**	**17.3%**	**5.8%**	-	-	-	-
26	SPA/SSSI	Humber Estuary	Pioneer, low-mid, mid-upper saltmarshes	7.626	0.173	1.595	NI/NS	**25.4%**	**5.8%**	**5.8%**	**8.0%**	**5.3%**	-	-
26	LNR	Humber Bridge	Broadleaved deciduous woodland (predominantly, based on priority mapping on MAGIC)	10.052	0.222	-*	-*	**33.5%**	**7.4%**	**7.4%**	-	-	-	-
28	LNR	Humber Bridge	Broadleaved deciduous woodland (predominantly, based on priority mapping on MAGIC)	0.561	0.020	-*	-*	**1.9%**	0.7%	0.7%	-	-	-	-
29	SAC	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide	4.685	0.102	NC	NS	**15.6%**	**10.2%**	**3.4%**	-	-	-	-
29	LNR	Humber Bridge	Broadleaved deciduous woodland (predominantly, based on priority mapping on MAGIC)	1.145	-	-*	-*	**3.8%**	**-**	**-**	-	-	-	-
63	AW	Unnamed woodland (ID1)	Coniferous woodland	0.364	0.014	0.286	0.020	**1.2%**	**1.4%**	0.5%	**5.7%**	**1.9%**	0.2%	0.2%

AW = Ancient Woodland; NC= No comparable habitat with established critical load estimate available; NI= No expected negative impact on the species due to impacts on the species' broad habitat; NS = Not Sensitive

* Critical Loads were not assessed at LNRs as details of the specific habitats were not available

265. Similar to DBS East or DBS West in isolation, **Table 26-47** shows that there are several sites which are predicted to experience in-combination impacts significantly in excess of 1% of the Critical Load or Level. However, as shown in **Table 26-48**, only a small percentage of impacts at all sites is due to the contribution from DBS East and DBS West together concurrently. Furthermore, as previously discussed, the impact of DBS East and DBS West would be experienced only during construction. The impact of other in-combination plans and projects, (with the exception of other offshore wind farms within the study area for which the same applies), for example traffic generated as a result of residential and employment developments associated with regional Local Plan allocations, would be experienced over a significantly longer duration. Any sites where the NOx, NH_3, N-dep and/or Acid deposition are predicted to be above 1% of the relevant Critical Level or Load, cannot be considered to be insignificant. As such, the significance of impacts is discussed in **Chapter 9 Benthic Habitats** and **Chapter 18 Terrestrial Ecology and Ornithology**.

26.6.2 Potential Effects During Operation

266. Operational phase impacts have been scoped out of the assessment with the exception of energy balancing infrastructure, as discussed in **Table 26-1** and therefore have not been considered within this assessment.

26.6.3 Potential Effects During Decommissioning

267. No decision has been made regarding the final decommissioning policy for DBS East or DBS West, as it is recognised that industry best practice, rules and legislation change over time. It is likely the cables would be pulled through the ducts and recycled, with the transition pits and ducts capped and sealed then left in situ.

26.7 Preliminary Assessment of Cumulative Effects

268. As detailed in section 26.4.4, this section presents a preliminary assessment of cumulative effects in relation to air quality. The final CEA will be undertaken within the ES chapter.

26.7.1 Initial Screening for Cumulative Effects

269. **Table 26-49** below details the potential cumulative effects that may occur between the Projects and other plans, projects and activities. Only potential impacts assessed in section 26.4.4 where the potential for cumulative effects has been identified (minor, moderate or major) will be taken forward to the final CEA (i.e. those assessed as 'no impact' are not taken forward as there is no potential for them to contribute to a cumulative impact).

Table 26-49 Potential Cumulative Effects

Impact	Potential for Cumulative Effects	Data Confidence	Rationale
Construction			
Impact 1: Construction dust and fine particulate matter	Yes	Medium	There is potential for cumulative construction dust impacts where projects occur within 700m of each other, as dust impacts are considered within a 350m buffer from each project, as detailed in Section 26.4.3.1. Therefore, two projects would need to be within 700m of each other for cumulative dust impacts to occur.
Impact 2: NRMM Emissions	Yes	Low	There is potential for cumulative NRMM emission impacts where projects overlap.

Impact	Potential for Cumulative Effects	Data Confidence	Rationale
Impact 3: Construction phase road traffic emissions	Yes	High	Where the construction phase of the Projects overlaps with other projects, there is the potential for cumulative impacts associated with Projects-generated traffic emissions on the local road network.
Operation & Maintenance			
Impact 1: Energy balancing infrastructure	Yes	Low	There is potential for cumulative emissions from backup generators where projects overlap.
Decommissioning			
The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan would be provided. As such, cumulative impacts during the decommissioning stage are assumed to be the same as those identified during the construction stage.			

26.7.2 Plans/Projects Considered for Cumulative Impacts

270. A high-level list of plans/projects that may result in cumulative effects with the Projects is detailed in **Table 26-50.** For air quality, the search criteria detailed in **Table 26-49** have been used to determine the initial list of projects considered for the CEA.

271. Plans / projects have been assigned a tier level between 1 and 7, based on the most recent guidance (see **Chapter 6 EIA Methodology**). For the final CEA at the ES stage, this high-level list will be reviewed and screened to ensure all relevant plans / projects are considered in the final assessment. All listed plans / projects will be re-examined at the ES stage to ensure each assigned tier remains accurate at the time of writing.

Table 26-50 High-Level List of Plans/Projects Screened for Further Assessment in the Final CEA

Tier	Plan / Project	Distance to Onshore Development Area (km)
2	Dogger Bank A & B Offshore Wind Farm	Crosses onshore export cable corridor
3	A164 and Jocks Lodge Junction Improvement Scheme	Crosses onshore export cable corridor
3	Solar Farm – Land south of Creyke Beck Substation, 4875 Park Lane, Cottingham	Within Onshore Development Area
3	Solar Farm – Land east and west of West of Tickton Bridge Plantation, Main Road, Routh	Adjacent to the Onshore Development Area
4	Hornsea Project Four Offshore Wind Farm	Adjacent to onshore export cable corridor
4	Scotland England Green Link 2	3.5
4	Solar Farm – Land north east and west of Carr Plantation, Ferry Road, Wawne	1.5
4	Household Recycling Centre – Land north west of Ings Road Picnic Site, Molescroft	Within Onshore Development Area
6	Solar Farm – Robson & Co, White Hall, Shepard Lane, Woodmansey	Within Onshore Development Area
7	New National Grid Substation (Birkill Wood)	Within Onshore Development Area
7	North Humber to High Marnham	Within Onshore Development Area
7	Creyke Beck Substation Extension	400m from Onshore Development Area

26.8 Potential Monitoring Requirements

272. No air quality monitoring is proposed as no significant effects were predicted. Visual dust inspections will be undertaken as part of the dust management measures as detailed in section 26.6.1.1.5.

26.9 Interactions

273. The effects identified and assessed in this chapter have the potential to interact with each other, which could give rise to synergistic impacts as a result of that interaction. The areas of potential interaction between effects are presented in **Table 26-51**. This provides a screening tool for which effects have the potential to interact. For clarity the areas of potential interaction between impacts are presented in **Table 26-52**, along with an indication as to whether the interaction may give rise to synergistic impacts.

274. **Table 26-52** provides an assessment for each receptor group (i.e., human or ecological) as related to these impacts. Within **Table 26-52** the impacts are assessed relative to construction (it is assumed decommissioning impacts would be no greater than those during construction, so have not been included to prevent repetition) to see if multiple construction impacts affecting the same receptor could increase the level of impact upon that receptor. The worst case impacts assessed within the chapter take these interactions into account and for the impact assessments are considered conservative and robust.

Table 26-51 Interactions Between Impacts During Construction

Potential Interactions between Impacts			
Construction			
	Impact 1: Construction dust and fine particulate matter	Impact 2: NRMM emissions	Impact 3: Construction road vehicle exhaust emissions
Impact 1: Construction dust and fine particulate matter	-	Yes	Yes
Impact 2: NRMM emissions	Yes	-	Yes
Impact 3: Construction road vehicle exhaust emissions	Yes	Yes	-
Operation			
Operational impacts on air quality have been scoped out.			

Table 26-52 Inter-relationships Between Impacts During Construction

Receptor	Highest Significance Level during construction	Construction phase assessment
Human receptors	Impact 1: not significant with the implementation of mitigation measures detailed in section 26.6.1.1.5. Impact 2: not significant with the implementation of good practice mitigation measures detailed in section 26.6.1.2.5. Impact 3: not significant (negligible impact at all receptors)	**No greater than individually assessed impact** The proposed mitigation will minimise the potential for significant impacts on human receptors (Impact 1 and 2) within the study area and no significant impacts are predicted for Impact 3 during the construction phase of the Projects. Very few human receptors have the potential to be affected by all three construction impacts. Notwithstanding this, background pollutant concentrations in the study area are low (see **Table 26-27**) and therefore it is unlikely that the air quality Objectives would be exceeded even in the unlikely event of the impacts interacting. It is therefore considered that interactions will not exacerbate the potential impacts associated with these activities during construction.
Ecological receptors	Impact 1: not significant with the implementation of mitigation measures detailed in section 26.6.1.1.5. Impact 2: not significant with the implementation of good practice mitigation measures detailed in section 26.6.1.2.5. Impact 3: see **Chapter 9 Benthic Habitats** and **Chapter 18 Terrestrial Ecology and Ornithology**.	**No greater than individually assessed impact** The proposed mitigation will minimise the potential for significant impacts on ecological receptors (Impact 1 and 2) within the study area during the construction phase of DBS East or DBS West Very few ecological receptors (i.e. Burton Bushes SSSI and the Unnamed Ancient Woodland within the indicative substation zone) have the potential to be affected by all three construction phase impacts. It is therefore considered that interactions will not exacerbate the potential impacts associated with these activities during construction.

26.10 Inter-relationships

275. For air quality there are potential inter-relationships between other topics assessed within this PEIR including Terrestrial Ecology, Benthic Ecology, Transport, Human Health and Climate Change. A summary of the potential inter-relationships between Onshore Archaeology, Transport, Human Health and Climate Change is provided in **Table 26-53**.

Table 26-53 Air Quality Inter-relationships

Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
Construction			
Impact 1: Construction dust and fine particulate matter	**Chapter 27 Human Health**	Section 26.6.1.1	There could be the potential for human health impacts associated with increases in pollutant concentrations at sensitive receptors.
	Chapter 9 Benthic Habitats and **Chapter 18 Terrestrial Ecology and Ornithology**	Section 26.6.1.3.1.2.	Ecological receptors may be impacted by changes to air quality.
Impact 2: NRMM emissions	**Chapter 27 Human Health**	Section 26.6.1.2	There could be the potential for human health impacts associated with NRMM emissions.
	Chapter 9 Benthic Habitats and **Chapter 18 Terrestrial Ecology and Ornithology**	Section 26.6.1.2	Ecological receptors may be impacted by changes to air quality resulting from NRMM emissions.

Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
Impact 3: Construction road vehicle exhaust emissions	**Chapter 24 Traffic and Transport**	Section 26.6.1.3	Pollutant emissions from traffic movements associated with DBS East and/or DBS West have the potential to impact on air quality.
	Chapter 9 Benthic Habitats and **Chapter 18 Terrestrial Ecology and Ornithology**	Section 26.6.1.3.1.2	Ecological receptors may be impacted by changes to air quality resulting from construction road vehicle exhaust emissions. Impacts and the significance of effects are discussed in **Chapter 9 Benthic Habitats** and **Chapter 18 Terrestrial Ecology and Ornithology.**
	Chapter 27 Human Health	Section 26.6.1.2	There could be the potential for human health impacts associated with increases in pollutant concentrations at sensitive receptors.

26.11 Summary

276. This report has provided a characterisation of the existing air quality conditions and an assessment of the onshore air quality impacts and potential for significant effects due to the construction and decommission phases of the Projects. Onshore operation and maintenance and offshore air quality impacts have been scoped out.

277. The assessment has been undertaken with reference to relevant legislation, policy and guidance and the assessment methodology agreed with the relevant councils.

278. The effect of construction dust and fine particulate matter from the Projects on human and ecological receptors is considered not significant with the implementation of site specific mitigation measures.

279. The effect of NRMM emissions on human and ecological receptors is considered not significant with the implementation of relevant embedded control and management measures.

280. The effect of Projects-generated road traffic emissions on existing human receptors was predicted to be not significant. The impact on designated ecological sites of increases in traffic were also considered and compared to the appropriate Critical Loads and Levels. Whilst some impacts were predicted to be below the threshold of insignificance, the impacts of certain pollutants require specific ecological consideration to determine the significance of effect (which will be addressed in the terrestrial ecology and ornithology assessment presented in the ES).

281. A summary of the potential impacts identified with relation to air quality is provided in **Table 26-54**.

Table 26-54 Summary of Potential Likely Significant Effects on Air Quality

Potential Impact	Project	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Construction							
Impact 1: Construction dust and fine particulate matter	DBS East or DBS West	Human receptors within 350m of the Onshore Development Area (and/or within 50m of HGV routes up to 500m from the Onshore Development Area	Dust soiling: low to medium	Low to medium risk	Assessment methodology does not assign significance before mitigation.	Measures as recommended by the IAQM (see section 26.6.1.1.5).	**Not significant**
			Human health: low	Low risk			
		Ecological receptors within 200m of the Onshore Development Area (and/or within 50m of HGV routes up to 500m from the Onshore Development Area)	Ecological effects: high	Medium to high risk			
	DBS East and DBS West	Human receptors within 350m of the Onshore Development Area (and/or within 50m of HGV routes up to 500m from the Onshore Development Area	Dust soiling: low to medium	Low to medium risk			
			Human health: low	Low risk			
		Ecological receptors within 200m of the Onshore Development Area (and/or within 50m of HGV routes up to 500m from the Onshore Development Area)	Ecological effects: high	Medium to high risk			

Potential Impact	Project	Receptor	Sensitivity	Magnitude of Impact		Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Impact 2: NRMM emissions	DBS East and/or DBS West	Human and ecological receptors within close proximity to NRMM works within the Onshore Development Area	High	N/A	Defra technical guidance (Defra, 2022b) states that emissions from NRMM used on construction sites are unlikely to have a significant impact on local air quality where relevant control and management measures are employed.	Good practice mitigation measures (see section 26.6.1.2.5).	**Not significant**	
Impact 3: Construction road vehicle exhaust emissions	DBS East or DBS West	Residential properties, schools, hospitals and care homes within 200m of roads		The predicted impact of DBS East or DBS West at all receptors for all pollutants was 'negligible'.	**Not significant** negligible impact at all receptors.	No additional mitigation measures required	**Not significant**	
		Designated ecological sites within 200m of affected roads	High	See **Chapter 18 Terrestrial Ecology and Ornithology**				
	DBS East and DBS West	Residential properties, schools, hospitals and care homes within 200m of roads		The predicted impact of DBS East and DBS West at all receptors for all pollutants was 'negligible'.	**Not significant** negligible impact at all receptors	No additional mitigation measures required	**Not significant**	

Potential Impact	Project	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
		Designated ecological sites within 200m of affected roads	High	See **Chapter 18 Terrestrial Ecology and Ornithology**			
Operation							
Operational impacts on air quality have been scoped out.							
Decommissioning							
As per construction							

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