DOGGER BANK D
WIND FARM
Preliminary Environmental Information Report

Volume 1
Chapter 20 Air Quality and Dust

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Glossary

Term	Definition
Additional Mitigation	Measures identified through the EIA process that are required as further action to avoid, prevent, reduce or, if possible, offset likely significant adverse effects to acceptable levels (also known as secondary (foreseeable) mitigation). All additional mitigation measures adopted by the Project are provided in the Commitments Register.
Ancient Woodland	Typically, a woodland that has existed continuously since 1600 or before (this can include areas where trees have been cut down and / or replanted).
Birkhill Wood Substation	The onshore grid connection point for DBD identified through the Holistic Network Design process. Birkhill Wood Substation which is being developed by National Grid Electricity Transmission and does not form part of the Project.
Commitment	Refers to any embedded mitigation and additional mitigation, enhancement or monitoring measures identified through the EIA process and those identified outside the EIA process such as through stakeholder engagement and design evolution. All commitments adopted by the Project are provided in the Commitments Register.
Critical Level	A concentration of gaseous pollutants, below which significant harmful effects on designated ecological sites are not thought to occur according to present knowledge.
Critical Load	A quantitative estimate of an exposure to one or more pollutants, below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge.
Design	All of the decisions that shape a development throughout its design and pre-construction, construction / commissioning, operation and, where relevant, decommissioning phases.
Development Consent Order (DCO)	A consent required under Section 37 of the Planning Act 2008 to authorise the development of a Nationally Significant Infrastructure Project, which is granted by the relevant Secretary of State following an application to the Planning Inspectorate.
Effect	An effect is the consequence of an impact when considered in combination with the receptor's sensitivity / value / importance, defined in terms of significance.

Term	Definition
Embedded Mitigation	Embedded mitigation includes: • Measures that form an inherent part of the project design evolution such as modifications to the location or design of the development made during the pre-application phase (also known as primary (inherent) mitigation); and • Measures that will occur regardless of the EIA process as they are imposed by other existing legislative requirements or are considered as standard or best practice to manage commonly occurring environmental impacts (also known as tertiary (inexorable) mitigation). All embedded mitigation measures adopted by the Project are provided in the Commitments Register.
Energy Storage and Balancing Infrastructure (ESBI)	A range of technologies such as battery banks to be co-located with the Onshore Converter Station, which provide valuable services to the electrical grid such as storing energy to meet periods of peak demand and improving overall reliability.
Enhancement	Measures committed to by the Project to create or enhance positive benefits to the environment or communities, as a result of the Project. All enhancement measures adopted by the Project are provided in the Commitments Register.
Environmental Impact Assessment (EIA)	A process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information and includes the publication of an Environmental Statement.
Environmental Statement (ES)	A document reporting the findings of the EIA which describes the measures proposed to mitigate any likely significant effects.
European Sites	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in Regulation 8 of the Conservation of Habitats and Species Regulations 2017 and Regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Special Areas of Conservation, Sites of Community Importance, and Special Protection Areas. Now referred to as the National Site Network in the UK.
Evidence Plan Process (EPP)	A voluntary consultation process with technical stakeholders which includes a Steering Group and Expert Topic Group (ETG) meetings to encourage upfront agreement on the nature, volume and range of supporting evidence required to inform the EIA and HRA process.
Expert Topic Group (ETG)	A forum for targeted technical engagement with relevant stakeholders through the EPP.

Term	Definition
Grid Connection	The offshore and onshore electricity transmission network connection to Birkhill Wood Substation.
Haul Roads	Temporary tracks set aside to facilitate transport access during onshore construction works.
Heavy Duty Vehicle (HDV)	Vehicles ≥3.5 tonnes. Includes Heavy Goods Vehicles, buses, coaches etc.
Impact	A change resulting from an activity associated with the Project, defined in terms of magnitude.
Jointing Bays	Underground structures constructed at regular intervals along the onshore export cable corridor to facilitate the joining of discrete lengths of the installation of cables.
Landfall	The area on the coastline, south-east of Skipsea, at which the offshore export cables are brought ashore, connecting to the onshore export cables at the transition joint bay above Mean High Water Springs.
Light Duty Vehicle (LDV)	Vehicles <3.5 tonnes. Includes Light Goods Vehicles, cars, vans etc.
Link Boxes	Structures housing electrical equipment located alongside the jointing bays in the onshore export cable corridor and the transition joint bay at the landfall, which could be located above or below ground.
Mitigation	Any action or process designed to avoid, prevent, reduce or, if possible, offset potentially significant adverse effects of a development. All mitigation measures adopted by the Project are provided in the Commitments Register.
Monitoring	Measures to ensure the systematic and ongoing collection, analysis and evaluation of data related to the implementation and performance of a development. Monitoring can be undertaken to monitor conditions in the future to verify any environmental effects identified by the EIA, the effectiveness of mitigation or enhancement measures or ensure remedial action are taken should adverse effects above a set threshold occur. All monitoring measures adopted by the Project are provided in the Commitments Register.
Offshore Construction Base Port(s)	The offshore construction base port(s) will be the home for the Project's service vessels, crew transfers and the control centre for managing marine logistics and traffic for offshore construction activities. At this stage, no decision has been made regarding which port(s) would be used for the Project's offshore construction. A decision upon the offshore construction base port(s) would not be made until post DCO determination.

Term	Definition
Onshore Converter Station(s) - OCS(s)	A compound containing electrical equipment required to stabilise and convert electricity generated by the wind turbines and transmitted by the export cables into a more suitable voltage for grid connection into Birkhill Wood Substation.
Onshore Development Area	The area in which all onshore infrastructure associated with the Project will be located, including any temporary works area required during construction and permanent land required for mitigation and enhancement areas, which extends landward of Mean Low Water Springs. There is an overlap with the Offshore Development Area in the intertidal zone.
Operation and Maintenance Base Port	The operation and maintenance (O&M) base port will be the home for the Project's service vessels, crew transfers and the control centre for managing marine logistics and traffic for offshore O&M activities. At this stage, no decision has been made regarding which port(s) would be used for the Project's offshore O&M activities. A decision upon an O&M base port would not be made until post DCO determination.
Onshore Export Cable Corridor (ECC)	The area within which the onshore export cables will be located, extending from the landfall to the Onshore Converter Station zone and onwards to Birkhill Wood Substation.
Project Design Envelope	A range of design parameters defined where appropriate to enable the identification and assessment of likely significant effects arising from a project's worst-case scenario. The Project Design Envelope incorporates flexibility and addresses uncertainty in the DCO application and will be further refined during the EIA process.
Special Area of Conservation (SAC)	Area(s) of protected habitat(s) and species as defined in the European Union Habitat Directive (92/43/EEC).
Special Protection Area (SPA)	A designated area for birds under the European Union Directive on the Conservation of Wild Birds (2009/147/EC).
Site of Special Scientific Interest (SSSI)	A geological or biological conservation designation denoting a nationally protected area in the UK.
Scoping Opinion	A written opinion issued by the Planning Inspectorate on behalf of the Secretary of State regarding the scope and level of detail of the information to be provided in the Applicant's Environmental Statement. The Scoping Opinion for the Project was adopted by the Secretary of State on 02 August 2024.

Term	Definition
Scoping Report	A request by the Applicant made to the Planning Inspectorate for a Scoping Opinion on behalf of the Secretary of State. The Scoping Report for the Project was submitted to the Secretary of State on 24 June 2024.
Study Areas	A geographical area and / or temporal limit defined for each EIA topic to identify sensitive receptors and assess the relevant likely significant effects.
Temporary Construction Compounds	Areas set aside to facilitate the construction works for the onshore infrastructure, which include the landfall construction compound, main and intermediate construction compounds for onshore export cable works and OCS and ESBI construction compounds.
The Applicant	SSE Renewables and Equinor acting through 'Doggerbank Offshore Wind Farm Project 4 Projco Limited'.
The Project	Dogger Bank D Offshore Wind Farm Project, also referred to as DBD in this PEIR.
Trackout	The transport of dust, dirt and debris from construction vehicles leaving the Onshore Development Area onto public highways up to 250m from Onshore Development Area vehicular exit(s). This can arise from HDVs carrying dusty materials from the Onshore Development Area or the transfer of mud and dirt onto the road which is resuspended as dust by wind and other road vehicles as it dries out.
Transition Joint Bay (TJB)	An underground structure at the landfall that houses the joints between the offshore and onshore export cables.
Trenching	Open cut method for cable or duct installation.
Trenchless Techniques	Trenchless cable or duct installation methods used to bring offshore export cables ashore at landfall, facilitate crossing major onshore obstacles such as roads, railways and watercourses and where trenching may not be suitable. Trenchless techniques included in the Project Design Envelope include Horizontal Directional Drilling (HDD), auger boring, micro-tunnelling, pipe jacking / ramming and Direct Pipe.

20 Air Quality and Dust

20.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) presents the preliminary results of the Environmental Impact Assessment (EIA) of the Dogger Bank D Offshore Wind Farm Project (hereafter "the Project" or "DBD") on air quality and dust.

2. **Chapter 4 Project Description** provides a description of the key infrastructure components which form part of the Project and the associated construction, operation and maintenance (O&M) and decommissioning activities.

3. The primary purpose of the PEIR is to support the statutory consultation activities required for a Development Consent Order (DCO) application under the Planning Act 2008. The information presented in this PEIR chapter is based on the baseline characterisation and assessment work undertaken to date. The feedback from the statutory consultation will be used to inform the design where appropriate and presented in an Environmental Statement (ES), which will be submitted with the DCO application.

4. This PEIR chapter:

   - Describes the baseline environment relating to air quality and dust;
   - Presents an assessment of the likely significant effects on air quality and dust during the construction, O&M and decommissioning phases of the Project;
   - Identifies any assumptions and limitations encountered in compiling the environmental information; and
   - Sets out proposed mitigation measures to avoid, prevent reduce or, if possible, offset potential significant adverse environmental effects identified during the EIA process and, where relevant, monitoring measures or enhancement measures to create or enhance positive effects.

5. This chapter should be read in conjunction with the following related chapters. Inter-relationships are discussed further in **Section 20.9.1**:

   - **Chapter 23 Onshore Ecology and Ornithology**;
   - **Chapter 26 Traffic and Transport**;
   - **Chapter 29 Human Health**; and
   - **Chapter 31 Climate Change**.

6. Additional information to support the air quality and dust assessment includes:

   - **Volume 2, Appendix 20.1 Consultation Responses for Air Quality and Dust**;
   - **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment Methodology**;
   - **Volume 2, Appendix 20.3 Construction Road Vehicle Exhaust Emissions Assessment – Traffic Data**;
   - **Volume 2, Appendix 20.4 Construction Vehicle Exhaust Emissions Assessment – Receptor Locations**; and
   - **Volume 2, Appendix 20.5 Construction Vehicle Exhaust Emissions Assessment – Ecological Transect Results**.

20.2 Policy and Legislation

20.2.1 National Policy Statements

7. Planning policy on energy Nationally Significant Infrastructure Projects (NSIP) is set out in the National Policy Statements (NPS). The following NPS is relevant to the air quality and dust assessment:

   - Overarching NPS for Energy (EN-1) (Department for Energy Security and Net Zero (DESNZ), 2023a).

8. The air quality and dust chapter has been prepared with reference to specific requirements in the above NPS. The relevant parts of the NPS are summarised in **Table 20-1**, along with how and where they have been considered in this PEIR chapter. The NPS for Renewable Energy Infrastructure (EN-3) (DESNZ, 2023b) and NPS for Electricity Networks Infrastructure (EN-5) (DESNZ, 2023c) do not include specific details on the assessment of air quality and dust.

20.2.2 Other Policy and Legislation

9. Other policy and legislation relevant to the air quality and dust assessment is summarised in the following sections.

20.2.2.1 National

10. European Union (EU) legislation forms the basis for UK air quality policy. The EU (Withdrawal Agreement) Act 2020 (HMSO, 2020) sets out arrangements for implementing the air quality limit values that are included in the EU Directive on Ambient Air Quality and Cleaner Air for Europe and in the Air Quality Regulations, as amended. 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 20-2**.

Table 20-1 Summary of Relevant National Policy Statement Requirements for Air Quality and Dust

NPS Reference and Requirement	How and Where Considered in the PEIR
NPS for Energy (EN-1)	
Paragraph 5.2.8: "Where the project is likely to have adverse effects on air quality the applicant should undertake an assessment of the impacts of the proposed project as part of the ES."	Assessment of potential impacts on air quality associated with the Project are discussed in **Section 20.7**.
Paragraph 5.2.9: "The ES should describe: • existing air quality concentrations and the relative change in air quality from existing levels; • any significant air quality effects, 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 emissions, concentration change and absolute concentrations as a result of the proposed project, after mitigation methods have been applied; and • any potential eutrophication impacts."	The baseline environment in relation to air quality within the Study Area are discussed in **Section 20.6**. Assessment of potential impacts associated with air pollution generated from the Project are discussed in **Section 20.7**. Embedded mitigation measures are discussed in **Section 20.4.2** and detailed in the **Outline Code of Construction Practice** (document reference 8.9), a draft version of which is provided with the PEIR and will be updated post-PEIR for the DCO application submission. Potential eutrophication impacts are discussed in **Chapter 23 Terrestrial Onshore Ecology and Ornithology.**
Paragraph 5.2.10: "In addition, applicants should consider the Environment Targets (Fine Particulate Matter) (England) Regulations 2022 and associated Defra guidance."	The assessment considers the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023, as discussed in **Section 20.2.2.1.1.** Assessment of the impact of the Project on $PM_{2.5}$ levels are detailed in **Section 20.7**. The guidance considered in the assessment is detailed in **Section 20.5.1** and includes Defra's guidance on $PM_{2.5}$ targets (Defra, 2024d).
Paragraph 5.2.11: "Defra publishes future national projections of air quality based on estimates of future levels of emissions, traffic, and vehicle fleet. Projections are updated as the evidence base changes and the applicant should ensure these are current at the point of an application. The applicant's assessment should be consistent with this but may include more detailed modelling and evaluation to demonstrate local and national impacts. If an applicant believes they have robust additional supporting evidence, to the extent they could affect the conclusions of the assessment, they should include this in their representations to the Examining Authority along with the source."	The assessment uses Defra's published air quality data, as presented in **Section 20.5.3**.
Paragraph 5.2.12: "Where a proposed development is likely to lead to a breach of any relevant statutory air quality limits, objectives or targets, or affect the ability of a noncompliant area to achieve compliance within the timescales set out in the most recent relevant air quality plan/strategy at the time of the decision, the applicant should work with the relevant authorities to secure appropriate mitigation measures to ensure that those statutory limits, objectives or targets are not breached."	Assessments of the compliance of the Project against relevant statutory air quality limits, objectives or targets are presented in **Section 20.7**.

NPS Reference and Requirement	How and Where Considered in the PEIR
Paragraph 5.2.13: "The Secretary of State should consider whether mitigation measures are needed both for operational and construction emissions over and above any which may form part of the project application. A construction management plan may help codify mitigation at this stage. In doing so the Secretary of State should have regard to the Air Quality Strategy in England, or the Clean Air Plan for Wales in Wales, or any successors to these and should consider relevant advice within Local Air Quality Management guidance and $PM_{2.5}$ targets guidance." Paragraph 5.2.14: "The mitigations identified in section 5.14 on traffic and transport impacts will help mitigate the effects of air emissions from transport."	Embedded mitigation measures are discussed in **Section 20.4.2** and detailed in the **Outline Code of Construction Practice** (document reference 8.9), a draft version of which is provided with the PEIR and will be updated post-PEIR for the DCO application submission. The assessment determined that there is no requirement for additional mitigation measures, as described in **Section 20.7.4**.
Paragraph 5.7.1: "During the construction, operation and decommissioning of energy infrastructure there is potential for the release of a range of emissions such as odour, dust, steam, smoke, artificial light and infestation of insects. All have the potential to have a detrimental impact on amenity or cause a common law nuisance or statutory nuisance under Part III, Environmental Protection Act 1990. However, they are not regulated by the environmental permitting regime, so mitigation of these impacts will need to be included in the Development Consent Order."	
Paragraph 5.7.5: "The applicant should assess the potential for insect infestation and emissions of odour, dust, steam, smoke, and artificial light to have a detrimental impact on amenity, as part of the ES." Paragraph 5.7.6: "In particular, the assessment provided by the applicant should describe: • the type, quantity and timing of emissions; • aspects of the development which may give rise to emissions; • premises or locations that may be affected by the emissions; • effects of the emission on identified premises or locations; and • measures to be employed in preventing or mitigating the emissions."	**Chapter 19 Ground Conditions and Contamination** highlights the potential for historical landfill within the onshore ECC and OCS zones. It is recommended that the Project seeks to avoid disturbance of historic landfill material. Avoidance of historic landfall has been adopted as a principle during the site selection process leading up to the identification of the Onshore Development Area and will be applied during further site selection refinements at ES stage (see **Chapter 5 Site Selection and Consideration of Alternatives).** If this is not possible, the potential impacts from odour will be considered in the ES. With regards to the impact of dust, the Planning Inspectorate (PINS) agreed to scope out the assessment of dust and particulate matter during operation (PINS, 2024). An assessment of potential impacts associated with construction dust and fine particulate matter is provided in **Section 20.7.1.1**. The impact of dust during decommissioning is considered in **Section 20.7.3**.
Paragraph 5.7.7: "The applicant is advised to consult the relevant local planning authority and, where appropriate, the EA about the scope and methodology of the assessment."	The scope and methodology of the assessment was agreed with East Riding of Yorkshire Council (ERYC) and Hull City Council, as detailed in **Section 20.3**.
Paragraph 5.7.9: "Construction should be undertaken in a way that reduces emissions, for example the use of low emission mobile plant during the construction, and demolition phases as appropriate, and consideration should be given to making these mandatory in Development Consent Order requirements."	An Air Quality Management Plan (AQMP) will be provided as part of the CoCP developed post-consent (see Commitment ID CO55 in **Table 20-7).** The AQMP will be developed in accordance with the Non-Road Mobile Machinery and construction dust mitigation measures recommended in the Outline CoCP.
Paragraph 5.7.10: "Demolition considerations should be embedded into designs at the outset to enable demolition techniques to be adopted that remove the need for explosive demolition."	It is anticipated that there will be no demolition required as part of the construction phase of the Project. Therefore, demolition has been not considered as part of the assessment.
Paragraph 5.7.11: "A construction management plan may help clarify and secure mitigation."	An AQMP will be provided as part of the CoCP developed post-consent in accordance with the Outline CoCP prior to the commencement of the relevant stage of construction works (see Commitment ID CO55 in **Table 20-7**).

Table 20-2 Air Quality Strategy Standards and Objectives (England) for the Purpose of Local Air Quality Management

Pollutant	Air Quality Objective		
	Air Quality Standard		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 ($PM_{2.5}$)	20 (10**)	Annual mean (target)	01/01/2020 (31/12/2040**)
	15% cut in annual mean (urban background exposure) compared with 2016-2018 baseline exposure	Annual mean	2010-2020
	35%** cut in annual mean (urban background exposure) compared with 2016-2018 baseline exposure	Annual mean	31/12/2040

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

** Environmental targets required by Section 1 of the Environment Act were adopted in January 2023 (HMSO, 2023).

20.2.2.1.1 Air Quality Strategy

11. The EU Air Quality Framework Directive 96/62/EC on Ambient Air Quality Assessment and Management entered into force in November 1996 (European Parliament, 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.

12. The 1995 Environment Act (1995) (HMSO, 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 authorities in relation to meeting these standards and objectives (the Local Air Quality Management (LAQM) system).

13. The UK AQS was originally adopted in 1997 (Department of Environment, 1997) and has been reviewed and updated to take account of 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 (Department of the Environment, Transport and the Regions (DETR), 2000). This was subsequently amended in 2003 and was last updated in July 2007 (Defra, 2007).

14. The UK Government published its Clean Air Strategy (CAS) (Defra, 2019) in January 2019, which reset the focus for the first time since the 2007 AQS revision. The CAS identified 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 proposed an ambitious target to reduce the population exposed to concentrations of $PM_{2.5}$ above 10µg.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.

15. The Environment Act 2021 gained royal assent in November 2021 (Defra, 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.

16. The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (HMSO, 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 10µg.m^{-3}, to be met across England by the end of 2040; and
- A Population Exposure Reduction Target – a 35% reduction in population exposure to $PM_{2.5}$ by the end of 2040.

17. A new AQS for England was published in April 2023 (Defra, 2023) to provide a framework for local authorities to achieve the new $PM_{2.5}$ targets.

20.2.2.1.2 Local Air Quality Management

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

19. The current air quality standards and objectives (for the purpose of LAQM) of relevance to this assessment are outlined in **Table 20-2**. Pollutant standards relate to ambient pollutant concentrations in air over a specified averaging period. These are 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.

20. The pollutants of concern in the context of the air quality assessment are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$). These pollutants are most likely to be present in ambient air at concentrations close to or above the air quality standards at sensitive receptors near to roads. Air quality standards and objectives relevant to the air quality assessment are summarised in **Table 20-2**.

21. 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.

20.2.2.1.3 Critical Levels and Loads for the Protection of Vegetation and Ecosystems

22. 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.

23. The Critical Levels of relevance to this assessment relate to concentrations of nitrogen oxides (NO_x) and ammonia (NH_3) and are detailed in **Table 20-3**. 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.

Table 20-3 Critical Levels for the Protection of Vegetation and Ecosystems

Pollutant	Concentration ($\mu g.m^{-3}$)	Measured as*	To be Achieved By
Nitrogen Oxides (NO_x)	30	Annual mean	31/12/2000
Ammonia (NH_3)	3	Annual mean	-
	1 (where lichens and bryophytes are present)	Annual mean	-

24. NO_x Critical Levels are provided as both long and short-term averaging periods. Institute of Air Quality Management (IAQM) guidance on the assessment of air quality impacts on designated nature conservation sites (IAQM, 2020) recommends that only the long-term (annual mean) NO_x Critical Level is used in assessments. This is 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 in the assessment.

25. Critical Loads for habitat sites in the UK are published on the Air Pollution Information System (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 both the Natural England NEA001 (2018) and IAQM (2020) guidance documents.

20.2.2.2 Local

26. The East Riding Local Plan Update 2025 – 2039 (adopted 2025) has been reviewed to identify local policies relevant to the air quality assessment, as described in **Table 20-4**.

27. 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 identified with regard to air quality and health in relation to the Project is summarised in **Table 20-4**.

Table 20-4 Summary of Local Planning Policy on Decision Making Relevant to Air Quality and Dust

Summary of Local Planning Policy	How and Where Considered in the PEIR
East Riding of Yorkshire Council (ERYC)	
East Riding Local Plan Update 2025 – 2039 Policy EC5: Supporting the energy sector: "A. Proposals for the development of the energy sector, excluding mineral extraction, but including all other types of development listed in Table 13, 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, light (including reflection, glint, glare and shadow flicker), and visual impact; […] 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."	The impacts of construction dust at human receptors are presented in **Section 20.7.1**. The impact of construction-generated traffic from the Project was assessed at both human and ecological receptors as presented in **Section 20.7.1.3**. Cumulative effects are considered in **Section 20.8.3**. Decommissioning effects are considered in **Section 20.7.3**.
Hull City Council	
Hull Local Plan 2016 to 2032 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 Project are considered in **Section 20.7**.
Hull Local Plan 2016 to 2032 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 Project are considered in **Section 20.7**. The scope and methodology of the assessment was agreed with Hull City Council through their Scoping Opinion's response and subsequent technical consultation via email on the 21st January 2025 (see **Section 20.3**). A cumulative assessment is discussed in **Section 20.8.3**.

Summary of Local Planning Policy	How and Where Considered in the PEIR
a. worsen air quality within an Air Quality Management Area; [...], or d. have a detrimental impact on local air quality anywhere in the city. [...] 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."	Impacts on receptors within the Air Quality Management Area (AQMA) and the ecological designated sites, which are adjacent to a potential construction traffic route, (including coastal saltmarsh within the Humber Estuary SAC) is considered in **Section 20.7.1.3**.
Hull Local Plan 2016 to 2032 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. 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).	The requirements of the Hull City Council SPD3 and its appendices on environmental quality (Hull City Council, 2019b) are considered within this assessment and discussed in **Section 20.7**.

20.3 Consultation

28. Topic-specific consultation in relation to air quality and dust was undertaken in line with the process set out in **Chapter 7 Consultation**. A Scoping Opinion from the Planning Inspectorate was received on 2nd August 2024, which has informed the scope of the assessment presented within this chapter (as outlined in **Section 20.4.2**).

29. Feedback received through the ongoing Evidence Plan Process (EPP) in relation to Expert Topic Group (ETG) meetings and wider technical consultation meetings with relevant stakeholders has also been considered in the preparation of this chapter. Details of technical consultation undertaken to date on air quality and dust are provided in **Table 20-5**.

Table 20-5 Technical Consultation Undertaken to Date on Air Quality and Dust

Meeting	Stakeholder(s)	Date(s) of Meeting / Frequency	Purpose of Meeting
ETG Meetings			
ETG11 (Air Quality, Noise and Vibration, Socioeconomics, Tourism and Recreation) Meeting 02	ERYC *(Hull City Council invited but not able to attend)*	27/08/2024	• Discuss scoping responses outlined in the 2024 Scoping Opinion on air quality. • Agree the air quality and dust impacts which are scoped into the assessment. • Discuss and agree the approach to assessment and baseline characterisation to inform the PEIR chapter.
Other Technical Consultation			
Email consultation on proposed detailed assessment methodology	Hull City Council and ERYC	Email sent on 09/10/2024. Response received by ERYC on 09/10/2024 and Hull City Council 21/01/2025.	• Agree the proposed assessment methodology for the impacts scoped into the assessment.

30. **Volume 2, Appendix 20.1 Consultation Responses for Air Quality and Dust** summarises how consultation responses received to date are addressed in this chapter.

31. This chapter will be updated based on refinements made to the Project Design Envelope and to consider where appropriate stakeholder feedback on the PEIR. The updated chapter will form part of the ES to be submitted with the DCO application

20.4 Basis of the Assessment

32. The following sections establish the basis of the assessment of likely significant effects, which is defined by the Study Area(s), assessment scope, realistic worst-case scenarios and development scenarios.

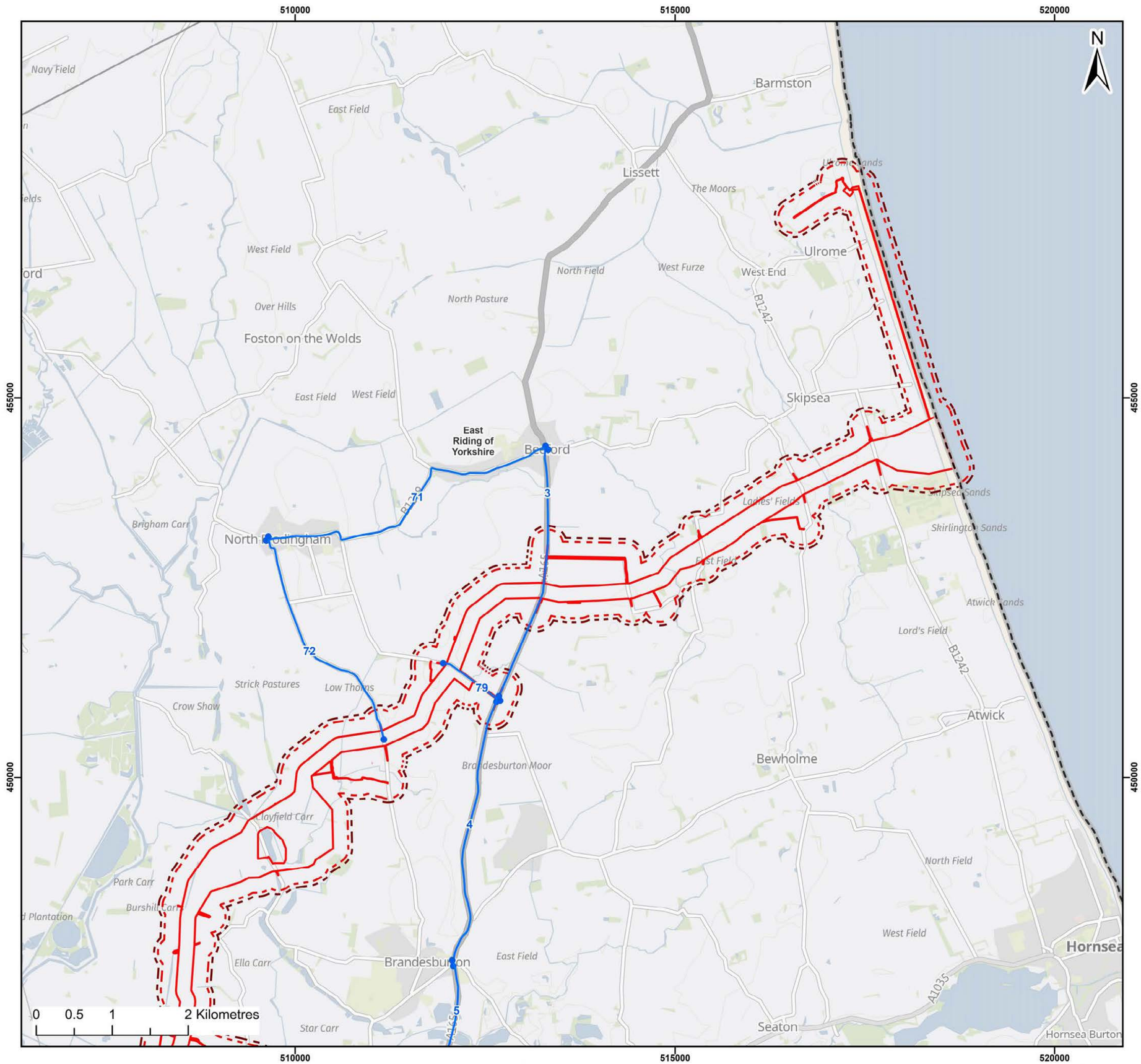
33. This section should be read in conjunction with **Volume 2, Appendix 1.2 Guide to PEIR**, **Volume 2, Appendix 6.2 Impacts Register** and **Volume 2, Appendix 6.3 Commitments Register**.

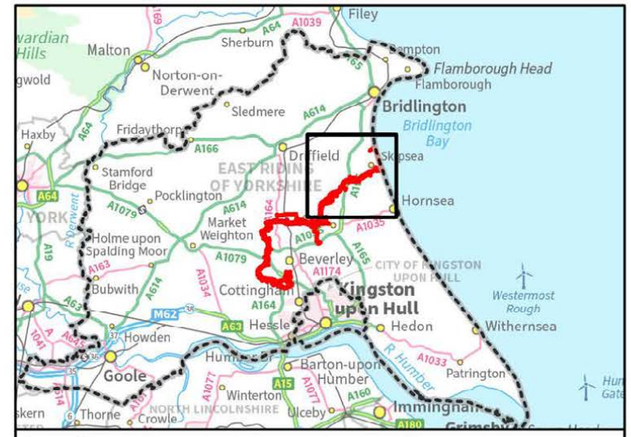
20.4.1 Study Area

34. The Air Quality Study Area has been defined on the basis of the Planning Inspectorate's Scoping Opinion (2024), through technical consultation with ERYC and Hull City Council and using the criteria detailed below:

- Construction dust and fine particulate matter emissions:
  - Human receptors within 250m of the Onshore Development Area and within 50m of routes used by construction vehicles (for routes used by construction-generated traffic up to 250m 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 250m from the Onshore Development Area).
- Construction and operational Non-Road Mobile Machinery (NRMM) emissions:
  - Human and ecological receptors within 200m of the Onshore Development Area where NRMM will be located.
- Construction and operational road vehicle exhaust emissions:
  - Human and ecological receptors within 200m of all roads that trigger the traffic screening criteria and adjoining roads within 200m. Further information on the Project's traffic routes is provided in **Chapter 26 Traffic and Transport**.
- Construction and operational vessel emissions:
  - Professional judgement was used to determine the distance at which impacts on ecological receptors have the potential to be significant, taking into account the duration of activity, prevailing meteorological conditions and the size and type of vessel.

35. The Air Quality Study Area is shown on **Figure 20-1**.





Legend:

- Onshore Development Area
- Local Authority Boundary
- Construction Non-Road Mobile Machinery Emissions Study Area (Onshore Development Area 200m Buffer)
- Construction Dust and Fine Particle Study Area (Onshore Development Area 250m Buffer)
- Modelled Road Links

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Air Quality and Dust Study Area - Sheet 1 of 5

Figure: 20.1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0336

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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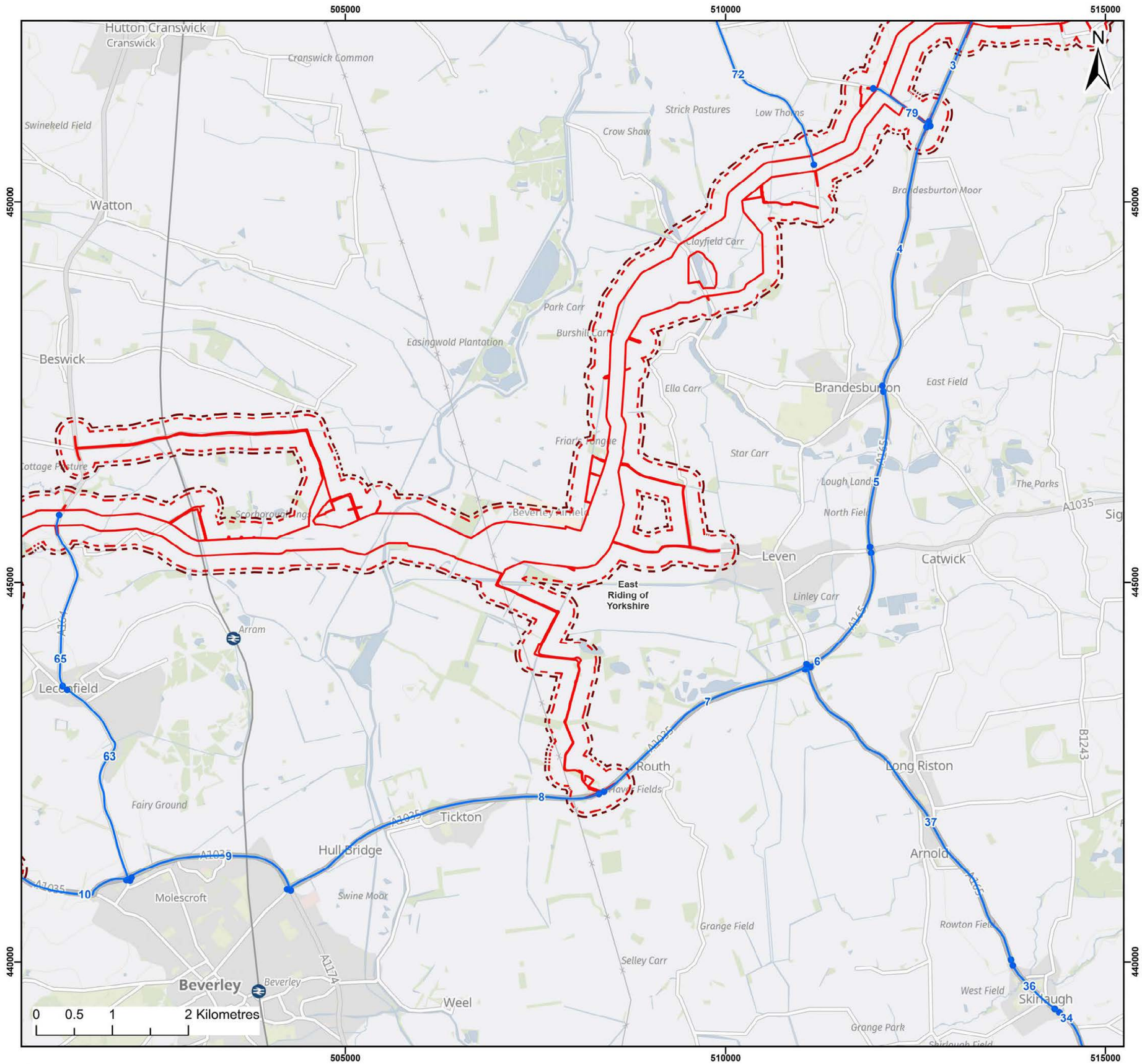

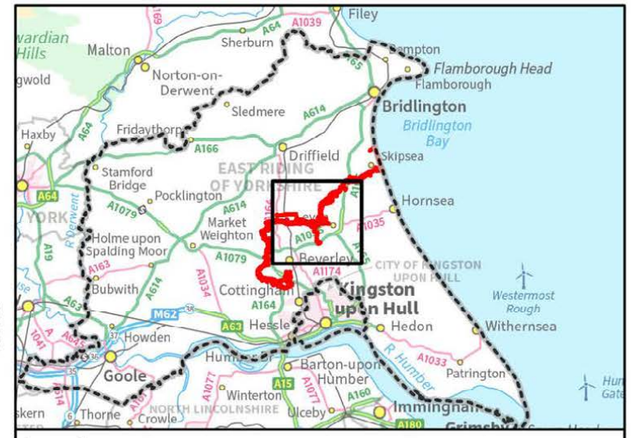

Legend:

- Onshore Development Area
- Local Authority Boundary
- Construction Non-Road Mobile Machinery Emissions Study Area (Onshore Development Area 200m Buffer)
- Construction Dust and Fine Particle Study Area (Onshore Development Area 250m Buffer)
- Modelled Road Links

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Air Quality and Dust Study Area - Sheet 2 of 5

Figure: 20.1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0336

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01	16/12/2024	FC	DH	A3	1:50,000

Co-ordinate system: British National Grid

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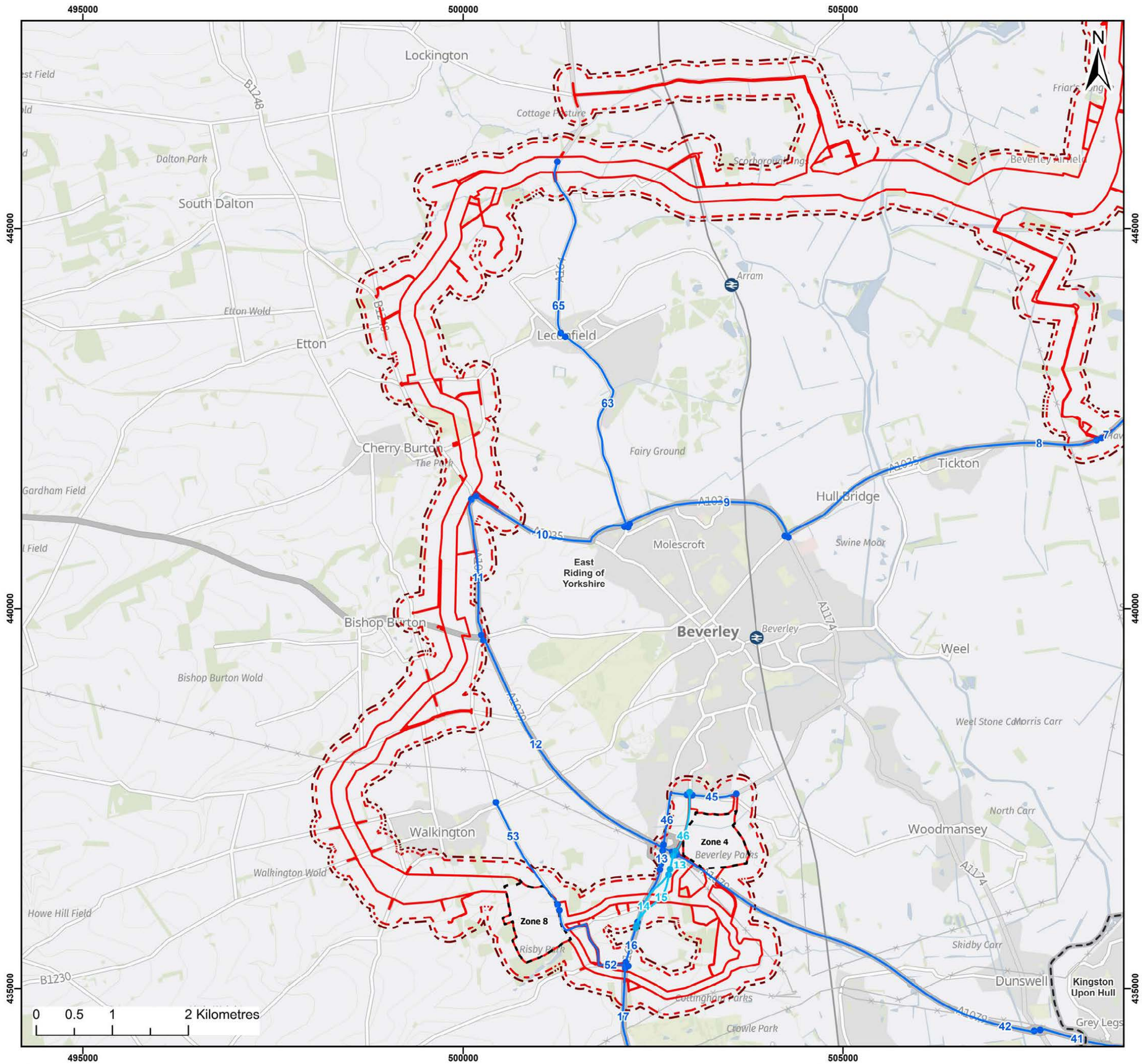

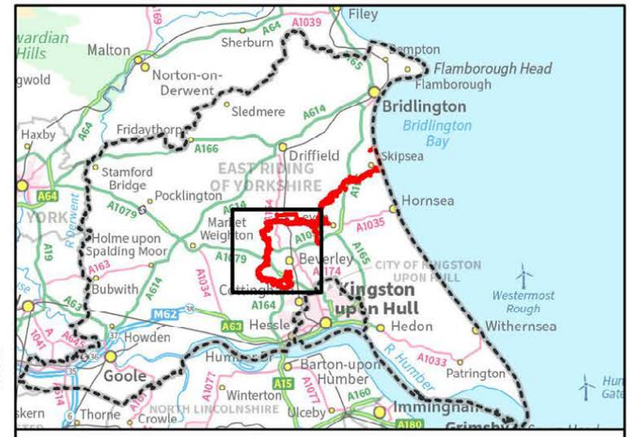

Legend:

- Onshore Development Area
- Onshore Converter Station Zone Options
- Local Authority Boundary
- Construction Non-Road Mobile Machinery Emissions Study Area (Onshore Development Area 200m Buffer)
- Construction Dust and Fine Particle Study Area (Onshore Development Area 250m Buffer)
- Modelled Road Links
- Updated A164 Jocks Lodge Road Network

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Air Quality and Dust Study Area - Sheet 3 of 5

Figure: 20.1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0336

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Co-ordinate system: British National Grid

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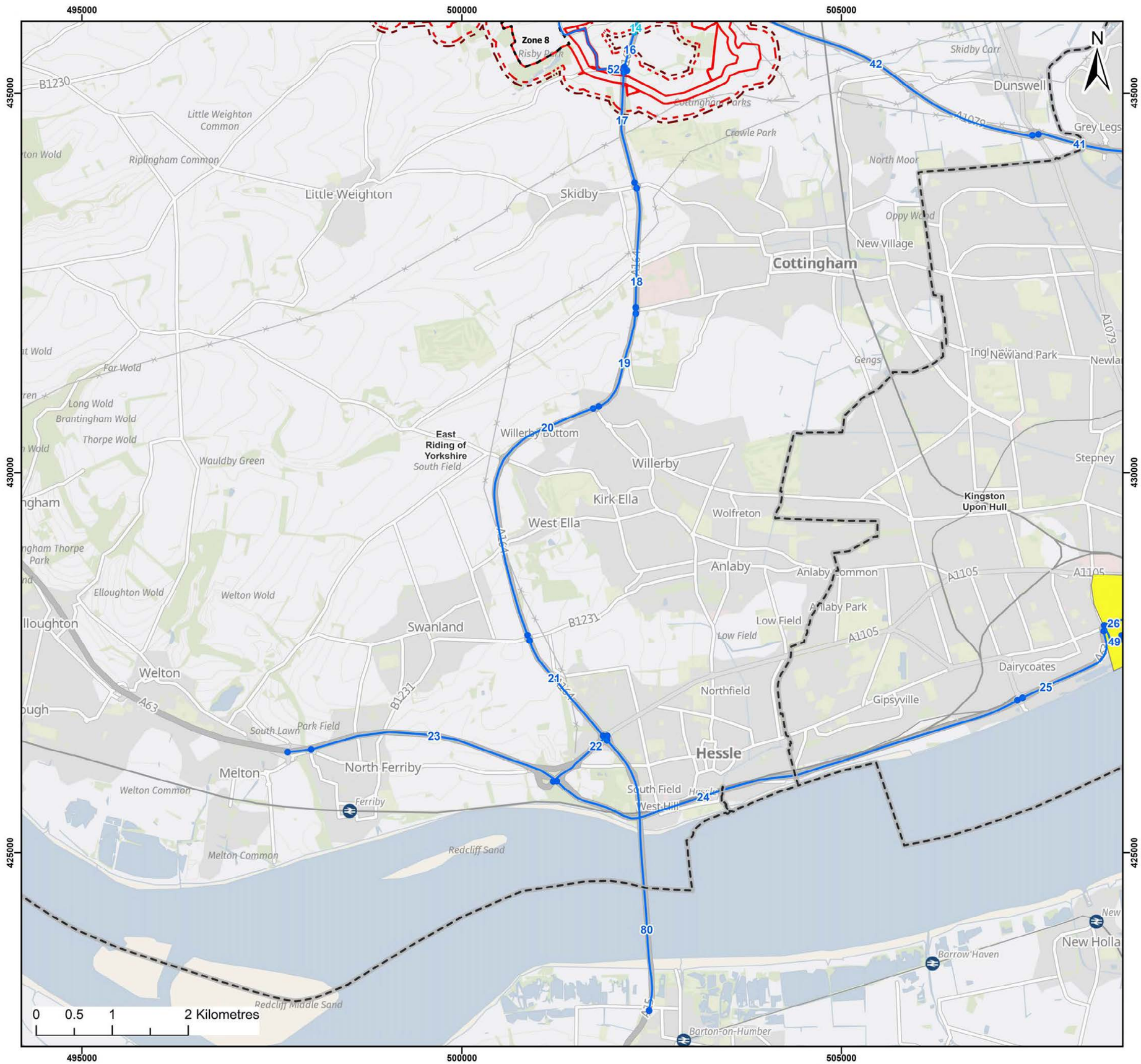

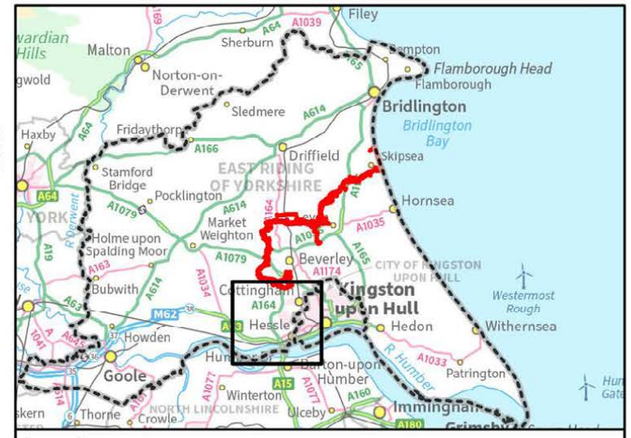

Legend:

- Onshore Development Area
- Onshore Converter Station Zone Options
- Local Authority Boundary
- Construction Non-Road Mobile Machinery Emissions Study Area (Onshore Development Area 200m Buffer)
- Construction Dust and Fine Particle Study Area (Onshore Development Area 250m Buffer)
- Modelled Road Links
- Updated A164 Jocks Lodge Road Network
- Air Quality Management Area (AQMA)

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Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Air Quality and Dust Study Area
- Sheet 4 of 5

Figure: 20.1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0336

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01	16/12/2024	FC	DH	A3	1:50,000

Co-ordinate system: British National Grid

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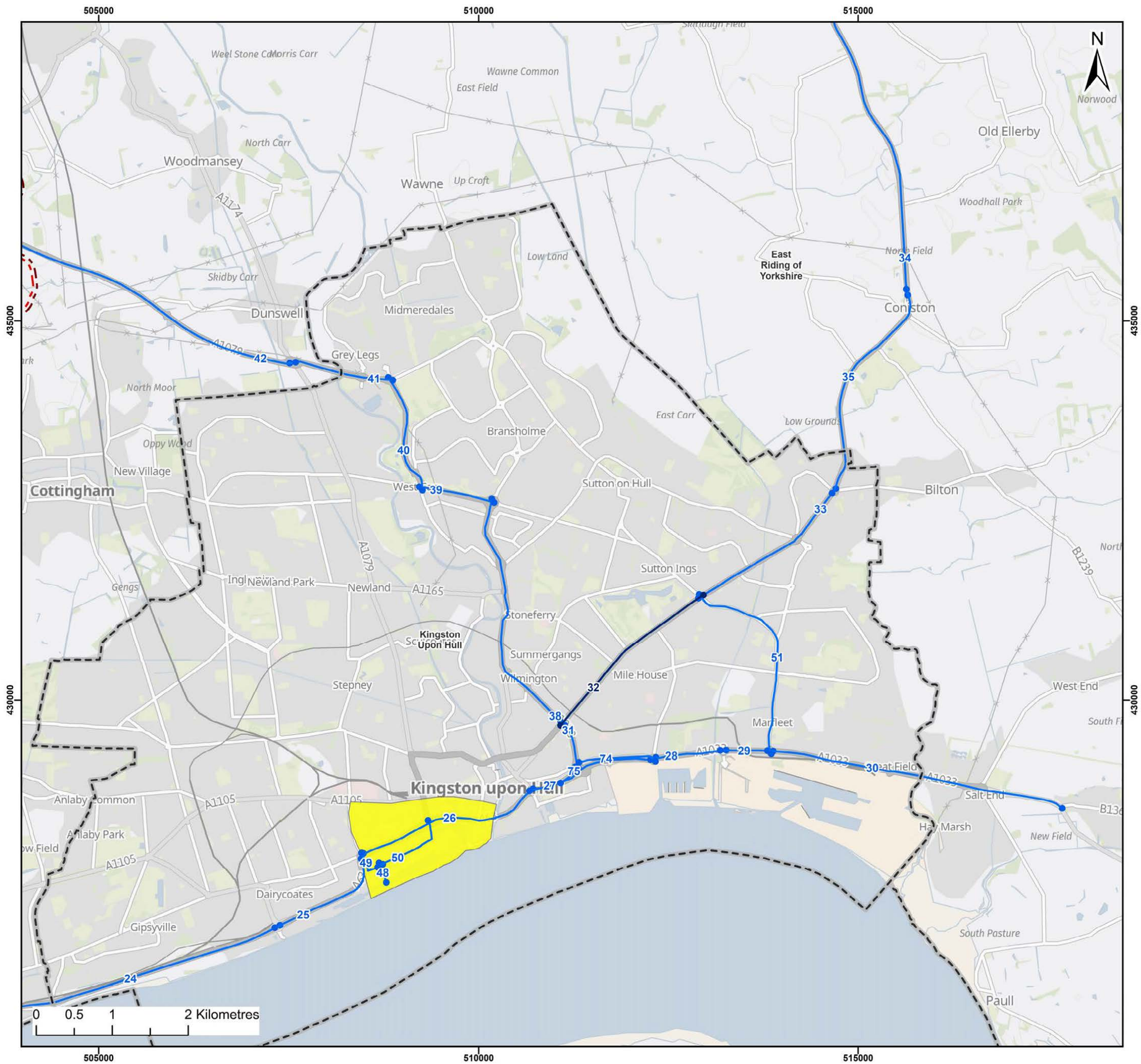

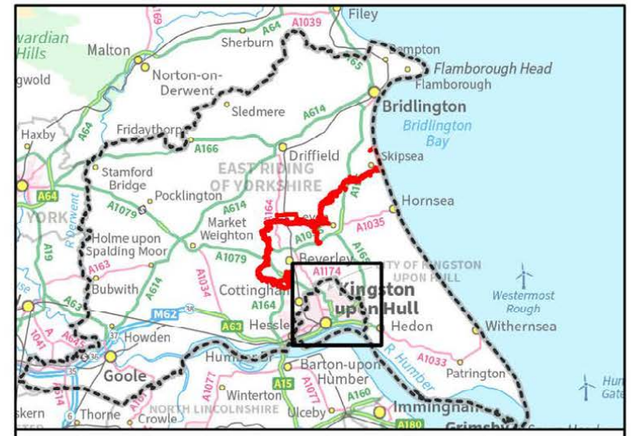

Legend:

- Onshore Development Area
- Local Authority Boundary
- Construction Non-Road Mobile Machinery Emissions Study Area (Onshore Development Area 200m Buffer)
- Construction Dust and Fine Particle Study Area (Onshore Development Area 250m Buffer)
- Modelled Road Links
- Road Modelled for Model Verification
- Air Quality Management Area (AQMA)

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Air Quality and Dust Study Area - Sheet 5 of 5

Figure: 20.1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0336

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01	16/12/2024	FC	DH	A3	1:50,000

Co-ordinate system: British National Grid

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20.4.2 Scope of the Assessment

36. Offshore air quality impact and operational dust and fine particulate matter emissions (AQ-O-01) have been scoped out of the air quality and dust assessment. However, it should be noted that the air quality impacts at onshore receptors from nearshore vessel emissions has been considered in the assessment. This is outlined in **Volume 2, Appendix 6.2 Impacts Register**, along with supporting justification and is in line with the Scoping Opinion (Planning Inspectorate, 2024), discussed in **Section 20.3**, and the project description outlined in **Chapter 4 Project Description**.

37. Impacts scoped into the assessment relating to air quality and dust are outlined in **Table 20-6** and discussed further in **Section 20.7**.

38. A full list of impacts scoped in / out of the air quality and dust assessment is summarised in **Volume 2, Appendix 6.2 Impacts Register**. A description of how the Impacts Register should be used alongside the PEIR chapter is provided in **Volume 2, Appendix 1.2 Guide to PEIR** and **Chapter 6 Environmental Impact Assessment Methodology**.

Table 20-6 Air Quality and Dust – Impacts Scoped into the Assessment

Impact ID	Impact and Project Activity	Rationale
Construction		
AQ-C-01	Construction dust and fine particulate matter emissions – construction activities such as earthworks and trackout	Impacts during construction may occur at human and ecological receptors as a result of the generation of dust and particulate matter during onshore construction works, e.g. from earthworks, stockpiling of stripped soils, establishment and use of temporary construction compounds to support onshore construction activities.
AQ-C-02	Construction NRMM emissions – exhaust emissions from plant and equipment usage during construction activities	Impacts may occur from exhaust emissions from construction NRMM and road vehicle movements. These emissions will add to existing pollutant concentrations at human receptors and pollutant concentrations and deposition levels of pollutants at designated ecological sites.
AQ-C-03	Construction road vehicle exhaust emissions – exhaust emissions from road vehicle movements associated with construction activities	
AQ-C-04	Construction vessel emissions – exhaust emissions from nearshore vessel movements associated with construction activities	The Planning Inspectorate, as indicated in the Scoping Opinion (2024), agreed that offshore air quality impacts may be scoped out of further assessment in the ES for all phases on the basis that the main source of emissions would be exhaust emissions from vessels and onboard temporary generators and, due to the nature and location of the Project, associated vessel movements and temporary generator usage would only generate a small increase in emissions, which is unlikely to result in significant effects on human and ecological receptors. However, Natural England's response in the Scoping Opinion noted that consideration should be given to the potential for air quality impacts due to increased vessel movements during construction. In the PEIR, consideration has been given to impacts from nearshore vessel emissions during construction to onshore ecological receptors to demonstrate the absence of likely significant effects.
Operation and Maintenance		
AQ-O-02	Operational NRMM and backup generator emissions - exhaust emissions from routine and unplanned maintenance activities and backup generators during operation	The Planning Inspectorate, as indicated in the Scoping Opinion (2024), considers that the information in the Scoping Report on the likely emissions to air from plant and machinery during operation and the receptors which could be affected is limited. The Inspectorate also notes that back-up generators have the potential to result in air quality effects during the O&M phase. Accordingly, the Planning Inspectorate does not agree that these matters can be scoped out. The impact from operational NRMM and backup generator emissions has therefore been considered in the PEIR to demonstrate the absence of likely significant effect.
AQ-O-03	Operational road vehicle exhaust emissions - exhaust emissions from road vehicle movements during operation	The Planning Inspectorate, as indicated in the Scoping Opinion (2024) agrees it is unlikely that road traffic associated with O&M activities would result in significant effects in respect of air quality. However, it is stated that the assessment should confirm the anticipated vehicle movements are below the IAQM EPUK (IAQM and EPUK, 2017) screening criteria. The impact from road vehicle exhaust emissions has therefore been considered in the PEIR to demonstrate the absence of likely significant effect.

Impact ID	Impact and Project Activity	Rationale
AQ-O-04	Operational vessel emissions - exhaust emissions from nearshore vessel movements during operation	The Planning Inspectorate, as indicated in the Scoping Opinion (2024), agreed that offshore air quality impacts may be scoped out of further assessment in the ES for all phases on the basis that the main source of emissions would be exhaust emissions from vessels, onboard temporary generators and, due to the nature and location of the Project, associated vessel movements and temporary generator usage would only generate a small increase in emissions, which is unlikely to result in significant effects on human and ecological receptors. However, Natural England's response in the Scoping Opinion noted that consideration should be given to the potential for air quality impacts due to increased vessel movements during operation. In the PEIR, consideration has been given to impacts from nearshore vessel emissions during operation to onshore ecological receptors to demonstrate the absence of likely significant effects.
Decommissioning		
AQ-D-01	Decommissioning dust and fine particulate matter emissions – decommissioning activities not yet defined	Decommissioning impacts are scoped in; however, details of onshore decommissioning activities are not known at this stage. As discussed in **Section 20.7.3**, decommissioning impacts will be assessed in detail through the Onshore Decommissioning Plan (see **Table 20-7**, Commitment ID CO56) where relevant, which will be developed prior to the commencement of onshore decommissioning works. In this assessment, it is assumed that most decommissioning activities would be the reverse of their construction counterparts, and that their impacts would be of similar nature to, and no worse than, those identified during the construction phase.
AQ-D-02	Decommissioning NRMM emissions – decommissioning activities not yet defined	
AQ-D-03	Decommissioning road vehicle exhaust emissions – decommissioning activities not yet defined	

20.4.3 Embedded Mitigation Measures

39. The Project has made several commitments to avoid, prevent, reduce or, if possible, offset potential adverse environmental effects through mitigation measures embedded into the evolution of the Project Design Envelope. These embedded mitigation measures include actions that will be undertaken to meet other existing legislative requirements and those considered to be standard or best practice to manage commonly occurring environmental effects.

40. The assessment of likely significant effects has therefore been undertaken on the assumption that these measures are adopted during the construction, O&M and decommissioning phases. **Table 20-7** identifies proposed embedded mitigation measures that are relevant to the air quality and dust assessment.

41. Full details of all commitments made by the Project are provided within the Commitments Register in **Volume 2, Appendix 6.3 Commitments Register**. A description of how the Commitments Register should be used alongside the PEIR chapter is provided in **Volume 2, Appendix 1.2 Guide to PEIR** and **Chapter 6 Environmental Impact Assessment Methodology**. In addition, a list of draft outline management plans which are submitted with the PEIR for consultation is provided in **Section 1.10 of Chapter 1 Introduction**. These documents will be further refined and submitted along with the DCO application. **See Volume 2, Appendix 1.2 Guide to PEIR** for a list of all PEIR documents.

42. The Commitments Register is provided at PEIR stage to provide stakeholders with an early opportunity to review and comment on the proposed commitments. Proposed commitments may evolve during the pre-application phase as the EIA progresses and in response to refinements to the Project Design Envelope and stakeholder feedback. The final commitments will be confirmed in the Commitments Register submitted along with the DCO application.

Table 20-7 Embedded Mitigation Measures Relevant to Air Quality and Dust

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Air Quality and Dust Assessment	Relevance to Impact ID
CO25	A Project Environmental Management Plan (PEMP) will be provided in accordance with the Outline PEMP and will include: • A Marine Pollution Contingency Plan (MPCP), which will include plans to address the risks, methods and procedures to deal with any spills and collision incidents in relation to all activities carried out below Mean High Water Springs (MHWS) to safeguard the marine environment; • Best practice measures for the storage, use and disposal of lubricant and chemicals will be undertaken throughout the construction phase; • A Chemical Risk Assessment (CRA) to ensure any chemicals, substances and materials to be used will be suitable for use in the marine environment and in accordance with the Health and Safety Executive and the Environment Agency Pollution Prevention Control Guidelines or latest relevant available guidelines; • A marine biosecurity plan detailing how the risk of introduction and spread of invasive non-native species will be minimised; and • Details of waste management and disposal arrangements.	DML Condition – Project Environmental Management Plan	Limits the effect of vessel exhaust emissions at nearshore receptors due to compliance with existing and emerging vessel fuel standard regulations.	AQ-C-04 AQ-O-04
CO39	A Code of Construction Practice (CoCP) will be provided in accordance with the Outline CoCP. The CoCP will enable effective planning, monitoring and management of onshore construction works to mitigate potential impacts on the environment and communities and ensure compliance with the latest relevant regulatory requirements and best practice.	DCO Requirement - Code of Construction Practice	Limits the effect of construction dust, NRMM and vehicle exhaust emissions at nearby receptors.	AQ-C-01 AQ-C-02 AQ-C-03
CO55	An Air Quality Management Plan (AQMP) will be provided as part of the Code of Construction Practice (CoCP). The AQMP will be developed in accordance with the Outline CoCP and will be in line with the latest relevant available Institute of Air Quality Management (IAQM) guidance and, where appropriate and practicable and will set out site-specific mitigation and monitoring measures for dust and other air emissions during the construction works.	DCO Requirement - Code of Construction Practice		
CO56	An Onshore Decommissioning Plan will be developed prior to commencement of onshore decommissioning works based on the relevant available guidance and legislative requirements. The scope and methodology of onshore decommissioning works and appropriate mitigation measures will be detailed in the plan.	DCO Requirement - Onshore Decommissioning Plan	Ensures that air quality and dust emissions from decommissioning activities will be minimised in accordance with relevant available guidance and legislative requirements at the time.	AQ-D-01 AQ-D-02 AQ-D-03
CO69	Core working hours for onshore construction activities will be 07:00 to 19:00 Monday to Saturday. Outside of these hours, including Sunday and bank holidays, no construction activities will be undertaken apart from in the following circumstances: • Where extended and continuous periods (up to 24 hours a day, seven days a week) of working are required such as trenchless installation works, concrete pouring and cable pull-in and jointing operations;	DCO Requirement - Onshore Construction Hours	Limits the effect of construction NRMM and vehicle exhaust emissions at nearby receptors.	AQ-C-01 AQ-C-02

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Air Quality and Dust Assessment	Relevance to Impact ID
	• Deliveries of abnormal indivisible loads that may otherwise cause congestions on the public highway network; • Testing and commissioning of installed onshore electrical infrastructure; • Daily start-ups and shut-downs, limited to site inspections, housekeeping, briefings, toolbox talks and safety checks; • Emergency works; and • Works as otherwise agreed in writing with the relevant local authority. Vehicle movements on the public highway network and employees' arrival and departure to/from site may occur outside of the core working hours.			
CO73	A Construction Traffic Management Plan (CTMP) will be developed in accordance with the Outline CTMP. The CTMP will include: • Measures to control, monitor and enforce the numbers and routeing of Heavy Goods Vehicle (HGV) movement during construction and include localised road improvements that are necessary to ensure the safe passage of HGV traffic via the public highway network; • Details on the location and design of construction and operational accesses, such as the frontage, general layout and visibility; • Detail on how construction employee traffic will be managed and measures to encourage sustainable alternative modes of travel including but not limited to single occupancy car trips during construction; • Measures to manage peak construction traffic flows and reduce the associated construction traffic noise and vehicle emissions; • Measures to ensure early and ongoing information provision to road users and emergency and healthcare services with regard to any temporary road or lane closures and diversions; and • Details on any site-specific additional mitigation measures required to avoid significant effects identified due to construction traffic.	DCO Requirement - Construction Traffic Management Plan	Limits the effect of construction vehicle exhaust emissions at nearby receptors.	AQ-C-03
CO75	Routeing of construction Heavy Goods Vehicles (HGV) and employee traffic will be directed to and managed at temporary construction compounds where possible to reduce vehicle movements on the public highway network. Onwards travel to the works site will be via the installed temporary haul roads to reduce the number of access points required and construction vehicle movements along the public highway network.	DCO Requirement - Construction Traffic Management Plan		
CO76	Temporary construction compounds will utilise the most suitable roads as access points and be located close to main A roads and away from population centres where practicable to minimise impacts on local communities.	DCO Requirement - Construction Traffic Management Plan DCO Requirement - Code of Construction Practice	Limits the effect of construction dust and NRMM emissions at nearby receptors.	AQ-C-01 AQ-C-02

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Air Quality and Dust Assessment	Relevance to Impact ID
CO80	A Communications Plan will be provided as part of the Code of Construction Practice (CoCP). The Communications Plan will be developed in accordance with the Outline CoCP and will outline how the relevant stakeholders, such as local authorities, residents, businesses and emergency services, will be notified in advance of construction works and kept informed during construction. The Communications Plan will also include measures to ensure effective and open communication and set out appropriate grievance mechanisms.	DCO Requirement - Code of Construction Practice	Ensures that nearby residents will be kept informed of the works, what is being done to minimise emissions to air during construction and how they can raise complaints.	AQ-C-01 AQ-C-02 AQ-C-03
CO102	A Port Access Management Plan(s) (PAMP) will be developed once the preferred offshore construction base port(s) and O&M base port for the Project have been confirmed and agreed with the relevant authorities prior to commencement of construction and operation respectively. The PAMP will be developed if the traffic generated for the construction and operation of the selected base port is outwith the existing baseline of traffic movements at the existing port facility or existing permitted developments should a new facility or extension be required. The PAMP will provide an assessment of the traffic movements due to the port(s) operations for offshore construction and O&M activities and the associated noise and air quality effects, and if required, detail mitigation measures to avoid significant effects.	DCO Requirement - Port Access Management Plan	The PAMP would assess the potential air quality effects as a result of additional traffic movements associated with an offshore construction base port(s) / O&M base port.	AQ-C-03 AQ-O-03

43. A draft version of the **Outline Code of Construction Practice** (document reference 8.9) is provided with the PEIR for consultation, which will be further refined and submitted with the DCO application. The Outline CoCP includes measures relevant to air quality and dust, which will be incorporated into an AQMP developed post-consent as part of the CoCP. Indicative embedded mitigation measures relevant to air quality and dust which are included in the Outline CoCP are set out in **Table 20-8**.

Table 20-8 Indicative Embedded Mitigation Measures Included in the Outline Code of Construction Practice

Outline CoCP: Embedded Mitigation Measures for Air Quality and Dust

Air Quality Management Plan (AQMP) (to be developed post-consent)

An AQMP for the specific stage of construction works will be included in the CoCP. The AQMP will be developed in accordance with the IAQM's *Guidance on the Assessment of Dust from Demolition and Construction* (2024) or the latest available guidance. The AQMP will set out site-specific mitigation and monitoring measures for dust and non-road mobile machinery (NRMM) emissions, as detailed in the sections below.

Construction Dust Emissions

During construction, the following mitigation measures will be implemented as recommended by the IAQM's Guidance on the Assessment of Dust from Demolition and Construction (2024) for high-risk sites to control dust and particulate matter emissions to suitable levels:

- Communications:
  - Develop and implement a Communications Plan that includes community engagement prior to the commencement of works on site;
  - Display key contact details for person(s) accountable for air quality and dust issues on the construction site boundary; and
  - Display the contact details for the head or regional office of the Principal Contractor(s) on the construction site boundary.
- Site Management:
  - Record all air quality and dust complaints, identify cause(s), take appropriate remedial measures to reduce emissions in a timely manner and record the measures taken;
  - Make the complaints log available to ERYC if requested;
  - Record any exceptional incidents that cause dust and / or air emissions from the Project's construction activities, either on-site or off-site and ensure prompt remedial action is taken to resolve the situation; and
  - Hold regular liaison meetings with other high risk (as defined by IAQM, 2024) construction sites within 500m of the construction site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. Considerations should be given to cumulative interactions with respect to off-site transport / deliveries using the same strategic road network routes should be considered where relevant.

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- Monitoring:
  - Undertake daily on-site and off-site visual dust inspections, in line with relevant guidance, where receptors (including roads) are nearby, to monitor compliance with the AQMP and dust levels and record the observations in a log which shall be made available to ERYC if requested. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary, with cleaning to be provided if necessary;
  - Increase the frequency of site inspections during activities with a high potential to produce dust and during prolonged dry or windy conditions; and
  - Agree dust deposition monitoring locations with EYRC prior to the commencement of the relevant construction works. Where required and practicable, commence baseline monitoring at least three months before the relevant works commence on site.
- Preparing and Maintaining the Site:
  - Design the construction site layout so that plant and equipment and dust-generating activities are located as far away from sensitive receptors as practicable;
  - Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any soil stockpiles on site;
  - Cover, seed or fence soil stockpiles to prevent wind whipping;
  - Fully enclose the site or specific activities where there is a high potential for dust creation and the site / activity is active for an extensive period;
  - Avoid site run-off of water or mud;
  - Keep site fencing, barriers and scaffolding clean; and
  - Remove materials that have a potential to produce dust from site as soon as practicable, unless the materials are to be re-used on site. If they are being re-used, provide appropriate covering.
- Operating Vehicles / Plant and Equipment and Sustainable Travel:
  - Ensure all vehicles switch off engines when stationary – no idling vehicles;
  - Avoid the use of diesel- or petrol-powered generators and use mains electricity supply or battery-powered equipment where practicable;
  - Produce a construction logistic plan or equivalent (see **Outline Construction Traffic Management Plan** (document reference 8.15) to manage the sustainable delivery of goods and materials;
  - Support and encourage sustainable travel (see **Outline Construction Traffic Management Plan** (document reference 8.15); and
  - Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- General Works at the Site:
  - Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction (e.g. suitable local exhaust ventilation systems);

Outline CoCP: Embedded Mitigation Measures for Air Quality and Dust

- Ensure an adequate water supply is provided on site for effective dust / particulate matter suppression / mitigation, using non-potable water where practicable and appropriate;
- Use enclosed chutes and conveyors and covered skips, where appropriate;
- Minimise drop heights from loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate;
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods; and
- Avoid bonfires and burning of materials and waste materials.

- Measures Specific to Earthworks:
  - Re-vegetate or cover exposed areas of earthworks / soil stockpiles to stabilise surfaces as soon as practicable;
  - Use hessian, mulches, or tackifiers where it is not practicable to re-vegetate or cover with topsoil as soon as practicable; and
  - Only remove the cover in small areas during earthworks and not all at once.
- Measures Specific to Construction:
  - Avoid scabbling (roughening of concrete surfaces) if possible;
  - Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place; and
  - Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- Measures Specific to Trackout:
  - Use water-assisted dust sweeper(s) on the construction accesses and surrounding roads, to remove, as necessary, any material tracked out of the site. This may require regular use of the sweeper(s) and consider the following measures;
  - Avoid dry sweeping of large areas;
  - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;
  - Inspect on-site haul roads for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
  - Record all inspections of haul roads and any remedial action;
  - Install hard surfaced haul roads, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;
  - Implement a wheel washing system with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable;
  - Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and

Outline CoCP: Embedded Mitigation Measures for Air Quality and Dust

- Access gates to be located at least 10m from receptors where practicable.

Non-Road Mobile Machinery Emissions

During construction, the following mitigation measures will be implemented as relevant to control NRMM emissions to suitable levels:

- All NRMM should be well-maintained. If any emissions of dark smoke occur, then the relevant plant / equipment should cease works immediately, and any problem should be rectified through maintenance or replacement;
- 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;
- Where practicable, NRMM would be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load / duty cycle permitting);
- Fuel conservation measures should be implemented, including instructions to:
  - Throttle down or switch off idle construction equipment;
  - Switch off the engines of vehicles while they are waiting to access the site and while they are being loaded or unloaded;
  - Ensure plant / equipment is properly maintained to ensure efficient fuel consumption; and
- Consideration should also be given to the siting of NRMM within the working area. Where practicable, locating generators and other plant / equipment at the greatest distance from sensitive receptors.

20.4.4 Realistic Worst-Case Scenarios

44. To provide a precautionary, but robust, assessment at this stage of the Project's development process, a realistic worst-case scenario has been defined in **Table 20-9** for each impact scoped into the assessment (as outlined in **Section 20.4.2**). The realistic worst-case scenarios are derived from the range of parameters included in the Project Design Envelope. They ensure that the assessment of likely significant effects is based on the maximum potential impact on the environment. Should an alternative development scenario be taken forward in the final design of the Project, the resulting effects would not be greater in effect significance. Further details on the Project Design Envelope are provided in **Chapter 6 Environmental Impact Assessment Methodology**.

45. The realistic worst-case scenarios used to assess impacts on air quality and dust are defined in **Table 20-9**. Following the PEIR publication, further design refinements will be made based on ongoing engineering studies and considerations of the EIA and stakeholder feedback. Therefore, realistic worst-case scenarios presented in the PEIR may be updated in the ES. The Project Design Envelope will be refined where possible to retain design flexibility only where it is needed.

Table 20-9 Realistic Worst-Case Scenarios for Impacts on Air Quality and Dust

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale
Construction			
AQ-C-01	Construction dust and fine particulate matter emissions – construction activities such as earthworks and trackout	**Landfall** • Maximum horizontal length of trenchless installation: 2,000m • Maximum number of landfall cable ducts: 3 (including one spare) • Maximum number of transition joint bay (TJB) at landfall: 1 • Maximum number of underground link box at landfall: 1 • Maximum number of landfall construction compound: 1 • Indicative temporary landfall construction compound area: 12,500m^2 (including footprint of TJB and underground link box) • Indicative haul road width at landfall: 7m • Anticipated duration of landfall construction works: approximately three years (including one year of trenchless installation works) **Onshore ECC** • Indicative temporary construction corridor width for HVDC onshore export cables: 32m (50m at trenchless crossing locations) • Indicative temporary construction corridor width for HVAC onshore export cables: 55m (60m at trenchless crossing locations) • Indicative haul road width within temporary construction corridor: 6m (8.5m where passing places are required) • Maximum length of HVDC export cable corridor: 50km • Maximum length of HVAC export cable corridor: 5km • Target minimum cable burial depth using open cut trenching: 1.2m • Target maximum cable burial depth using trenchless installation techniques: 20m • Maximum land area temporarily disturbed during construction: 1,700,000m^2 • Indicative number of jointing bay locations along onshore ECC: 62 • Indicative number of link box locations along onshore ECC: 56 • Maximum jointing bay and link box temporary construction area for HVDC export cables: 660m^2 (per location) • Maximum jointing bay and link box temporary construction area for HVAC export cables: 1,040m^2 (per location) • Indicative number of main construction compounds for onshore export cable works: 4 • Indicative number of intermediate construction compounds for onshore export cable works: 8 • Indicative number of trenchless crossing locations: 70	The assessment of construction dust risk is informed by the quantity of earthworks and construction activities, and the peak daily number of trackout movements which can lead to emissions of dust to air. The assessment has been based on an indicative construction methodology and programme provided by the Applicant based on available design information. This has been used to quantify the magnitude of potential dust emissions potential construction activities.
AQ-C-02	Construction NRMM emissions – exhaust emissions from plant and equipment usage during construction activities		The significance of effect from NRMM emissions depends on the proposed construction activities and duration of exposure. Consideration is given to both the spatial impacts (proximity to receptors) and temporal (duration) aspect of each the main construction activities. The assessment focuses upon areas where intensive construction activities (such as trenchless crossings) take place. This is in order to assess the worst-case impacts from NRMM emissions and identify the appropriate level of mitigation for worst-case impacts, which will be applied to all onshore construction activities. The assessment has therefore been based on an indicative construction methodology and programme provided by the Applicant.

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale
		• Indicative main construction compound area: 20,000m^2 (per compound) • Indicative intermediate construction compound area: 5,625m^2 (per compound) • Indicative trenchless installation compound area for HVDC export cables: 300m^2 (5,625m^2 for non-HDD techniques) (per compound) • Indicative trenchless installation compound dimensions for HVAC export cables: 800m^2 (5,625m^2 for non-HDD techniques) (per compound) • Trenchless installation techniques under consideration include HDD, auger boring, micro-tunnelling, pipe jacking / ramming and Direct Pipe • Anticipated duration of onshore export cable construction works: approximately four years. **OCS Zone (OCS and ESBI)** • Indicative access road width (including site access road from the public highway and internal tracks within the site): 7.3m • Maximum developable area for OCS and ESBI: 25ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement) • Total permanent area: 20.5ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement) • Total temporary area: 4.5ha (including 2 temporary construction compounds for the OCS and ESBI) • Indicative quantity of topsoil excavated during combined construction works: 100,000m^3 • Indicative quantity of topsoil removed off-site during combined construction works: 50,000m^3 • Anticipated duration of OCS and ESBI construction works: approximately five years.	
AQ-C-03	Construction road vehicle exhaust emissions – exhaust emissions from road vehicle movements associated with construction activities	Earliest onshore construction start year is 2029. The realistic worst-case scenario upon which these flows have been derived is set out in **Chapter 26 Traffic and Transport** and presented in **Volume 2, Appendix 20.3 Construction Road Vehicle Exhaust Emissions Assessment – Traffic Data**.	The impact of construction road vehicle exhaust emissions is dependent on the change in Project's traffic flows. The baseline data are provided based on the first year of construction (assumed to be 2029 at the earliest). This is anticipated to be the peak year for construction traffic. In addition, pollutant emission rates and background concentrations will be higher than in later years of construction.
AQ-C-04	Construction vessel emissions – exhaust emissions from nearshore vessel movements associated with construction activities	**Landfall** • Vessels will be used during the installation of landfall infrastructure (i.e. pull-in of offshore export cables through to the TJB located onshore). • Maximum number of landfall installation vessels: 8. • It is assumed that a mixture of small to medium sized vessels (e.g. multi-cats, jack-up vessels and moored barges) will operate within 400m to 600m of the landfall at the exit pits. Vessels will be present on-site two to four weeks at a time. • It is assumed that larger vessels (e.g. cable lay vessels) would not come closer than 400m of the landfall due to draught clearance.	The impact of emissions from landfall installation vessels on nearshore receptors is dependent on the total number of vessel movements. The assessment has been based on the indicative landfall construction methodology provided by the Applicant. The specific details of vessel movements to the port for onshore construction activities is not known at this stage. As discussed in **Section 20.7.1.4**, the impact of nearshore vessel emissions on ecological receptors are not assessed in detail, but evidence to demonstrate the absence of likely significant effect has been provided.

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale
		Vessels for onshore construction • It is assumed that vessels will travel to a port in the Humber to deliver construction materials to support onshore construction activities (see **Chapter 26 Traffic and Transport** for further details). • The number and type of vessels required and duration at berth are not known at this stage, as this will be determined by logistics partners following procurement and detailed design decisions post-consent. However, these vessel movements are unlikely to be new trips generated by the Project alone but rather part of the existing baseline of shipping traffic into the Humber. **Vessels for offshore construction** • At this stage, no decision has been made regarding which port(s) would be used for the Project's offshore construction. A decision upon the offshore construction base port(s) would not be made until post DCO determination.	
Operation and Maintenance			
AQ-O-02	Operational NRMM and backup generator emissions - exhaust emissions from routine and unplanned maintenance activities and backup generators during operation	**NRMM:** • NRMM emissions during operation will only be generated infrequently during routine and unplanned maintenance activities. • As discussed in **Section 20.7.2.1.1**, the impact of operational NRMM emissions is not assessed in detail, but evidence to demonstrate the absence of likely significant effect has been provided. **Backup Generators:** • The number, size and specific location of backup generators are not confirmed at this stage and will be determined following detailed design post-consent. It is currently assumed that at least one 965 kW diesel-powered emergency backup generator will be required within the OCS zone. The emergency backup generator(s) would be in operation for a maximum of one hour per month for testing and up to 72 hours continuously under emergency usage. • As discussed in **Section 20.7.2.1.2**, the impact of operational emergency backup generator emissions is not assessed in detail, but evidence to demonstrate the absence of likely significant effect has been provided.	
AQ-O-03	Operational road vehicle exhaust emissions - exhaust emissions from road vehicle movements during operation	The OCS and ESBI will be unmanned with personnel visits occurring during routine and unplanned inspection and maintenance activities only. Hence, operational traffic will only be generated infrequently. As discussed in **Section 20.7.2.2**, this impact is not assessed in detail, but evidence to demonstrate the absence of likely significant effect has been provided. The assumed number of operational vehicle movements generated by the Project has been screened against the IAQM and EPUK screening criteria (IAQM and EPUK, 2017). Assumptions on operational traffic movements are provided in **Chapter 26 Traffic and Transport**.	
AQ-O-04	Operational vessel emissions - exhaust emissions from nearshore vessel movements during operation	The impact of nearshore operational vessel emissions on ecological receptors are not assessed in detail, but evidence to demonstrate the absence of likely significant effect has been provided.	

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale
Decommissioning			
AQ-D-01	Decommissioning dust and fine particulate matter emissions – decommissioning activities not yet defined	The final decommissioning strategy of the Project's onshore infrastructure has not yet been decided. For a description of potential onshore decommissioning works, refer to **Chapter 4 Project Description**. It is recognised that regulatory requirements and industry best practice change over time. Therefore, the details and scope of onshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning. Specific arrangements will be detailed in an Onshore Decommissioning Plan (see **Table 20-7**, Commitment ID CO56), which will be submitted and agreed with the relevant authorities prior to the commencement of onshore decommissioning works. For this assessment, it is assumed that decommissioning is likely to operate within the parameters identified for construction (i.e. any activities are likely to occur within the temporary construction working areas and require no greater amount or duration of activity than assessed for construction). The decommissioning sequence will generally be the reverse of the construction sequence. It is therefore assumed that decommissioning impacts would likely be of similar nature to, and no worse than, those identified during the construction phase.	
AQ-D-02	Decommissioning NRMM emissions – decommissioning activities not yet defined		
AQ-D-03	Decommissioning road vehicle exhaust emissions – decommissioning activities not yet defined		

20.4.5 Development Scenarios

46. Consideration is also given to the different development scenarios with respect to the OCS zones. At this stage, two OCS zone options remain in the Project Design Envelope (see **Chapter 4 Project Description** for further details) noting that only one option will be developed. The two development scenarios are:

- Infrastructure located in OCS Zone 4; or
- Infrastructure located in OCS Zone 8.

47. With respect to the air quality and dust assessment, there is potential for the assessment of likely significant effects for the OCS zone infrastructure to differ between the two development scenarios. Where relevant, the assessment outcomes presented in **Section 20.7** are reported separately.

20.5 Assessment Methodology

20.5.1 Guidance Documents

48. The following guidance documents have been used to inform the baseline characterisation, assessment methodology and mitigation design for air quality and dust:

- Hull City Council SPD Appendix E of SPD3: Air Quality Guidance for Planners and Developers (Hull City Council, 2018);
- LAQM Technical Guidance TG (22) August 2022 (Defra, 2022b);
- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (IAQM, 2020);
- Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024);
- Natural England's Approach to Advising Competent Authorities on The Assessment of Road Traffic Emissions Under the Habitats Regulations NEA001 (Natural England, 2018); and
- Land-Use Planning & Development Control: Planning for Air Quality (IAQM and EPUK, 2017).

49. As discussed in **Section 20.2.2.1.1**, the Environmental Targets (Fine Particulate Matter) (England) Regulation 2023 set two new targets for fine particulate matter ($PM_{2.5}$). Defra is developing guidance for applicants and local authorities in England to demonstrate that they have appropriately considered the $PM_{2.5}$ targets when making planning applications and planning decisions (Defra, 2024d). Pending publication of the new guidance, applicants are advised to provide evidence in their planning applications that they have:

- Identified key sources of air pollution within their schemes; and
- Taken appropriate action to minimise emissions of $PM_{2.5}$ and its precursors as far as is reasonably practicable.

20.5.2 Data and Information Sources

20.5.2.1 Desk Study

50. A desk study has been undertaken to compile baseline information in the previously defined Study Area(s) (see **Section 20.4.1**) using the sources of information set out in **Table 20-10**.

Table 20-10 Desk-Based Sources for Air Quality and Dust Data

Data Source	Spatial Coverage	Year(s)	Summary of Data Contents
ERYC Air Quality Annual Status Report	Covers area within ERYC's jurisdiction. Covers the Project's Onshore Development Area and is within the Air Quality Study Area.	2018 – 2023	Local monitoring data and baseline pollutant information.
Hull City Council Air Quality Annual Status Report	Covers area within Hull City Council's jurisdiction. Outside of the Project's Onshore Development Area but within Air Quality Study Area.	2018 - 2023	
Defra's LAQM Support Portal	UK	Assessment years	2021-based 1 x 1km grid background pollution maps and road traffic modelling tools.
Centre for Ecology and Hydrology (CEH)	UK	2024	APIS. Details of Critical Levels and Loads for ecological habitats and baseline pollution information.

20.5.2.2 Site-Specific Surveys

51. No site-specific surveys have been undertaken for the air quality and dust assessment as sufficient data is publicly available to characterise the baseline environment, as identified in **Table 20-10**.

20.5.3 Impact Assessment Methodology

52. **Chapter 6 Environmental Impact Assessment Methodology** sets out the overarching approach to the impact assessment methodology. The topic-specific methodology for the air quality and dust assessment is described further in this section.

20.5.3.1 Construction Dust and Fine Particulate Matter Emissions

53. Assessment of potential impacts associated with construction dust and fine particulate matter emissions has been undertaken in accordance with the IAQM guidance on the assessment of dust from demolition and construction (IAQM, 2024). The terminology therefore differs from the generic impact assessment terminology presented within **Chapter 6 Environmental Impact Assessment Methodology**.

54. A summary of the assessment process is provided below. Full details of the assessment methodology are provided in **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment Methodology**.

20.5.3.1.1 Assessment Steps

55. The assessment steps are as follows:

    1. Screen the need for a more detailed assessment;
    2. Undertake the assessment separately for demolition, earthworks, construction and trackout (i.e. the transport of dust and dirt from the construction site onto the public road network by vehicles leaving the site):
        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.

56. It is anticipated that there will be no dust-generating demolition required as part of the construction phase of the Project. Therefore, this has been not considered as part of the assessment.

20.5.3.1.2 Receptor Sensitivity

57. Definitions of the different sensitivity levels for human and ecological receptors to dust (IAQM, 2024) are presented in **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment Methodology**.

20.5.3.1.3 Impact Magnitude

58. The magnitude of construction dust emissions is 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.

59. The IAQM guidance provides indicative ranges to determine potential dust emission magnitude, including for the area of a site, the total building volume and the number of outward vehicle trips. Other factors are also considered, such as soil type, construction materials and on-site road surface material. These factors are considered together for each activity and used to determine the potential dust emission magnitude.

60. The criteria for potential dust emission magnitudes for each activity of relevance to the Project are presented in **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment Methodology**.

20.5.3.1.4 Effect Significance

61. The potential 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 **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment Methodology**. This assessment deviates slightly from the methodology set out in **Chapter 6 Environmental Impact Assessment Methodology**, as the IAQM guidance does not assign an effect significance before applying mitigation measures. Once appropriate mitigation measures have been identified in-line with the identified level of risk to receptors, the significance of construction phase impacts can be determined. The IAQM guidance considers it to be most appropriate to only assign effect significance post-mitigation because it assumes mitigation is inherent in the design and 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 effect of dust generated during construction would be not significant.

20.5.3.2 Construction NRMM Emissions

62. Defra technical guidance LAQM.TG22 (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. However, construction activities, for example trenchless crossing techniques, may temporarily increase pollutant concentrations in the vicinity of receptors.

63. NRMM control measures will be implemented as embedded mitigation, as detailed in **Table 20-8**. Therefore, a qualitative assessment of project-generated NRMM emissions during construction of onshore infrastructure has been undertaken as part of the assessment where impacts on receptors may occur. The assessment has therefore focused on locations of intensive construction activities (e.g. trenchless crossings and temporary construction compound locations).

64. 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, 2024a));
- and
- Prevailing meteorological conditions.

65. The significance of effect has been determined using professional judgement, taking into account the factors above.

20.5.3.3 Construction Road Vehicle Exhaust Emissions

20.5.3.3.1 Screening Criteria and Assessed Road Links and Haulage Routes

66. The requirement for a detailed assessment of construction vehicle exhaust emissions at sensitive human receptor locations has been considered using the screening criteria provided by the IAQM and EPUK Land-Use Planning & Development Control: Planning for Air Quality guidance (IAQM and EPUK, 2017). This approach was agreed through technical consultation via email by ERYC (dated 9th October 2024) and Hull City Council (dated 21st January 2025) (see **Section 20.3**).

67. Natural England guidance on the assessment of road traffic impacts on designated ecological sites (Natural England, 2018) references the screening criteria contained in the Design Manual for Roads and Bridges LA105 air quality guidance (National Highways, 2024)[1]. As such, these criteria have been used to screen the potential for air quality impacts at ecological receptor locations. The assessment screening criteria are detailed in **Table 20-11**.

Table 20-11 Road Traffic Assessment Screening Criteria

Guidance Document	Receptor	Screening Criteria	
IAQM and EPUK (2017)	Human receptors	Light Duty Vehicles (LDV)	A change in AADT of more than 100 within or adjacent to an AQMA, or more than 500 elsewhere.
		Heavy Duty Vehicles (HDV)	An increase in HDV AADT movements of more than 25 per day within or adjacent to an AQMA, or more than 100 elsewhere.
National Highways (2024)	Ecological receptors	AADT (all vehicles)	Increase of 1,000 AADT or more.
		HDV	An increase in HDV movements of 200 AADT or more.

68. The increases in traffic flows on the road network associated with the Project have been screened using the criteria detailed in **Table 20-11**.

69. The screening criteria for ecological receptors are considered by Natural England to equate to a 1% change in the Critical Level or Load (Natural England, 2018) which is regarded as a threshold of being not significant. A change less than this magnitude is likely to be within the natural range of fluctuation in deposition and is unlikely to be perceptible. Ecological receptors are screened using data for traffic introduced by the Project alone and also inclusive of in-combination traffic growth from the base year to the future base year. Further information on the approach to be taken for the ES in relation to ecological receptors and in-combination traffic data is provided in **Section 20.7.1.3.2**.

[1] The Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations references National Highways. Design Manual for Roads and Bridges Volume 11 Section 3, Part 1 - Air Quality which has subsequently been updated since the Natural England (2018) guidance was published

70. If vehicle movements generated by the Project are below the IAQM and EPUK (IAQM and EPUK, 2017) screening thresholds detailed in **Table 20-11**, then the effects on human receptors are also considered to be not significant and can be screened out of further consideration.

71. The road links which are predicted to experience increases in vehicle numbers and HGV in exceedance of the receptor screening criteria for the Project's construction phase are detailed in **Table 20-12**.

72. Traffic flows on temporary haul roads within the Onshore Development Area to be used for the Project during construction have also been screened against the criteria for ecological receptors detailed in and discussed in **Section 20.5.3.3.9**.

20.5.3.3.2 Assessment Scenarios

73. The onshore construction works of the Project are expected to occur over an approximate five-year period, with the earliest construction start year assumed to be 2029.

74. To provide a conservative assessment, the annual average project-generated traffic across the construction period has been assumed to occur during the earliest year of construction. This is because pollutant emission rates and background concentrations will be higher in 2029 than in later years of construction.

75. Peak construction flows have not been used in the assessment. This is because peak construction would occur over a one or two-month period or less. Therefore, using these to derive AADT across a full year would unrealistically inflate the impacts of construction generated traffic. The use of average construction flows was deemed to be robust, and a more appropriate representation of construction impacts from traffic over an annual period, which aligns with the requirement for use of AADT flows.

76. As detailed in **Chapter 26 Traffic and Transport**, only a preliminary assessment of cumulative traffic and transport effects has been undertaken for the PEIR, and a full cumulative effects assessment (CEA) will be undertaken at ES stage. The CEA section of **Chapter 26 Traffic and Transport** is limited to identifying other plans and projects which will be included in the CEA to be presented in the ES and does provide the traffic data for these cumulative plans and projects. Hence, the cumulative road vehicle exhaust emission effects will be assessed in the ES.

77. The assessment has therefore considered the following three scenarios:

- Verification and Base year (2023);
- Construction Year (2029) without the Project (including background traffic growth); and
- Construction Year (2029) with the Project (including background traffic growth).

78. It should be noted that traffic data does not include any changes to baseline traffic flows as a result of the A63 Castle Street Improvements Scheme in Hull, nor the A164 and Jocks Lodge Improvement Scheme. These are currently under construction and will be operational prior to construction of the Project. **Chapter 26 Traffic and Transport** outlines that the approach to deriving baseline traffic flows has been agreed with the relevant highway authorities (namely, ERYC, Hull City Council and National Highways) through the second ETG8 meeting held on the 30th September 2024.

20.5.3.3.3 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.

80. ERYC does not undertake any monitoring of background pollutant concentrations. Hull City Council undertakes urban background monitoring at a co-located automatic monitoring site and a triplicate diffusion tube site. To understand whether the Defra background map concentrations are representative of the Air Quality Study Area, a comparison has been made between the 2023 annual mean monitored concentrations and the Defra background maps (Defra, 2024a) for the corresponding grid square, as detailed in **Table 20-13**.

81. As shown in **Table 20-13**, the Defra background maps are predicting slightly lower concentrations for the grid square that the urban background monitoring sites are located within. Although the reported monitored concentrations are slightly higher than Defra backgrounds, no receptors are located within the same grid square as the background monitor site. Furthermore, the Air Quality Study Area is predominantly rural in nature and therefore Defra backgrounds are considered to provide a more appropriate representation of expected concentrations in these locations.

82. Background NO_2, NO_x PM_{10} and $PM_{2.5}$ concentration projections have therefore been obtained from Defra mapping (Defra, 2024a) for the 1 x 1km grid squares corresponding to sensitive receptor locations within the ERYC and Hull City Council administrative boundaries for the 2023 and 2029 assessment years. This was agreed through technical consultation via email by ERYC (dated 9th October 2024) and Hull City Council (dated 21st January 2025).

Table 20-12 Receptor Screening – Affected Road Links Under the Project's Construction

Link ID	Road	Number of Vehicles Generated by the Project's Construction Activities as AADT (2029)		Screened in for Human Receptors Criteria	Increase in the Number of Vehicles Generated by the Project's Construction Activities In-Combination (including background traffic growth from 2023 to 2029) as AADT (2029)		Screened in for Ecological Receptors Criteria
		LDV	HDV		LDV	HDV	
3	A165 Between Skipsea Road and Grange Road	537	**286**	Yes	1,393	336	No*
4	A165 Between Grange Road and Brandesburton Roundabout	797	**286**	Yes	1,460	307	No*
5	A165 between A1035 and New Road	797	**286**	Yes	1,803	345	No*
6	A1035 between Leven Roundabout and White Cross Roundabout	802	**286**	Yes	1,826	297	No*
7	A1035 between White Cross Roundabout and Hall Farm	817	**323**	Yes	1,979	352	No*
8	A1035 between Hall Farm and Swinemoor Lane Roundabout	922	**323**	Yes	2,085	352	No*
9	A1035 between Swinemoor Roundabout and Driffiled Roundabout	653	**323**	Yes	1,566	353	No*
10	A1035 between Driffiled Roundabout and Dog Kennel Lane Roundabout	850	**334**	Yes	1,674	367	No*
11	A1035 between Dog Kennel Lane Roundabout and Killingravesworld Roundabout	949	**334**	Yes	1,775 to	371	No*
12	A1035 between Killingravesworld Roundabout and Jocks Lodge Roundabout	993	**334**	Yes	**2,161**	**384**	Yes
13	A164 Jocks Lodge between A1079 and A164 northern diverge point	**1539**	**334**	Yes	3,233	387	No
14	A164 Northbound only from southern diverge point	799	**167**	Yes	1,660	194	No*
15	A164 southbound only from northern diverge point	799	**167**	Yes	1,633	193	No*
16	A164 from Southern diverge point to Dunflat Road	**1539**	**334**	Yes	3,233	387	No*

Link ID	Road	Number of Vehicles Generated by the Project's Construction Activities as AADT (2029)		Screened in for Human Receptors Criteria	Increase in the Number of Vehicles Generated by the Project's Construction Activities In-Combination (including background traffic growth from 2023 to 2029) as AADT (2029)		Screened in for Ecological Receptors Criteria
		LDV	HDV		LDV	HDV	
17	A164 between Dunflat Road and the B1233	**1539**	**334**	Yes	3,233	387	No*
18	A164 between B1233 and Castle Road	**1146**	**334**	Yes	2,840	387	No*
19	A164 between Castle Road and the B1232	939	**334**	Yes	2,633	387	No*
20	A164 between the B1232 and B1231	752	**334**	Yes	1,865	385	No*
21	A164 between the B1231 and Boothferry Road	628	**334**	Yes	1,741	385	No*
22	A15 - Boothferry Road	220	**334**	Yes	**1,822**	**448**	Yes
23	A63 - Hull West	220	**334**	Yes	**3,944**	**789**	Yes
24	A63 between Boothferry Road and the A1166	0	**334**	Yes	**4,950**	**790**	Yes
25	A63 between the A1166 and Daltry Street	0	**334**	Yes	**4,492**	**728**	Yes
26	A63 between Daltry Street and the A1165	36	**334**	Yes	**3,855**	**712**	Yes
27	A63 between the A1165 and Southcoates Roundabout	0	**334**	Yes	2,322	540	No*
28	A1033 (between Southcoates Roundabout to Northern Gateway	23	**334**	Yes	2,853	628	No*
29	A1033 (between Northern Gateway and Marfleet Roundabout)	23	**334**	Yes	2,853	628	No*
30	A1033 (between Marfleet Roundabout and B1362)	39	**334**	Yes	1,855	482	No*
31	A1033 (between Mount Pleasant North Roundabout and A165 Holderness Road)	59	**334**	Yes	1,230	392	No*
33	A165 Holderness Road (between Maybury Road and Main Road)	60	**323**	Yes	1,242	372	No*

Link ID	Road	Number of Vehicles Generated by the Project's Construction Activities as AADT (2029)		Screened in for Human Receptors Criteria	Increase in the Number of Vehicles Generated by the Project's Construction Activities In-Combination (including background traffic growth from 2023 to 2029) as AADT (2029)		Screened in for Ecological Receptors Criteria
		LDV	HDV		LDV	HDV	
34	A165 (between Main Road and Main Street)	63	**323**	Yes	1,489	351	No*
35	A165 (between Main Street and Skirlaugh)	60	**323**	Yes	1,485	351	No*
36	A165 - Skirlaugh	62	**323**	Yes	732	345	No*
37	A165 (between Skirlaugh and the A1035)	75	**323**	Yes	745	345	No*
38	A1033 (between Holderness Road and Sutton Road)	105	**334**	Yes	1,499	423	No*
39	A1033 (between Howell Road and Stockholme Road)	90	**334**	Yes	1,245	368	No*
40	A1033 (between Stockholm Road and Roebank Roundabout)	90	**334**	Yes	1,245	368	No*
41	A1033 (between Roebank Roundabout and Dunswell Roundabout)	292	**334**	Yes	1,463	392	No*
42	A1079 (between Dunswell Roundabout and Jocks Lodge Roundabout)	539	**334**	Yes	1,676	378	No*
45	A164 (between the A1174 and Jocks Lodge)	513	**234**	Yes	1,227	256	No*
46	Jocks Lodge (between Minster Way and the A1079)	513	**234**	Yes	1,632	272	No*
48	Neptune Street	0	**334**	Yes	**381**	**341**	Yes
49	Jackson Street/ Daltry Street	0	**334**	Yes	851	346	No*
50	English Street/ Kingston Street/Commercial Road	0	**334**	Yes	721	337	No*
51	Maybury Road/Marfleet Lane	58	**323**	Yes	912	336	No*
52	Coppleflat Lane between A164 to OCS	701	**291**	Yes	1,109	294	No*

Link ID	Road	Number of Vehicles Generated by the Project's Construction Activities as AADT (2029)		Screened in for Human Receptors Criteria	Increase in the Number of Vehicles Generated by the Project's Construction Activities In-Combination (including background traffic growth from 2023 to 2029) as AADT (2029)		Screened in for Ecological Receptors Criteria
		LDV	HDV		LDV	HDV	
53	Bentley Lane between OCS and Broadgate	0	**291**	Yes	408	294	No*
63	A164 (between Driffiled Road Roundabout and Old Road)	303	**110**	Yes	788	134	No
65	A164 (between Old Road and Opnshore EEC)	313	**110**	Yes	770	128	No
71	B1249 (Bridlington Balk)	72	**145**	Yes	283	148	No
72	North Frodingham Road	72	**145**	Yes	284	148	No
74	A1033 (between Mount Pleasant North Roundabout and Southcoates Roundabout)	23	**167**	Yes	668	212	No*
75	A63 (Off ramp to Mount Pleasant North Roundabout)	36	**167**	Yes	368	189	No
79	Grange Road	270	**187**	Yes	487	189	No
80	A15-Humber Bridge	408	0	No	**1,863**	**116**	Yes

Values in bold show traffic flows (LDV and/or HDV) that exceed the corresponding IAQM & EPUK (2017) criteria.

*In-combination flows in exceedance of National Highways (2024) criteria however, road link is not within 200m of an ecological receptor.

Values in bold show traffic flows (LDV and / or HDV) that exceed the corresponding National Highways (2024) criteria at link within 200m of ecological receptors.

Table 20-13 Comparison of Monitored Concentrations at Urban Background Sites Within Hull City Council Against Defra Background Maps (Defra, 2024a)

Local Authority	Site ID	Distance from Modelled Road Network	2023 Annual Mean Concentration ($\mu g.m^{-3}$)	
			Monitored Concentration	Defra Background Maps
Hull City Council	CM2	890m north	17.0	16.5
	DT17, 18, 19		17.7	

83. Background NH_3, nutrient nitrogen and acid deposition fluxes have been obtained from the APIS website (CEH, 2023) and are provided for 1 x 1km grid squares. The data are provided as three-year averages (2020-2022) but, unlike the Defra mapping, are not projected forward to future years. The Nitrogen Futures (Dragosits *et al*. 2020) study forecasts a minimum rate of improvement in background nitrogen of 0.07kgN.ha^{-1}.yr^{-1} at Ashdown forest, with other forecasts indicating a greater rate of reduction. In line with the forecast for Ashdown Forest, and therefore taking a precautionary approach, this assessment applies a projected decrease in background nutrient nitrogen deposition rate of 0.07kgN.ha^{-1}.yr^{-1}.

20.5.3.3.4 Dispersion Modelling Methodology

84. 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 $PM_{2.5}$. For ecological receptors, the pollutants of concern are NOx, NO_2 and NH_3. Concentrations of these pollutants are therefore the focus of the ADMS-Roads assessment.

20.5.3.3.4.1 Traffic Data

85. The derivation of the traffic data used in the air quality assessment is detailed in **Chapter 26 Traffic and Transport**.

86. 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 **Volume 2, Appendix 20.3 Construction Road Vehicle Exhaust Emissions Assessment – Traffic Data**.

87. Traffic data have been factored to account for traffic growth between 2023 and 2029, 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 Local Plan development allocations (e.g. residential developments).

88. Traffic speeds have been provided as an average speed along each road link. For specific cases, the following assumptions for traffic speeds included in the air dispersion model are as follows:

- Large roundabouts modelled at 40km.hr^{-1};
- Small roundabouts and queues modelled at 20km.hr^{-1}; and
- Speed data for free-flowing traffic conditions have been obtained from average speeds recorded during the traffic count surveys (discussed in **Chapter 26 Traffic and Transport**) where available, or national speed limits.

20.5.3.3.4.2 Emissions Factors

89. Emissions factors have been obtained from the Emissions Factors Toolkit (EFT) v12.1 provided by Defra (Defra, 2024c). Emissions factors for 2023 have been used in the verification and base year assessment and emissions factors for 2029 have been used in the future year 'without Project' and 'with Project' scenarios.

90. There has historically been uncertainty in the future vehicle emissions projections in previous versions of the EFT, particularly v8.0 and earlier. A position statement dealing with uncertainty in vehicle NOx emissions within air quality assessments, was published in July 2018 by the IAQM (IAQM, 2018). The position statement identifies that previous versions of Defra's EFT (v8.0 and before) predicted large reductions in NOx emissions that were not borne out in measured roadside concentrations, due to vehicle standards used in the fleet forecasting not being realised. It stated that a growing body of evidence suggested that the latest vehicle emission factors, which feed into the EFT (v9 and onwards), reflect real-world NO_x emissions from road traffic more accurately. It was therefore judged that an exclusively vehicle emissions-based sensitivity test is no longer necessary in air quality assessments (IAQM, 2018). Given this evidence, the use of emissions factors for the year corresponding to the model scenarios (2023 and 2029) is considered to be appropriate. This was agreed with ERYC through technical consultation via email (dated 9th October 2024) and with City of Hull Council (dated 21st January 2025).

20.5.3.3.4.3 Meteorological Data

91. Leconfield meteorological station is located within the Air Quality Study Area, the data from which has been used to replicate meteorological conditions within the ADMS-Roads model.

92. The use of the Leconfield meteorological station data (2023) was agreed with ERYC and City of Hull Council through technical consultation via email (dated 9th October 2024 and 21st January 2025 respectively).

20.5.3.3.4.4 Surface Roughness

93. 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 on the Earth's surface to the approaching wind. A variable surface roughness file has been used in the model to represent the varying surface roughness within the Air Quality Study Area, given that both rural and urban locations have been included. A surface roughness of 0.7m, which is representative of small cities with suburban areas, has been selected to represent the city of Hull. A surface roughness of 0.3m has been selected to represent the rural areas as well as the Leconfield meteorological site which is representative of 'agricultural areas (max)'. A surface roughness of 0.0001m representative of areas of open water has been selected to represent the Humber Estuary and North Sea around the landfall.

20.5.3.3.5 Human Receptor Methodology

20.5.3.3.5.1 Model Verification

94. Model verification is the process of deriving an appropriate adjustment factor(s) to adjust model outputs to improve the consistency of modelling results with respect to available monitored data. In this assessment, model uncertainty has been minimised following Defra (2022b) and IAQM and EPUK (2017) guidance.

95. 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 because the inclusion of these sites may lead to an over-adjustment of modelling at roadside sites (Defra, 2022b). Therefore, kerbside monitoring locations have been excluded from the model verification process.

96. Monitoring locations within the Air Quality 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 as a result of emissions from these sources not being accounted for in the model.

97. 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, the latter being more rural or suburban in nature.

98. Background concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been obtained from the latest 2021-based air pollutant concentration maps provided by Defra (Defra, 2024a) for the grid squares covering the Air Quality Study Area.

20.5.3.3.5.1.1 Hull City Council

99. A review of the monitoring data identified four roadside NO_2 monitoring locations located on the modelled road network with available data for 2023. These monitoring locations and the reason for their inclusion or exclusion in the verification process are detailed in **Table 20-14**.

Table 20-14 Model Verification Monitoring Locations – Hull City Council

Site ID	Site Type	Included or Excluded	Reasoning
CM3	Roadside	Included	Located on Link 32 (A165) which has been included in the model for verification purposes only. This is a roadside monitoring site which has monitoring data available for 2023. The monitor is located opposite a bus stop which will influence monitored concentrations and cannot be easily modelled in ADMS-Roads. However, the monitor has been included to provide a robust worst-case assessment.
DT50	Roadside	Included	Located on Link 30 (A1033), this is a suitable roadside monitoring site and has monitoring data available for 2023.
DT11	Roadside	Excluded	This diffusion tube is located on the Hessle Road roundabout which contains traffic from road links outside of the Air Quality Study Area. This monitor has therefore been excluded.
DT13	Roadside	Excluded	This diffusion tube is located on Link 26 (A63) opposite an active construction site. A desktop survey showed that construction hoardings have been erected between the diffusion tube and the road, which will impact upon monitored concentrations. This can be seen in the reported concentrations which reduced from 25.2µg.m^{-3} in 2022 to 22.7µg.m^{-3} in 2023. This monitor is deemed not representative for 2023 and has therefore been excluded.

100. Details of the NO_2 model verification process, undertaken using 2023 monitoring data, are provided in **Table 20-15**.

Table 20-15 Model Verification NO_2 (adjustment factor highlighted in bold) – Hull City Council

Model Verification	Site Type	
	CM3	DT50
2023 Annual Mean Monitored Total NO_2 Concentration ($\mu g.m^{-3}$)	22.2	30.5
2023 Annual Mean Background NO_2 Concentration ($\mu g.m^{-3}$)	13.2	20.9
Monitored Road Contribution NO_x (total - background) ($\mu g.m^{-3}$)	20.3	23.0
Modelled Road Contribution NO_x (excludes background)	4.5	10.7
Ratio of Monitored Road Contribution NO_x / Modelled Road Contribution NO_x	4.5	2.2
Adjustment Factor for Modelled Road Contribution	**2.5**	
Adjusted Modelled Road Contribution NO_x ($\mu g.m^{-3}$)	11.4	26.8
Modelled Annual Mean Total NO_2 (based on empirical NO_x / NO_2 relationship) ($\mu g.m^{-3}$)	18.37	32.9
Monitored Annual Mean Total NO_2 ($\mu g.m^{-3}$)	22.2	30.5
% Difference [(modelled - monitored) / monitored] x 100	-17%	5%

101. The Root Mean Square Error (RMSE) is "used to define the average error or uncertainty of the model" and should be within 10% of the annual mean NO_2 objective of $40\mu g.m^{-3}$ (i.e. $4\mu g.m^{-3}$), as specified in Defra technical guidance TG (22) (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 $2.9\mu g.m^{-3}$. Model performance in this assessment was therefore considered to be suitable because the RMSE is within the ideal value.

102. Verification of modelled PM_{10} concentrations has been carried out using the continuous analyser CM3, located on the A165 Holderness Road. The PM_{10} verification process is detailed in **Table 20-16**.

Table 20-16 Model Verification PM_{10} (adjustment factor highlighted in bold) – Hull City Council

Model Verification	Site Type
	CM3
2023 Annual Mean Monitored Total PM_{10} Concentration ($\mu g.m^{-3}$)	15.0
2023 Annual Mean Background PM_{10} Concentration ($\mu g.m^{-3}$)	13.5
Monitored Road Contribution PM_{10} (total - background) ($\mu g.m^{-3}$)	1.5
Modelled Road Contribution PM_{10} (excludes background)	0.7
Ratio of Monitored Road Contribution PM_{10} / Modelled Road Contribution PM_{10}	**2.2**

103. There are no $PM_{2.5}$ monitoring sites located on the modelled road network. Therefore, the derived PM_{10} adjustment factor for Hull City Council has been applied to the modelled $PM_{2.5}$ concentrations.

20.5.3.3.5.1.2 East Riding of Yorkshire Council

104. A review of the monitoring data identified three NO_2 diffusion tubes located on the modelled road network with available data for 2023. These diffusion tubes and the reason for their inclusion or exclusion in the verification process are detailed in **Table 20-17**.

Table 20-17 Model Verification NO_2 Monitoring Locations – East Riding of Yorkshire Council

Site ID	Site Type	Included or Excluded	Reasoning
S23	Roadside	Included	Located on Link 30 (A1033), this is a suitable roadside monitoring site and has monitoring data available for 2023.
S50	Roadside	Included	Located on Link 65 (A164), this is a suitable roadside monitoring site and has monitoring data available for 2023.
S72	Roadside	Included	Located on Link 7 (A1035), this is a suitable roadside monitoring site and has monitoring data available for 2023.

105. Details of the NO_2 model verification process, undertaken using 2023 monitoring data, are provided in **Table 20-18**.

Table 20-18 Model Verification (adjustment factor highlighted in bold) – East Riding of Yorkshire Council

Model Verification	Site Type		
	S23	**S50**	**S72**
2023 Annual Mean Monitored Total NO_2 Concentration (µg.m^{-3})	22.2	9.9	19.4
2023 Annual Mean Background NO_2 Concentration (µg.m^{-3})	15.1	4.6	5.9
Monitored Road Contribution NO_x (total - background) (µg.m^{-3})	15.9	10.2	29.7
Modelled Road Contribution NO_x (excludes background)	9.3	4.1	9.4
Ratio of Monitored Road Contribution NO_x / Modelled Road Contribution NO_x	1.7	2.7	3.2
Adjustment Factor for Modelled Road Contribution	**2.5**		
Adjusted Modelled Road Contribution NO_x (µg.m^{-3})	22.9	10.0	23.2
Modelled Annual Mean Total NO_2 (based on empirical NO_x / NO_2 relationship) (µg.m^{-3})	25.1	9.5	16.7
Monitored Annual Mean Total NO_2 (µg.m^{-3})	22.2	9.9	19.4
% Difference [(modelled - monitored) / monitored] x 100	13%	-4%	-14%

106. The RMSE is "used to define the average error or uncertainty of the model" and should be within 10% of the annual mean NO_2 objective of 40µg.m^{-3} (i.e. 4µg.m^{-3}), as specified in Defra technical guidance TG (22) (Defra, 2022b). If the RMSE value is higher than ± 25% of the objective (i.e. 10µg.m^{-3}), Defra guidance recommends that model inputs and verification should be revised. The RMSE of the model in this instance was 2.3µg.m^{-3}. Model performance in this assessment was therefore considered to be suitable because the RMSE is within the ideal value.

107. ERYC did not undertake monitoring of PM_{10} or $PM_{2.5}$ in 2023 therefore it is not possible to undertake model verification of these pollutants. The derived PM_{10} adjustment factor for Hull City Council has therefore been applied to the modelled PM_{10} and $PM_{2.5}$ concentrations within ERYC to provide a conservative assessment.

20.5.3.3.5.2 NOx to NO_2 Conversion

108. NO_x concentrations have been predicted using the ADMS-Roads model. The modelled road contribution of NO_x at the identified receptor locations have then been converted to NO_2 using the NO_x to NO_2 calculator (v9.1) (Defra, 2024b), in accordance with Defra guidance (Defra, 2022b).

20.5.3.3.5.3 Calculation of Short-term Pollutant Concentrations

109. 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 an empirical relationship with the predicted PM_{10} annual mean concentration. The relevant calculation utilised in the prediction of short-term PM_{10} concentrations was:

$$\text{No. 24-hour mean exceedances} = -18.5 + 0.00145 \times \text{annual mean}^3 + \left(\frac{206}{\text{annual mean}}\right)$$

110. Research projects completed on behalf of Defra and the Devolved Administrations (Laxen and Marner, 2003; AEAT, 2008) concluded that the 1-hour mean NO_2 objective is not likely to be exceeded if annual mean concentrations are predicted to be less than 60 µg.m^{-3} at locations where road traffic is the primary source of pollutant emissions (i.e. roadside and kerbside locations). This value was therefore used as an annual mean equivalent threshold to evaluate likely exceedances of the 1-hour mean NO_2 objective.

20.5.3.3.5.4 Receptor Sensitivity

111. The sensitivity of a human receptor is not considered in the assessment of air quality impacts. The air quality objectives in **Table 20-19**, which are health-based, only apply at locations where there is relevant public exposure as detailed in the table.

112. 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.

Table 20-19 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 eight-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 eight-hour mean objectives apply, as well as kerbside sites (for example, pavements of busy shopping streets).	Gardens of residential properties.

20.5.3.3.5.5 Impact Magnitude and Effect Significance

113. 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, the criteria detailed below has been utilised in the assessment to provide consideration of the impacts associated with the Project.

114. 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 20-20**.

Table 20-20 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	>10
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".

115. Further to the determination of the impact at individual receptors, the guidance recommends that assessment is made of the overall significance of the effect of any impacts from a development on local air quality. The overall significance of effect will need to consider the following factors:

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

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

117. Hull City Council provides guidance on determining the significance of effects of a development's impact on air quality in its supplementary planning guidance SPD3 '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 of effects is in line with that detailed above.

20.5.3.3.6 Ecological Receptor Methodology

20.5.3.3.6.1 Receptor Sensitivity (Ecology)

118. Designated ecological sites within 200m of the Traffic and Transport Study Area (as shown on **Figure 26-1** in **Chapter 26 Traffic and Transport**) have been considered only where they are sensitive to the effects of air pollution. Whilst Critical Levels apply regardless of habitat type, Critical Loads are habitat-specific and take into account the sensitivity of each habitat to nitrogen or acidifying effects (see **Section 20.7.1.3.2**).

20.5.3.3.6.2 Impact Magnitude and Effect Significance (Ecology)

119. Natural England considers that, where the contribution of a project leads to pollutant concentration or deposition rate values below 1% of the Critical Level or Critical Load, impacts can be considered to be not significant (Natural England, 2018). Natural England notes that for traffic-related impacts, this equates to a 1,000 AADT or 200 AADT HDV change in traffic flows. This is considered to be a reasonable determination of the level at which impacts of a project or plan are not significant (Natural England 2018). A change less than this magnitude is likely to be within the natural range of fluctuations in deposition and is not likely to be perceptible.

120. 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 airborne NO_x and NH_3 concentrations, and nutrient nitrogen and acid deposition will be included in **Chapter 23 Onshore Ecology and Ornithology**.

20.5.3.3.6.3 In- Combination

121. A project or plan in isolation may not lead to significant effects, however the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (EIA Regulations 2017) require the consideration of impacts associated with a project or plan both in isolation, and in addition to other plans and projects which may affect the same designated site (an 'in-combination' assessment). The outcome of court judgements (notably the Wealden Judgement 2017) has led to the requirement for the 1% criterion to be applied to the in-combination impact to determine whether impacts remain insignificant, or whether further ecological investigation is required (**Section 20.7.1.3.2**). As such, effects on ecological sites are therefore inherently considered cumulatively.

122. The road links which pass alongside the designated sites considered in the assessment (as detailed in **Table 20-12**) will experience background traffic growth between the base year (2023) and the year of peak construction (2029), which will increase nutrient nitrogen deposition at the designated sites. The 1,000 AADT threshold was therefore applied to the 'in-combination' traffic flows (project-generated traffic flows plus background growth) to determine whether a detailed assessment was required.

123. In addition, any consented agricultural or industrial projects in the vicinity of designated sites which may be affected by traffic generated by the Project may also contribute to in-combination NO_x concentrations, NH_3 concentrations, nutrient nitrogen deposition and acid deposition. Natural England developed Sites of Special Scientific Interest (SSSI) Impact Risk Zones (IRZ) which specify the types of projects which may impact upon SSSI based on the distance from the site, as shown in **Table 20-21**.

124. These IRZ criteria will be applied to relevant Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ancient Woodland and Local Nature Reserves (LNR), in addition to SSSI, to provide a conservative in-combination assessment.

125. A search has been carried out for projects within the relevant distances of each ecological receptor screened into the assessment (see **Table 20-25**) which meet the above criteria. This approach is in accordance with the requirements of IAQM guidance on the assessment of air quality impacts on designated nature conservation sites (IAQM, 2020). No consented agricultural or industrial projects in the vicinity of designated sites which may be affected by traffic generated by the Project have been identified for inclusion.

20.5.3.3.7 Emissions Factors

126. Emissions factors for NO_x, PM_{10}, and $PM_{2.5}$ have been obtained from the Emissions Factors Toolkit (EFT) v12.1 provided by Defra (Defra, 2024c). Emissions factors for the corresponding year of the modelled scenario have been used (2023 and 2029).

127. To enable quantification of the impact of NH_3 from road traffic emission, the Air Quality Consultants tool 'CREAM V1A' has been used to provide NH_3 emission factors for inclusion within the model (Air Quality Consultants, 2020a).

20.5.3.3.8 Model Verification

128. The model adjustment factors used for NO_x in the ecological assessment are as per those detailed **Section 20.5.3.3.8**.

Table 20-21 Natural England's Impact Risk Zones for Sites of Special Scientific Interest

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.
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 >500m^2, slurry lagoons and digestate stores >200m^2, 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 >500m^2, slurry lagoons and digestate stores >200m^2, 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.
2 to 5km	Any industrial / agricultural development that could cause air pollution (including industrial processes, livestock and poultry units with floorspace >500m^2, slurry lagoons and digestate stores >750m^2, 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.

20.5.3.3.9 Haul Roads

129. The potential impacts on designated ecological sites as a result of LDV and HGV travelling along the Project's temporary haul roads have been considered.

130. The peak AADT of vehicles travelling along the haul roads have been calculated where the Onshore Development Area is within 200m of a designated ecological site, as described in **Section 20.5.3.3.1**.

131. The impact of haul road traffic on ecological receptors at the landfall, along the onshore ECC and within the OCS zone has therefore been considered as part of this assessment. The sensitive ecological receptors within 200m are detailed in **Table 20-22**. The peak construction traffic flows for the haul road along the onshore ECC have been used to derive AADT flows for the purposes of the air quality assessment, which is considered to represent a conservative scenario.

Table 20-22 Traffic Flows on the Haul Road Within 200m of Designated Ecological Sites

Haul Road Traffic Location	Designated Ecological Site	Distance from Onshore Development Area*	Peak AADT HGV Flows Generated During Construction
Landfall	Withow Gap SSSI and Greater Wash SPA	0	119
Onshore ECC	Levan Canal SSSI	94	123
Onshore ECC	Bryan Mills SSSI	116	123
Onshore ECC	Unnamed Ancient Woodland	58	126
OCS Zone 4	Birkhill Wood Ancient Woodland	90	172

*Worst-case distance from haul road (as the haul road is not likely to be adjacent to the boundary of the Onshore Development Area)

Note: No ecological receptors are located within 200m of OCS Zone 8.

132. As shown above, the number of vehicles travelling along the temporary haul roads do not exceed the ecological screening criteria detailed in **Table 20-11**. As such, impacts on designated sites as a result of haul road traffic have been scoped out and have not been considered further in the assessment of construction road vehicle exhaust emissions.

20.5.3.4 Construction and Operational Vessel Exhaust Emissions

133. As detailed in **Table 20-6**, the assessment of vessel exhaust emissions is limited to the potential impact on onshore ecological receptors.

134. There is no specific guidance on the assessment of impacts from vessel emissions on designated ecological sites. Therefore, the significance of effect has been determined using professional judgement taking into account the duration of activity, prevailing meteorological conditions and the size and type of vessel.

20.5.3.5 Operational NRMM and Backup Generator Emissions

135. Potential impacts from operational NRMM and backup generator have not been assessed in detail as details on the number, size and specific location of backup generators within the OCS zone are not confirmed at this stage and will be determined during detailed design post-consent. Nevertheless, evidence to demonstrate the absence of likely significant effect has been provided in **Section 20.7.2.1**.

20.5.3.6 Operational Road Vehicle Exhaust Emissions

136. As requested by the Planning Inspectorate in the Scoping Opinion (2024) and detailed in **Table 20-6**, the anticipated number of vehicles movements generated during the operation of the Project has been screened against the IAQM EPUK (IAQM and EPUK, 2017) criteria.

20.5.4 Cumulative Effects Assessment Methodology

137. The cumulative effects assessment (CEA) considers other plans and projects that may act collectively with the Project to give rise to cumulative effects on air quality and dust receptors. The general approach to the CEA for air quality and dust involves screening for potential cumulative effects, identifying a short list of plans and projects for consideration and evaluating the significance of cumulative effects. **Chapter 6 Environmental Impact Assessment Methodology** and **Volume 2, Appendix 6.5 Cumulative Effects Screening Report - Onshore** provides further details on the general framework and approach to the CEA.

138. The final assessment of cumulative effects will be undertaken in the ES once further information is available. However, for the purposes of the PEIR, it is possible to identify a number of projects and plans which are likely to feature in the CEA and consider the extent to which cumulative effects might arise. **Section 20.8.3** 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.

20.5.5 Assumptions and Limitations

139. This chapter provides a preliminary assessment of the likely significant effects of the Project in relation to air quality and dust using information available at the time of drafting as described in **Chapter 6 Environmental Impact Assessment Methodology**. This assessment will be refined where relevant and presented in the ES to be submitted with the DCO application.

140. 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 26 Traffic and Transport**.

141. 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 Environment Agency MCERTS accredited reference method monitoring equipment. The uncertainties and limitations in relation to monitored air pollution data are therefore unlikely to significantly affect the certainty of the EIA.

142. 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 1 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. 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. Uncertainties in these mapped background values are not likely to affect the certainty of the EIA and the conclusions of the assessment.

143. **Section 20.2.2.1.3** presents all Critical Levels and / or Loads for feature(s) under each designated ecological site. However, not all of these features (i.e. lichen and bryophytes in woodlands which are assessed against the lower NH_3 Critical Level) may be present at the closest designated site boundary to the affected road link.

144. Local Wildlife Sites (LWS) have not been included in the PEIR assessment with respect to air quality effects on ecological receptors, as limited habitat information is provided in the Priority Habitats Inventory (Natural England, 2024) dataset for these designations. An assessment of impacts on LWS would be considered at ES stage, as required.

20.6 Baseline Environment

145. A desk-based review has been undertaken to determine the air quality baseline within the Air Quality Study Area. The characterisation of the baseline environment has been undertaken using data sources listed in **Table 20-10**. The baseline data sources are sufficient to provide an assessment of potential air quality impacts arising from the Project and were agreed with ERYC and Hull City Council during technical engagement (dated 9th October 2024 and 21st January 2025).

20.6.1 Existing Baseline

20.6.1.1 Local Air Quality Management

146. As stated in its Annual Status Report for 2023 (East Riding of Yorkshire Council, 2024), ERYC has not declared any statutory Air Quality Management Areas (AQMA) within its area of jurisdiction.

147. 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, 2023). The Air Quality Study Area falls within the Hull AQMA No.1.

20.6.1.2 Air Quality Monitoring Data

148. The NO_2 diffusion tube monitoring results within 200m of the road network are listed in **Table 20-23** and results show that the annual mean NO_2 objective of 40 $\mu g.m^3$ has been not exceeded at any diffusion tube location across the five-year period for both the local authorities.

Table 20-23 Annual Mean NO_2 Monitoring Undertaken by East Riding of Yorkshire Council and Hull City Council

Site ID	Location	Automatic Station or Diffusion Tube	Site Type	Monitored Annual Mean NO_2 Concentration (µg.m^{-3})				
				2019	2020	2021	2022	2023
Hull City Council								
CM1	Hull ABP	Automatic Station	Industrial	-	25.3	24.8	23.0	20.2
CM3	Hull Holderness Rd (AURN)	Automatic Station	Roadside	26.0	21.0	22.0	22.0	22.2
1	Plimsoll Way	Diffusion Tube	Roadside	23.6	18.3	20.2	18.5	19.6
11	Daltry St	Diffusion Tube	Roadside	29.5	23	24.9	24.0	21.6
13	Princes Dock Side	Diffusion Tube	Roadside	36.9	30.3	27.8	26.2	22.7
14	Castle St (Road)	Diffusion Tube	Kerbside	36.3	26.1	26.4	26.0	25.1
15	Castle St (Wall)	Diffusion Tube	Urban Centre	31.5	30.7	32.8	31.9	27.2
44	Ashcombe Rd	Diffusion Tube	Roadside	19.6	15.2	16.3	19.7	16.2
47	Hold AQMS	Diffusion Tube	Kerbside	-	-	24.4	25.7	23.6
48	Marfleet Lane	Diffusion Tube	Kerbside	-	-	21.4	23.9	19.1
49	Hall Rd - Marfleet Junction (7/7)	Diffusion Tube	Kerbside	29.8	27.4	26.4	27.8	23.7
50	Hedon Road/Marfleet	Diffusion Tube	Roadside	36.7	31.9	30.5	35.8	30.5
51	Hedon Road/Valetta St	Diffusion Tube	Roadside	34.3	28.5	32.2	31.4	26.3
52	Diadem	Diffusion Tube	Roadside	-	-	-	31.9	28.7
54	Glebe Rd	Diffusion Tube	Kerbside	38.2	32.7	33.4	33.6	34.6
55	Rivaulx Court	Diffusion Tube	Kerbside	-	-	30.6	32.2	31.8
56	Stoneferry Road	Diffusion Tube	Kerbside	34.6	29.8	27.0	30.9	26.9
62	Bedford St	Diffusion Tube	Kerbside	-	-	24.6	26.5	22.0
65, 66, 67	ABP c	Diffusion Tube (Triplicate)	Industrial	-	19.5	23.7	22.9	20.6

Site ID	Location	Automatic Station or Diffusion Tube	Site Type	Monitored Annual Mean NO_2 Concentration ($\mu g.m^{-3}$)				
				2019	2020	2021	2022	2023
ERYC								
S1	EA compound, Railway Cottage, Hessle	Diffusion Tube	Suburban	-	-	-	14.9	15.8
S7	The Homestead, B1242, Atwick	Diffusion Tube	Roadside	-	-	12.7	12.6	11.1
S10	Queensgate (No. 16), Beverley	Diffusion Tube	Kerbside	25.0	20.4	21.8	20.0	19.6
S12	Dunoon, Main Street, Skipsea	Diffusion Tube	Roadside	-	-	10.0	10.1	9.3
S21	Station House, Cliff Bridge, Hessle	Diffusion Tube	Roadside	30.0	25.1	26.4	24.2	23.0
S26	Albion Court/Grovehill Rd. Roundabout, Beverley	Diffusion Tube	Roadside	23.0	19.9	22.1	21.5	12.3
S27	Hull Rd (No. 3), Saltend	Diffusion Tube	Roadside	-	-	23.3	22.4	21.4
S30	Swinemoor Lane / Barmston Road, Beverley	Diffusion Tube	Roadside	-	-	18.1	16.1	15.2
S32	Melton Road, North Ferriby	Diffusion Tube	Roadside	-	-	10.6	9.3	9.0
S33	Swinemoor Lane (No. 9), Beverley	Diffusion Tube	Roadside	-	-	20.1	19.2	18.8
S34	Swinemoor Lane (No. 83), Beverley	Diffusion Tube	Roadside	-	-	10.2	9.8	9.6
S48	Hull Rd/Grovehill Rd. Roundabout, Beverley	Diffusion Tube	Roadside	-	-	-	12.6	10.6
S51	Tower Hill (one way sign), Hessle	Diffusion Tube	Roadside	-	-	15.7	16.3	14.0
S59	69 Southgate, Hornsea	Diffusion Tube	Roadside	31.0	25.1	27.0	23.9	21.4
S62	White House Farm, Scarborough	Diffusion Tube	Roadside	-	-	-	11.1	10.2
S67	Woodgates Lane (No. 35), North Ferriby	Diffusion Tube	Roadside	19.0	16.3	16.7	17.0	15.9
S70	Southgate (No. 56), Hornsea	Diffusion Tube	Roadside	-	14.8	17.5	17.1	16.1

149. The highest monitored annual mean NO_2 concentration within the AQMA in the most recent year of monitoring, 2023, was at DT54, with a monitored annual mean NO_2 concentration of 34.6µg.m^3. Receptors have been included in the road traffic dispersion model representative of residential properties within the AQMA, along the A1033 Hedon Road, to ensure a conservative assessment. 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 upon levels of data capture. Despite this, monitoring still indicates a decreasing trend in annual mean NO_2 concentrations since at least 2019.

150. Particulate matter continuous analyser monitoring was also undertaken within Hull City Council areas. The PM_{10} monitoring results within 200m of the road network are listed in **Table 20-24.** The results detail that annual mean PM_{10} concentrations met the annual mean objectives of 40 µg.m^3.

Table 20-24 Annual Mean PM_{10} Monitoring Undertaken by East Riding of Yorkshire Council and Hull City Council

Site ID	Location	Valid Data Capture in 2023 (%)	Monitored Annual Mean PM_{10} Concentration (µg.m^{-3})				
			2019	2020	2021	2022	2023
Hull City Council							
CM3	Hull Holderness Rd (AURN)	93	21	20	18	19	15
ERYC							
ERYC did not undertake any automatic monitoring during 2023.							

20.6.1.3 Identification of Receptors

20.6.1.3.1 Construction Dust and Fine Particulate Matter Emissions

151. IAQM guidance on the assessment of dust from demolition and construction (IAQM, 2024) states that a detailed assessment is required where there are human receptors within 250m of the site boundary and / or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m 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).

152. The onshore ECC from the landfall to the OCS Zones 4 and 8 and onwards to the grid connection point at Birkhill Wood Substation has been assessed. To allow flexibility for micro-siting of the OCS and ESBI within the OCS zone during detailed design stage post-consent, the worst-case location (i.e. nearest the receptors at the edge of the OCS zones) has been assumed in the assessment on a precautionary basis.

153. 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, temporary construction compound, jointing bay and link box construction) are undertaken in proximity to the greatest number of human and ecological receptors. Recommended mitigation measures for these worst-case locations would then be applied to all onshore construction works to provide a conservative assessment.

154. 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 20-9**), which fall within the Air Quality Study Area. The identified receptors are set out in the following sections.

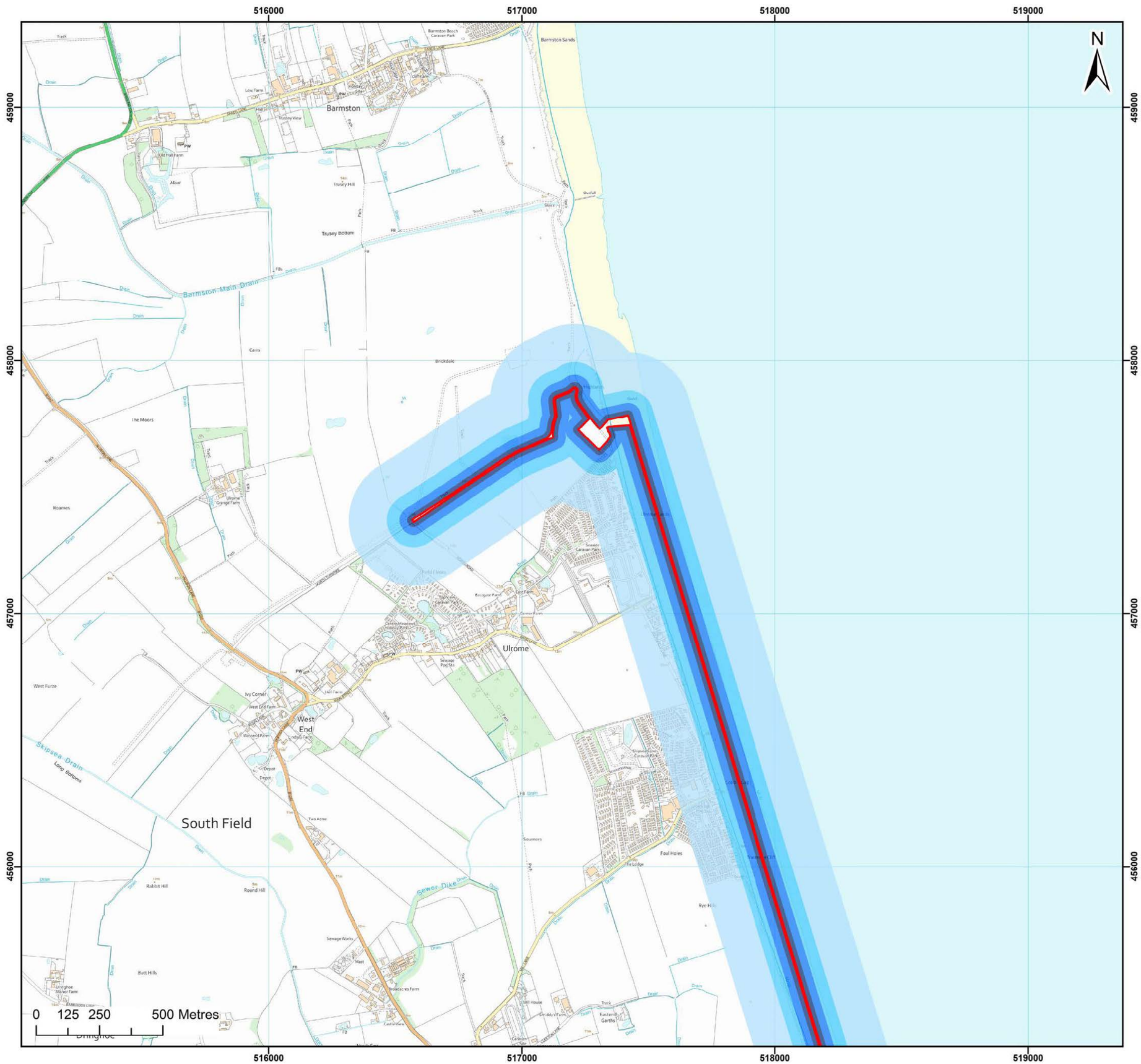
20.6.1.3.1.1 Human Receptors

155. There are human receptors within 250m of the Onshore Development Area located in south Beverley and Leven, with additional isolated farmsteads located along the onshore ECC (as shown on **Figure 20-2**).

156. As detailed in **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment**, the number of receptors potentially exposed to dust impacts is a factor that determines the receptor sensitivity. For the Project, the area with the most human receptors within 250m of the Onshore Development Area is in the south of Beverley.

157. The proximity of temporary construction compounds to receptors has been taken into consideration within the design of the Project and, therefore, the numbers of human receptors within 100m of the proposed temporary construction compounds are limited. **Figure 20-2** shows the indicative locations of temporary construction compounds within the Onshore Development Area. The following locations where compounds may be located have residential properties within 100m:

- North of Scorborough - MCC3 and ICC5;
- East of Bishop Burton – ICC7; and
- Compound within OCS Zone 4.



Legend:

Onshore Development Area

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Air Quality Construction Dust and Fine Particulate Matter Buffers - Sheet 1 of 12

Figure: 20.2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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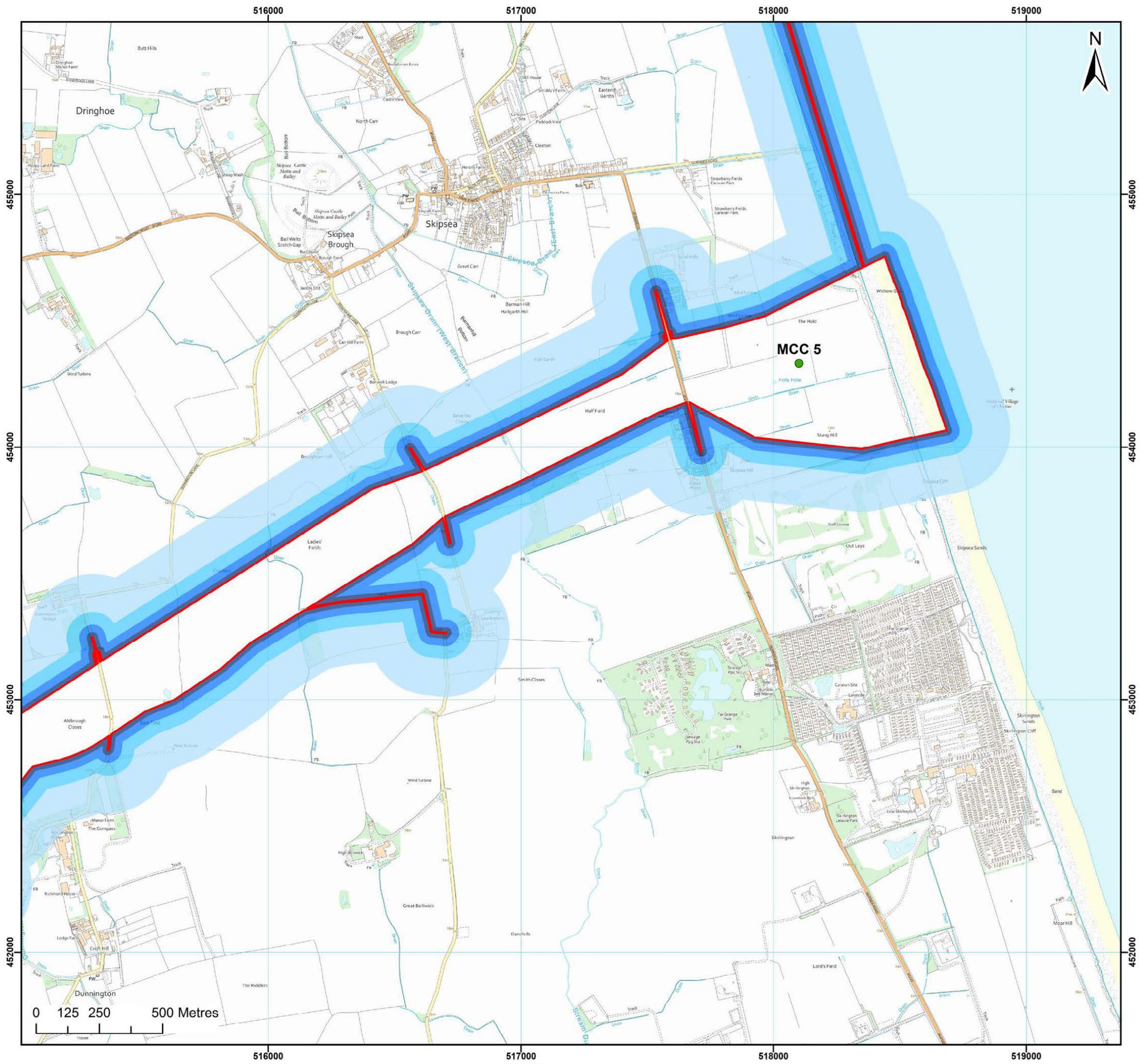

Legend:

Onshore Development Area

Indicative Temporary Construction Compound Locations

Landfall Construction Compound

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Air Quality Construction Dust and Fine Particulate Matter Buffers - Sheet 2 of 12

Figure: 20.2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

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Co-ordinate system: British National Grid

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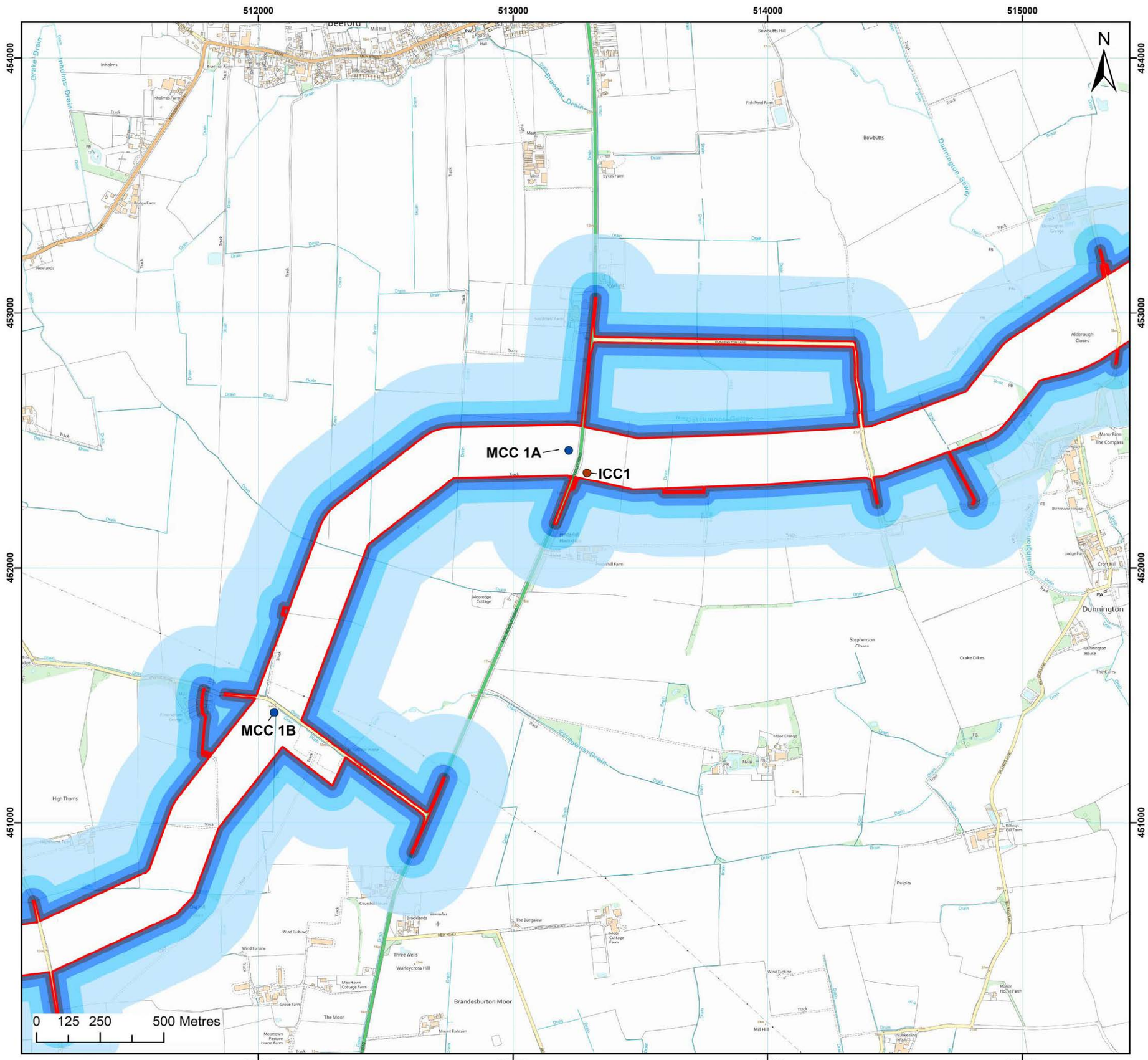

Legend:

Onshore Development Area

Indicative Temporary Construction Compound Locations

- Intermediate Construction Compound for Onshore Export Cable Works
- Main Construction Compound for Onshore Export Cable Works

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Air Quality Construction Dust and Fine Particulate Matter Buffers - Sheet 3 of 12

Figure: 20.2

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Co-ordinate system: British National Grid

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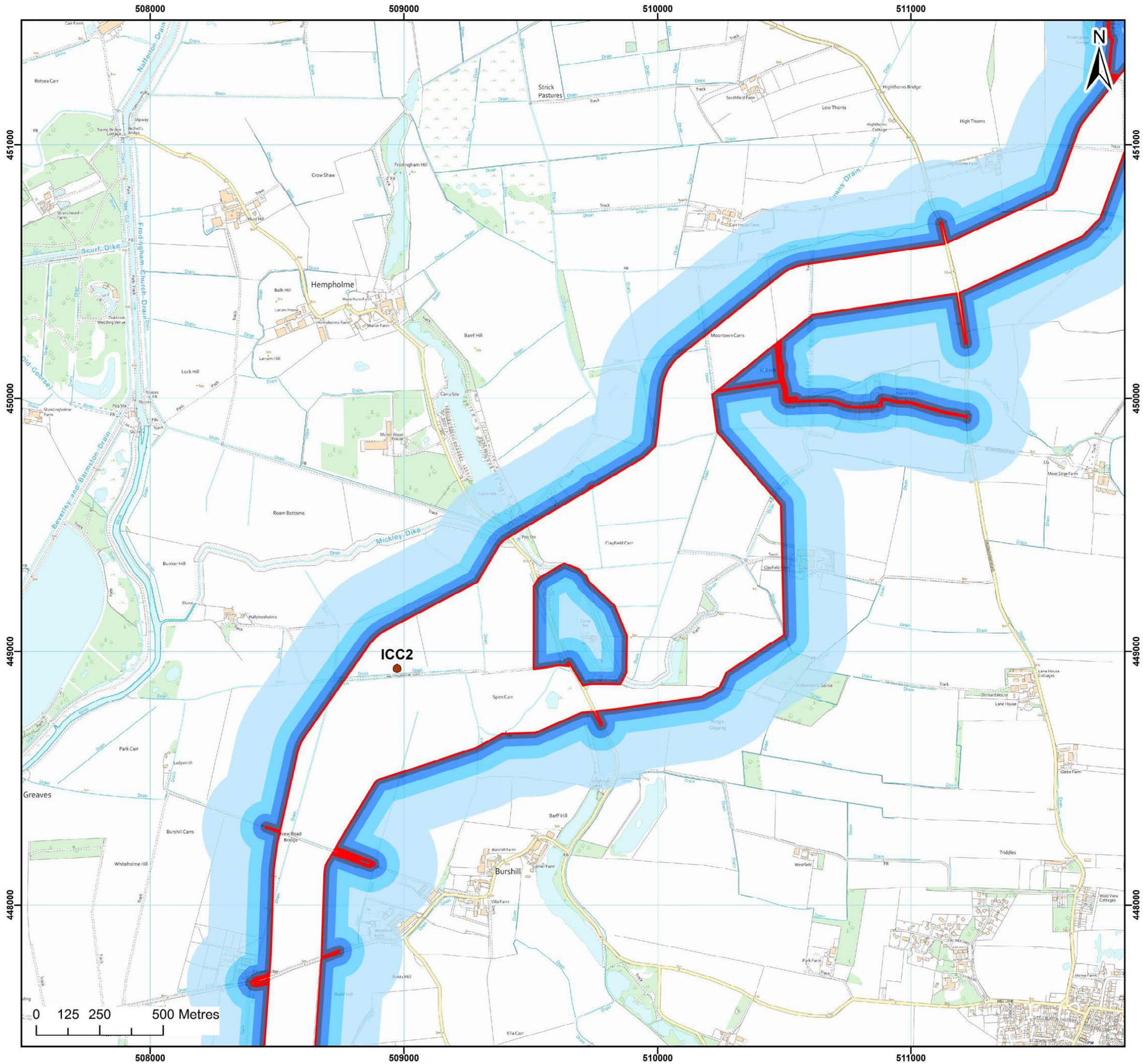

Legend:

Onshore Development Area

Indicative Temporary Construction Compound Locations

Intermediate Construction Compound for Onshore Export Cable Works

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Air Quality Construction Dust and Fine Particulate Matter Buffers - Sheet 4 of 12

Figure: 20.2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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01	16/12/2024	FC	DH	A3	1:15,000

Co-ordinate system: British National Grid

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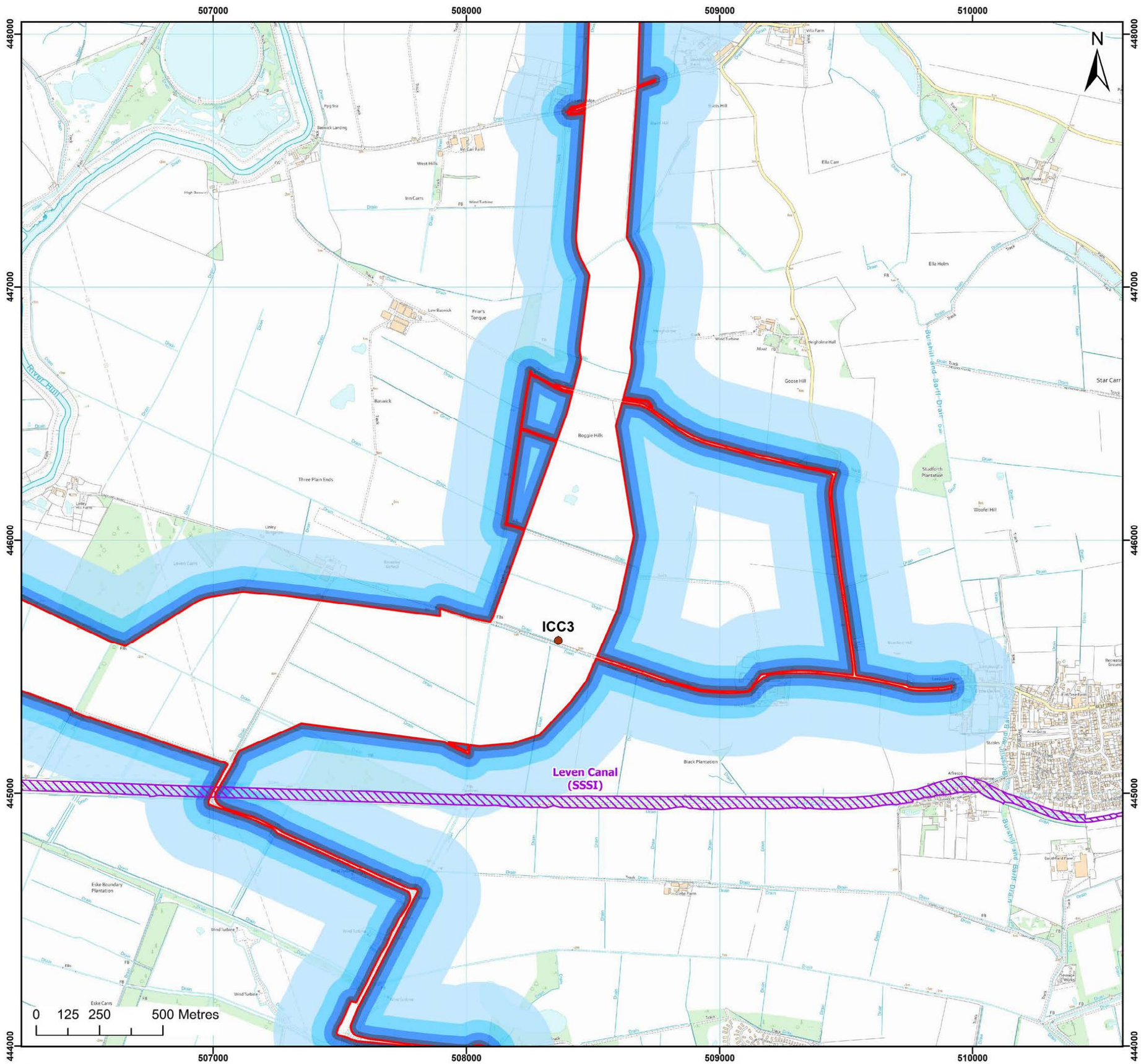

Legend:

- Onshore Development Area
- Site of Special Scientific Interest (SSSI)

Indicative Temporary Construction Compound Locations

- Intermediate Construction Compound for Onshore Export Cable Works

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Air Quality Construction Dust and Fine Particulate Matter Buffers - Sheet 5 of 12

Figure: 20.2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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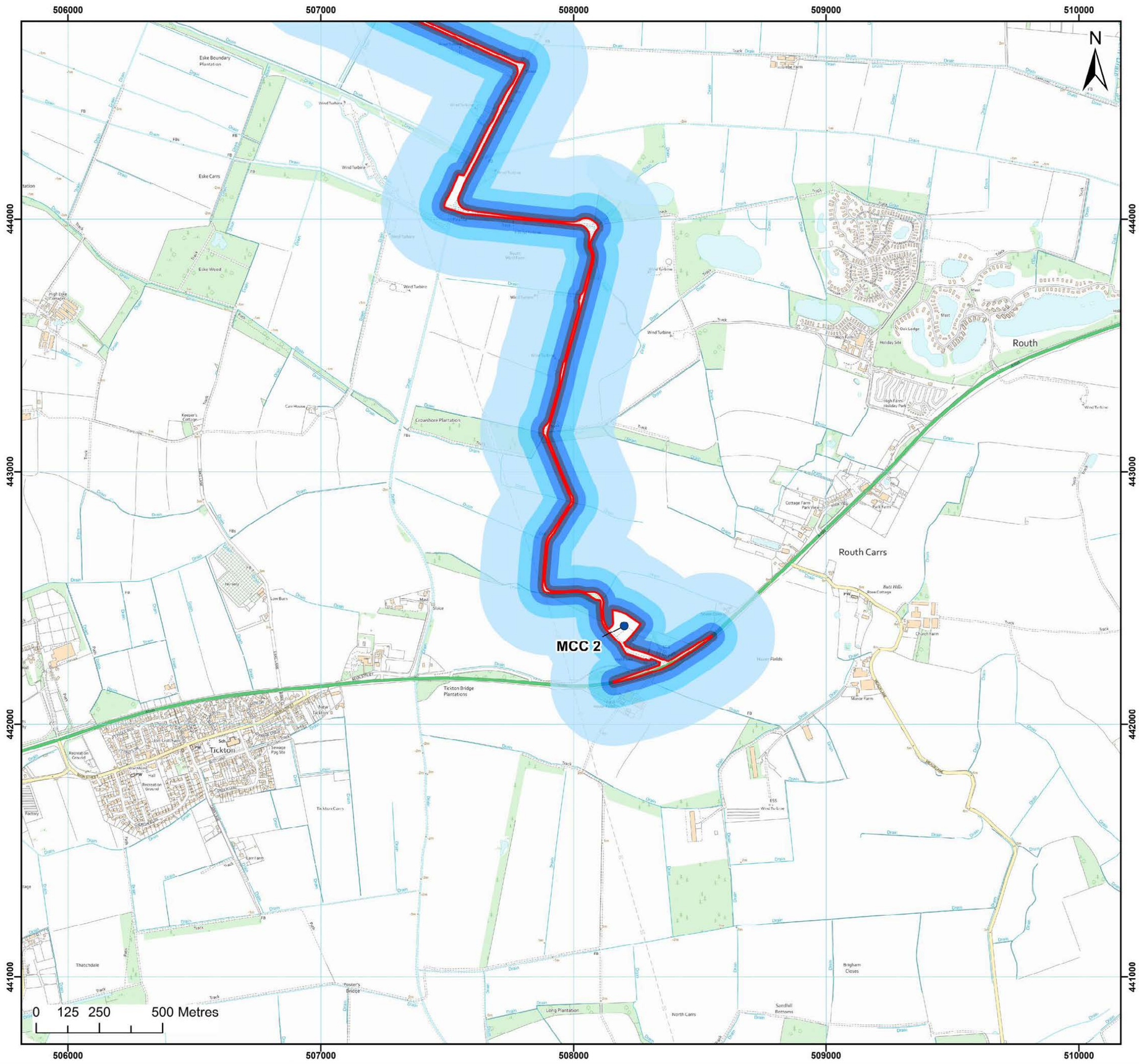

Legend:

Onshore Development Area

Indicative Temporary Construction Compound Locations

Main Construction Compound for Onshore Export Cable Works

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Air Quality Construction Dust and Fine Particulate Matter Buffers - Sheet 6 of 12

Figure: 20.2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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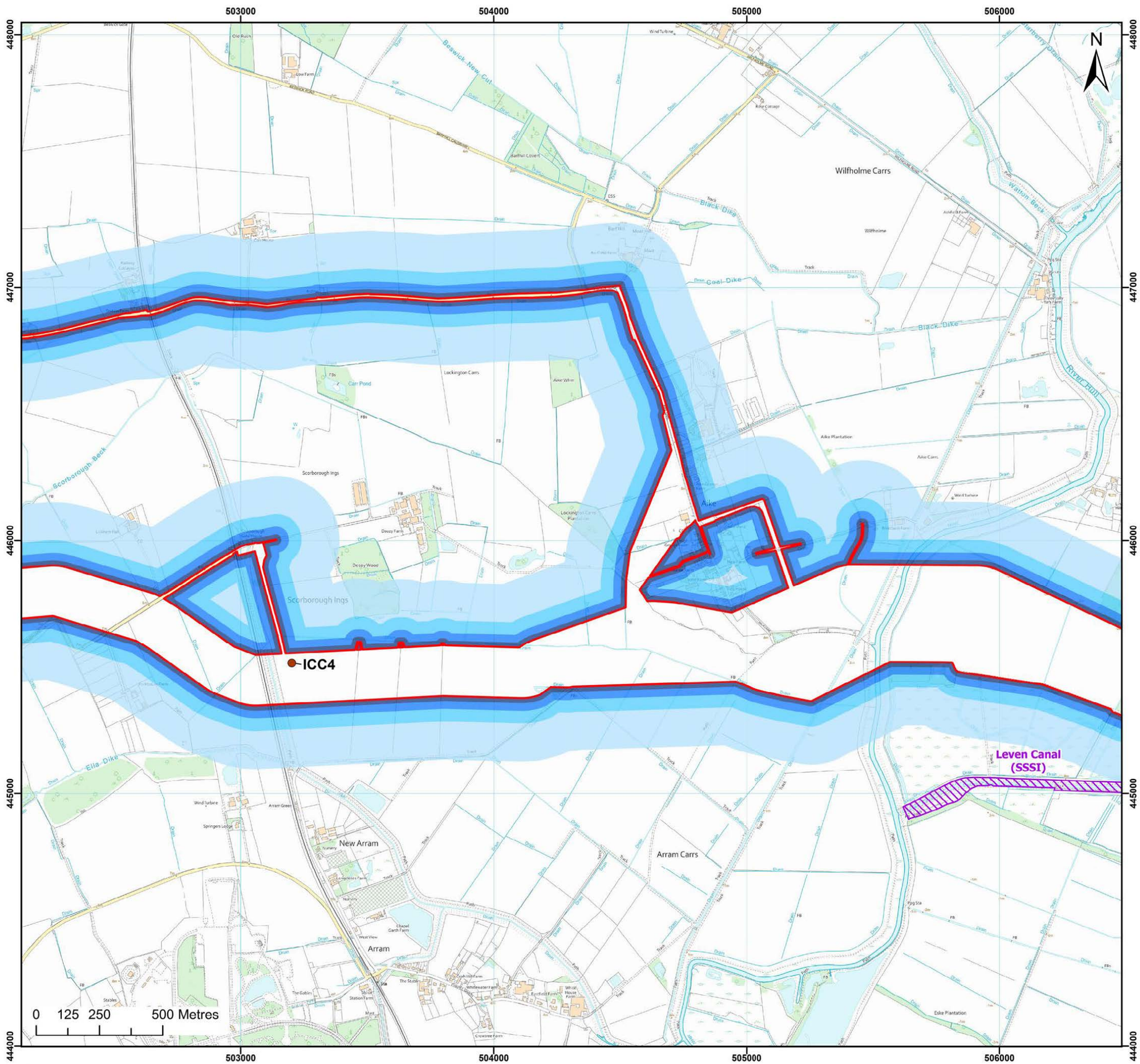

Legend:

- Onshore Development Area
- Site of Special Scientific Interest (SSSI)

Indicative Temporary Construction Compound Locations

- Intermediate Construction Compound for Onshore Export Cable Works

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Air Quality Construction Dust and Fine Particulate Matter Buffers - Sheet 7 of 12

Figure: 20.2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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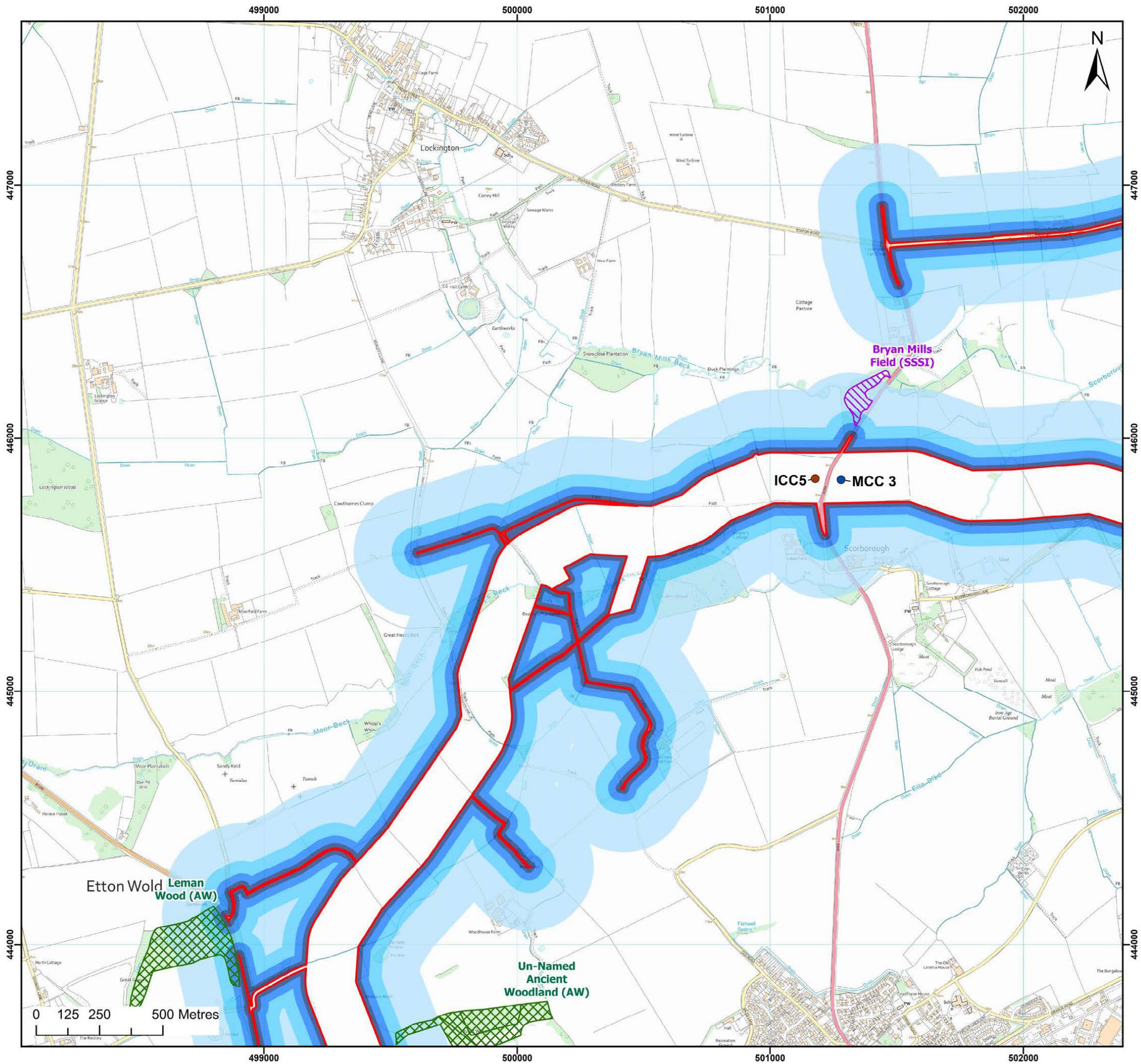

Legend:

- Onshore Development Area
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland

Indicative Temporary Construction Compound Locations

- Intermediate Construction Compound for Onshore Export Cable Works
- Main Construction Compound for Onshore Export Cable Works

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Air Quality Construction Dust and Fine Particulate Matter Buffers - Sheet 8 of 12

Figure: 20.2
Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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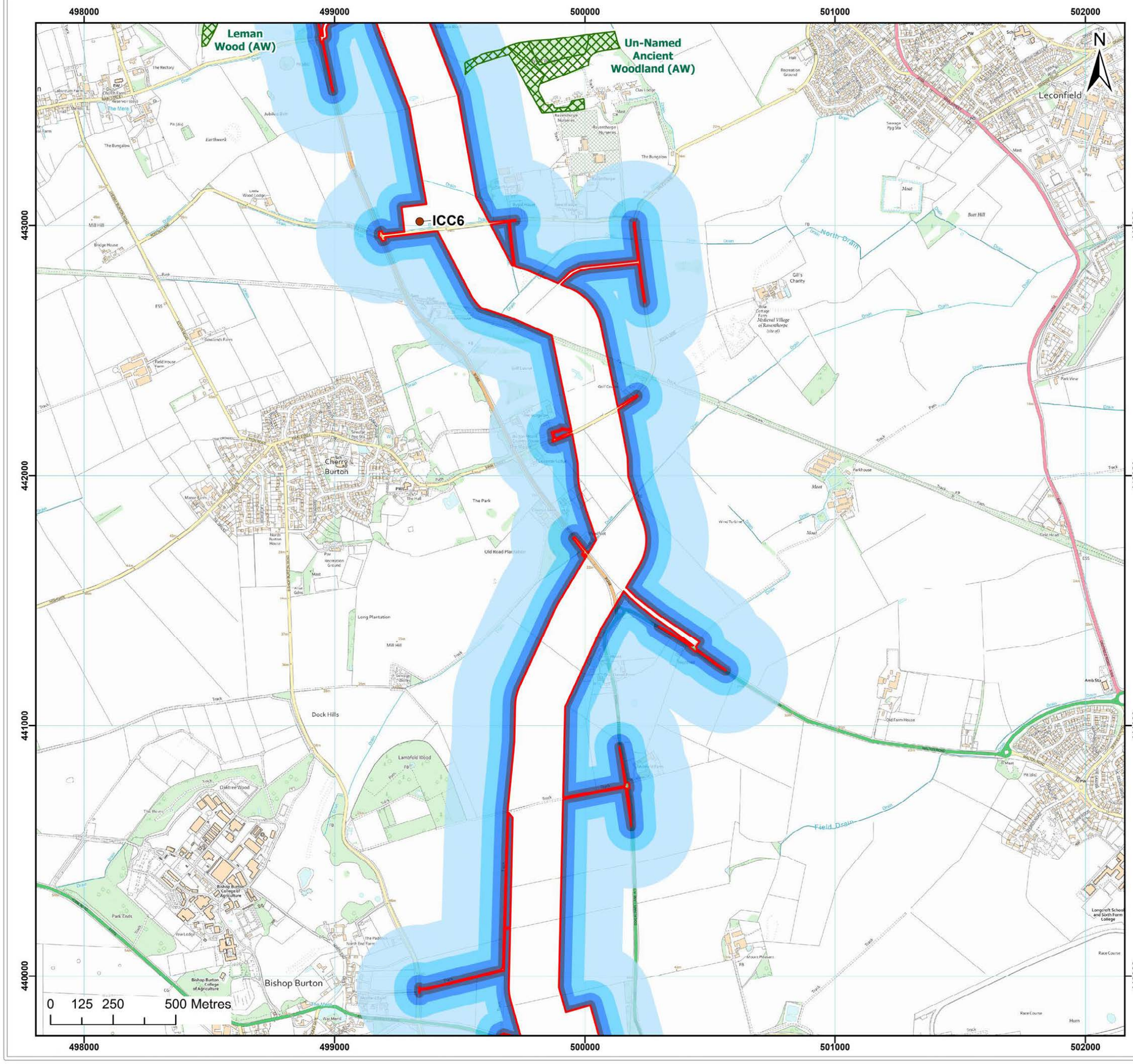

Legend:

- Onshore Development Area
- Ancient Woodland

Indicative Temporary Construction Compound Locations

- Intermediate Construction Compound for Onshore Export Cable Works

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Air Quality Construction Dust and Fine Particulate Matter Buffers - Sheet 9 of 12

Figure: 20.2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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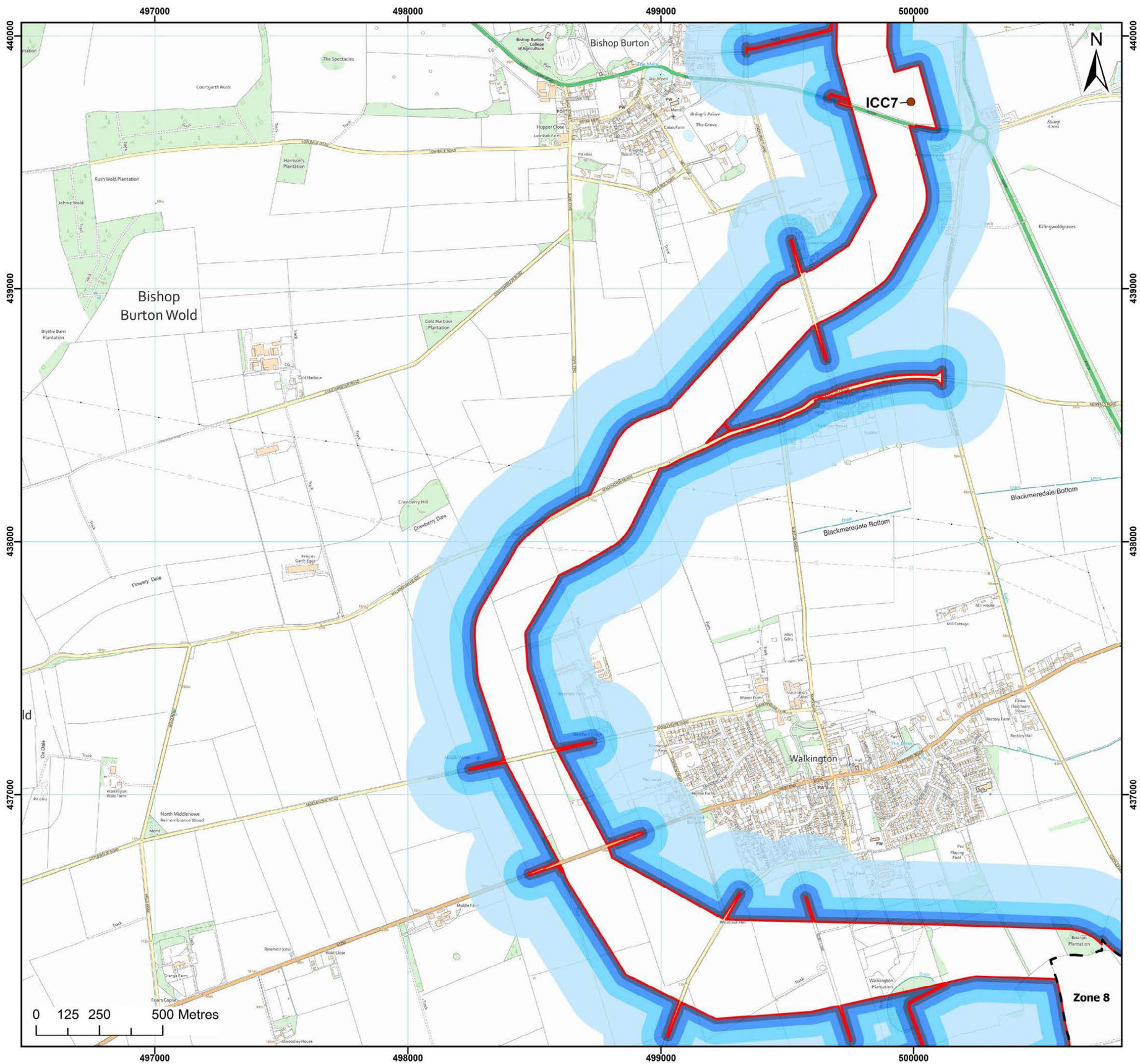

Legend:

- Onshore Development Area
- Onshore Converter Station Zone Options

Indicative Temporary Construction Compound Locations

- Intermediate Construction Compound for Onshore Export Cable Works

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Air Quality Construction Dust and Fine Particulate Matter Buffers - Sheet 10 of 12

Figure: 20.2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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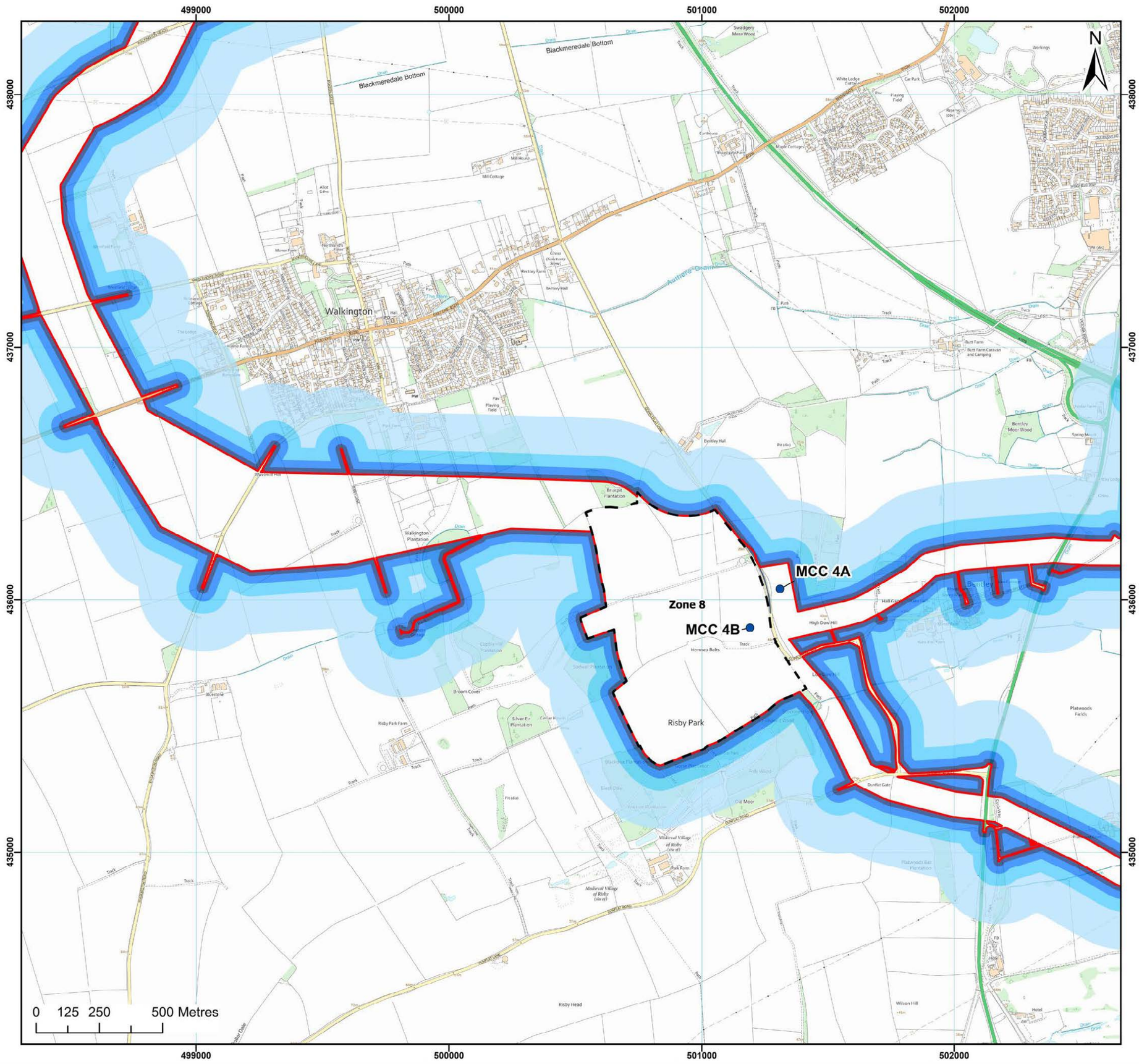

Legend:

- Onshore Development Area
- Onshore Converter Station Zone Options

Indicative Temporary Construction Compound Locations

- Main Construction Compound for Onshore Export Cable Works

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Air Quality Construction Dust and Fine Particulate Matter Buffers
- Sheet 11 of 12

Figure: 20.2
Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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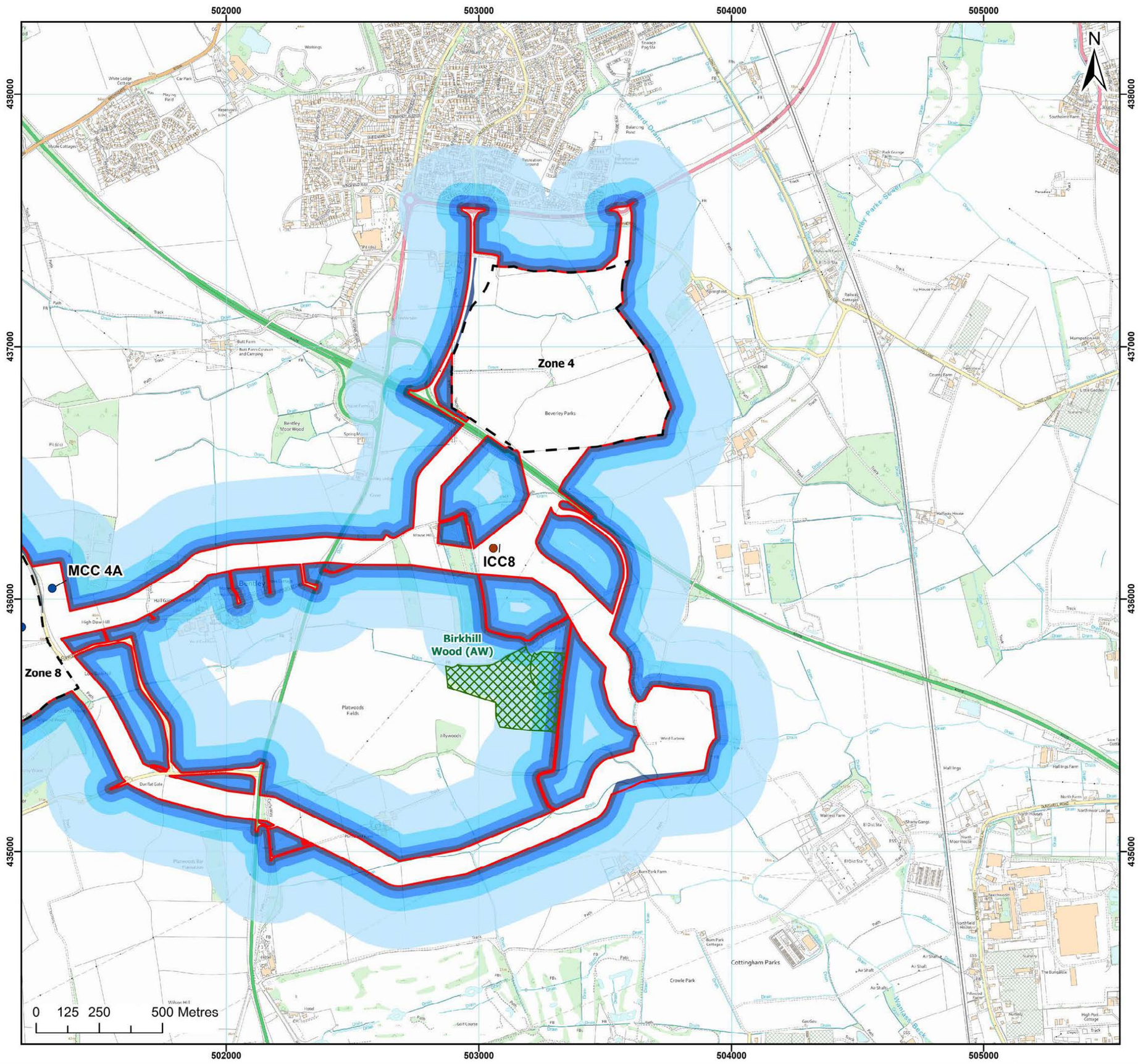

Legend:

- Onshore Development Area
- Onshore Converter Station Zone Options
- Ancient Woodland

Indicative Temporary Construction Compound Locations

- Intermediate Construction Compound for Onshore Export Cable Works
- Main Construction Compound for Onshore Export Cable Works

Construction Dust and Fine Particulate Matter Buffers (m)

- 20
- 50
- 100
- 250

Note: Two additional construction compounds for the Onshore Converter Station and Energy Storage Balancing Infrastructure will be required. These will be sited within the Onshore Converter Station zone.

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Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Air Quality Construction Dust and Fine Particulate Matter Buffers
- Sheet 12 of 12

Figure: 20.2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0338

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Co-ordinate system: British National Grid

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158. The temporary construction compounds located nearest to the highest density of human receptors is located north of Scorborough (MCC 3 and ICC 5). The location of maximum impact along the Onshore Development Area, i.e. dustiest activities and greatest number of receptors within close proximity to the construction works, was determined to be south of Beverley adjacent to the A164. Therefore, this area has been the focus of the construction dust assessment for human receptors along the Onshore Development Area, to provide a conservative assessment, as the combined sources of dust from both the temporary construction compounds and cable trenching activities is considered to represent the worst-case in terms of dust impact magnitude.

159. There are other areas along the Onshore Development Area where human receptors are present within 250m. 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 temporary construction compound). It is therefore anticipated that the sensitivity of these receptors would be equal to, or less than, those located at the landfall or the OCS zones (in **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment** provides further details on how the sensitivity of human receptors to dust soiling and human health impacts are determined).

20.6.1.3.1.2 Earthworks and Construction

160. There are between one to ten high sensitivity residential receptors located within 250m of the landfall construction compound (MCC 5).

161. There are between 10 to 100 high sensitivity residential receptors within 100m of the onshore ECC and associated temporary construction compounds.

162. Bramble Hill Farm is located within 120m of OCS Zone 4 and Bentley Hall is located 240m north of OCS Zone 8 at the closest point. Therefore, it has been conservatively assessed that there are between one and ten high sensitivity residential receptors within 50m of the OCS Zone 4 and between one and ten high sensitivity residential receptors within 250m of the OCS Zone 8 boundary.

20.6.1.3.1.3 Trackout

163. There are between one to ten high sensitivity residential receptors within 20m of roads used by construction vehicles up to 250m from the landfall construction compound (MCC 5).

164. There are between 10 to 100 high sensitivity residential receptors within 50m of roads to the south of Beverley used to access OCS Zone 4 and one to ten high sensitivity residential receptors within 20m of roads used by construction vehicles up to 250m from OCS Zone 8.

165. It should be noted that the mitigation measures identified to suppress dust emissions (see **Section 20.4.2**) would be applied across the onshore construction works and are applicable as mitigation not only for those receptors included within the assessment, but are applicable to receptors throughout the entire Onshore Development Area. As such, the assessment is considered to be robust.

20.6.1.3.2 Ecological Receptors

166. 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 20-25**, as well as the distance each ecological site is from the Onshore Development Area. **Figure 20-2** shows the locations of the ecological receptors listed in **Table 20-25**.

Table 20-25 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
Leeman Wood Ancient Woodland	10m from Onshore Development Area
Unnamed Ancient Woodland	60m from Onshore Development Area
Bryan Mills Field SSSI	45m from Onshore Development Area
Levan Canal SSSI	0m from Onshore Development Area
Greater Wash, SPA*	0m from Onshore Development Area
Withow Gap SSSI, Skipsea**	0m from Onshore Development Area

Note:

**Habitats sensitive to air quality impacts under the Greater Wash SPA designation include shifting coastal dunes and coastal stable dune grasslands (acid and calcareous type). However, none of these habitats are present within the SPA boundary at the landfall, according to Priority Habitat Inventory (Natural England, 2024). Therefore, this receptor is not anticipated to be sensitive to dust impacts and has been scoped out of the assessment.*

*** Withow Gap SSSI is a geological designation and not sensitive to air quality impacts. Therefore, this receptor has been scoped out of the assessment.*

20.6.1.3.3 Construction NRMM Emissions

20.6.1.3.3.1 Landfall

167. The closest human receptors to the landfall construction compound (MCC 5) are the farms and caravan park located off Hornsea Road, approximately 240m and 310m to the west and south, respectively. No ecological sites sensitive to air quality impacts are located within 200m of the landfall construction compound.

20.6.1.3.3.2 Onshore ECC

168. The closest human receptors to the works along the onshore ECC include the residential areas in the south of Beverley. The closest ecological receptors to the onshore ECC works, which may require NRMM (i.e. anywhere within the onshore ECC) are the Leven Canal SSSI and Birkhill Wood Ancient Woodland located 0m from the Onshore Development Area.

20.6.1.3.3.3 OCS Zone

169. The nearest human receptors to the OCS Zone 4 is Bramble Hill Farm, 120m to the east of Zone 4. There are no ecological receptors within 200m of OCS Zone 4.

170. The closest human receptors to OCS Zone 8 is Bentley Hall is located 240m north of OCS Zone 8 at the closest point. There are no ecological receptors within 200m of Zone 8.

20.6.1.3.4 Construction Road Vehicle Exhaust Emissions

20.6.1.3.4.1 Human Receptors

171. 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 were calculated at these locations.

172. The sensitive receptor locations are selected based on their proximity to road links affected by the Project (as identified within **Chapter 26 Traffic and Transport**) where the potential effect of project-generated traffic emissions on local air pollution would be most significant, including within the Hull AQMA. This includes residential dwellings, schools and hospitals. Sensitive receptor locations have been included at all roads which exceed the IAQM and EPUK screening criteria (IAQM and EPUK, 2017).

173. Receptors were 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. The sensitive receptor locations are detailed in **Volume 2, Appendix 20.4 Construction Road Vehicle Exhaust Emissions Assessment – Receptor Locations** and shown on **Figure 20-3**.

20.6.1.3.4.2 Ecological Receptors

174. A number of designated ecological sites are located within 200m of roads which are anticipated to experience increases in project-related traffic flows, which exceed the criteria in **Table 20-11**.

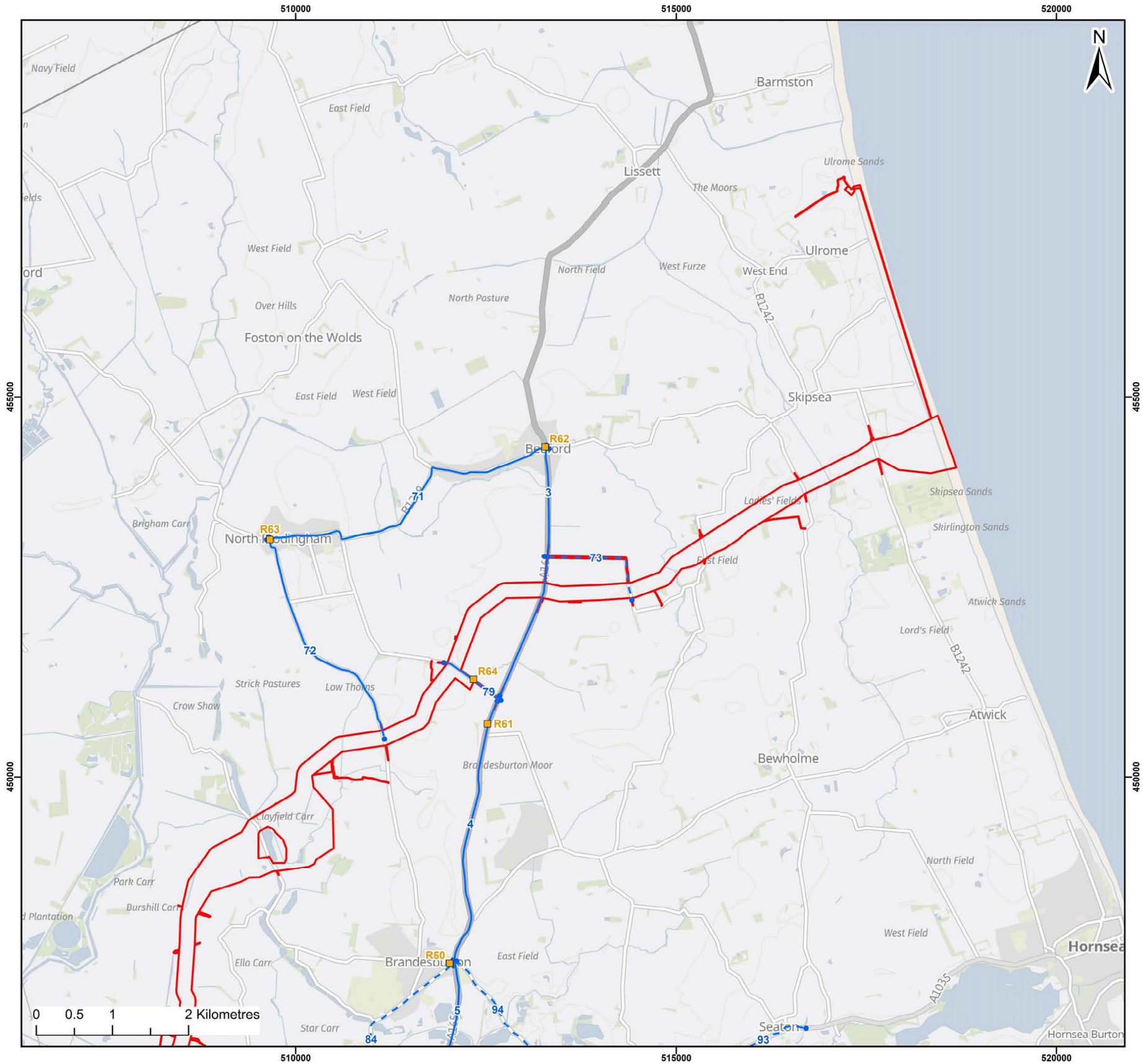
175. The APIS website (CEH, 2024) has been consulted to identify any habitats or features of these designated sites that are sensitive to nutrient nitrogen and acid deposition. Where sensitive habitats or features were found, the Critical Loads for nutrient nitrogen and acid deposition were obtained. A full list of the designated ecological sites and associated Critical Level and Load values that were considered is presented in **Table 20-26**. The most sensitive habitat types were included to provide a conservative assessment. LNR have been assessed against Critical Levels only, as Critical Loads are not provided for LNR on the APIS website (CEH, 2024).

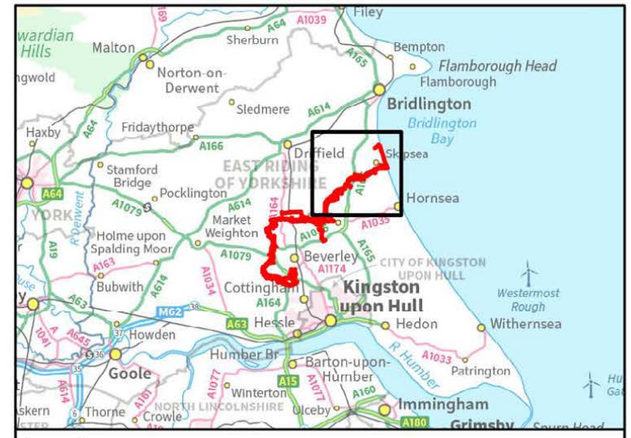
176. Receptors have been included in the dispersion model as transects through designated sites at 10m intervals up to 200m from the edge of the road, in line with Design Manual for Roads and Bridges guidance (National Highways, 2024). Receptors have been modelled at a height of 0m (i.e. at ground level). The receptor transects for designated salt marsh, as identified by Natural England's Priority Habitats Inventory, (Natural England, 2024) south of the A63 have been modelled at 5m intervals to provide greater resolution. The designated ecological sites are listed in **Table 20.4-2** presented in **Volume 2**, **Appendix 20.4 Construction Road Vehicle Exhaust Emissions Assessment – Receptor Locations** and also shown on **Figure 20-4**. Modelled receptor transect locations are shown on **Figure 20-5**.

20.6.1.3.5 Construction Vessel Exhaust Emissions - Ecological Receptors

177. Vessel movements associated with the Project during construction are only likely to be near to onshore sensitive ecological receptors where they are:

- Used during the installation of landfall infrastructure (e.g. pull-in of offshore export cables from the exit pits through to the TJB located onshore);
- Exiting or entering a port in the Humber and travelling along the Humber Estuary to deliver construction materials to support onshore construction activities; and
- Existing or entering an offshore construction base port(s). At this stage, no decision has been made regarding which port(s) would be used for the Project's offshore construction activities. A decision on the offshore construction base port(s) would not be made until post DCO determination. The closest ecological receptor will therefore not be confirmed until post DCO determination.





Legend:

- Onshore Development Area
- Roads Screened In for Detailed Assessment of Human Receptors (IAQM and EPUK, 2017)
- Roads Screened Out from Detailed Assessment of Human Receptors (IAQM and EPUK, 2017)
- Human Receptor Location

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Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Construction Road Vehicle Exhaust Emissions - Human Receptor Locations - Sheet 1 of 5

Figure: 20.3

Drawing No: PC6250-RHD-XX-ON-DR-GS-0339

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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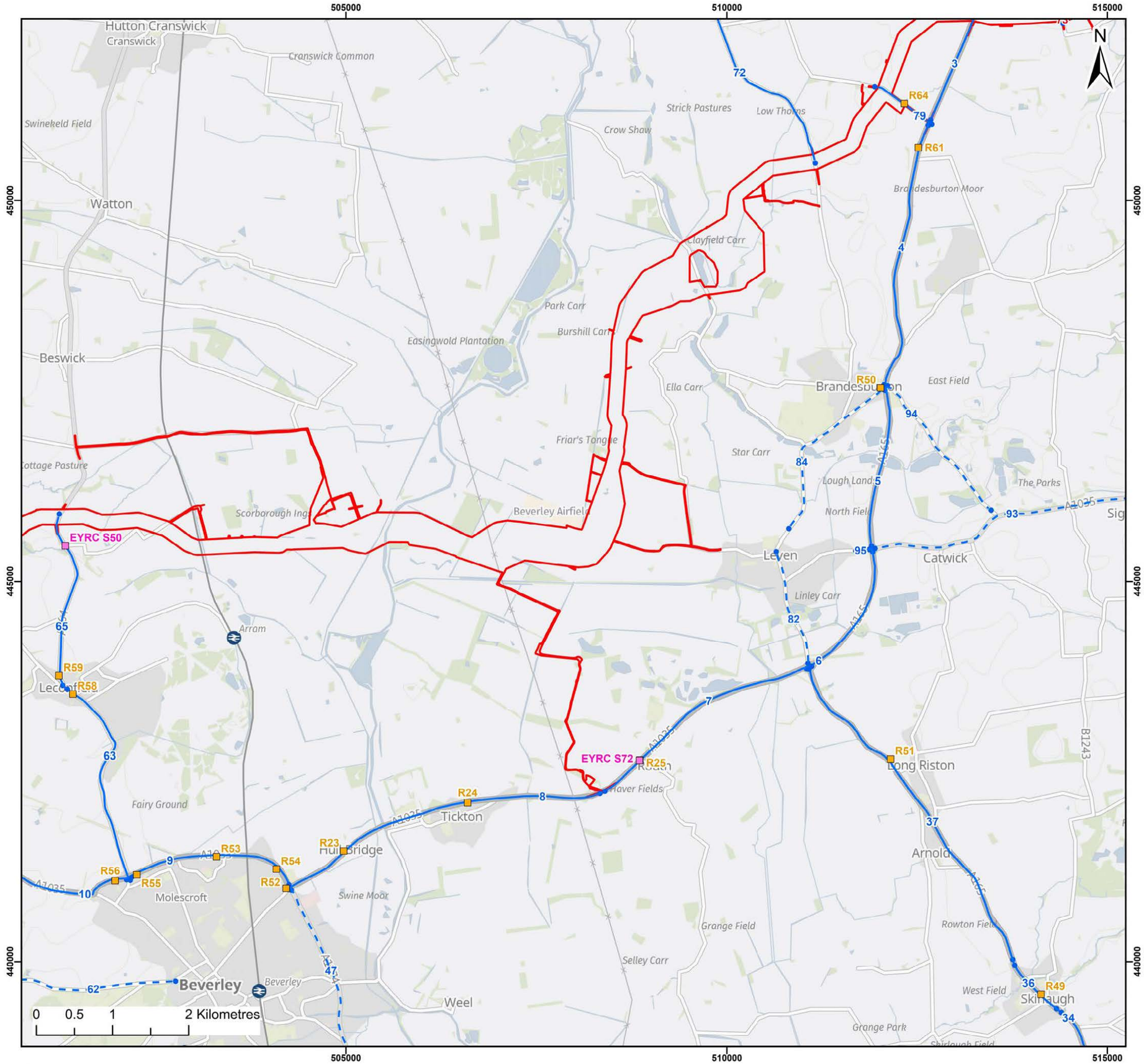

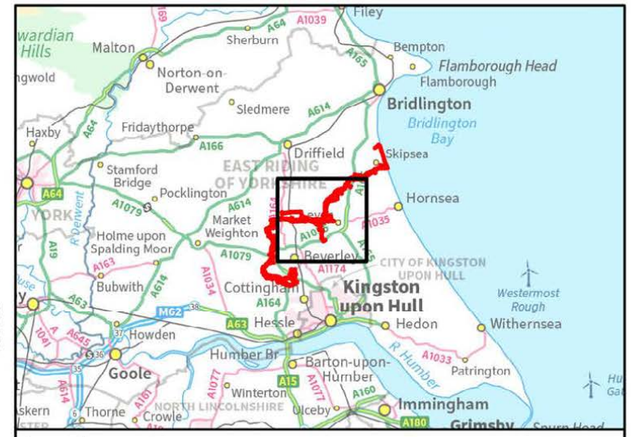

Legend:

- Onshore Development Area
- Roads Screened In for Detailed Assessment of Human Receptors (IAQM and EPUK, 2017)
- Roads Screened Out from Detailed Assessment of Human Receptors (IAQM and EPUK, 2017)
- Human Receptor Location
- Diffusion Tube Verification Site

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Construction Road Vehicle Exhaust Emissions - Human Receptor Locations - Sheet 2 of 5

Figure:	Drawing No:
20.3	PC6250-RHD-XX-ON-DR-GS-0339

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Co-ordinate system: British National Grid

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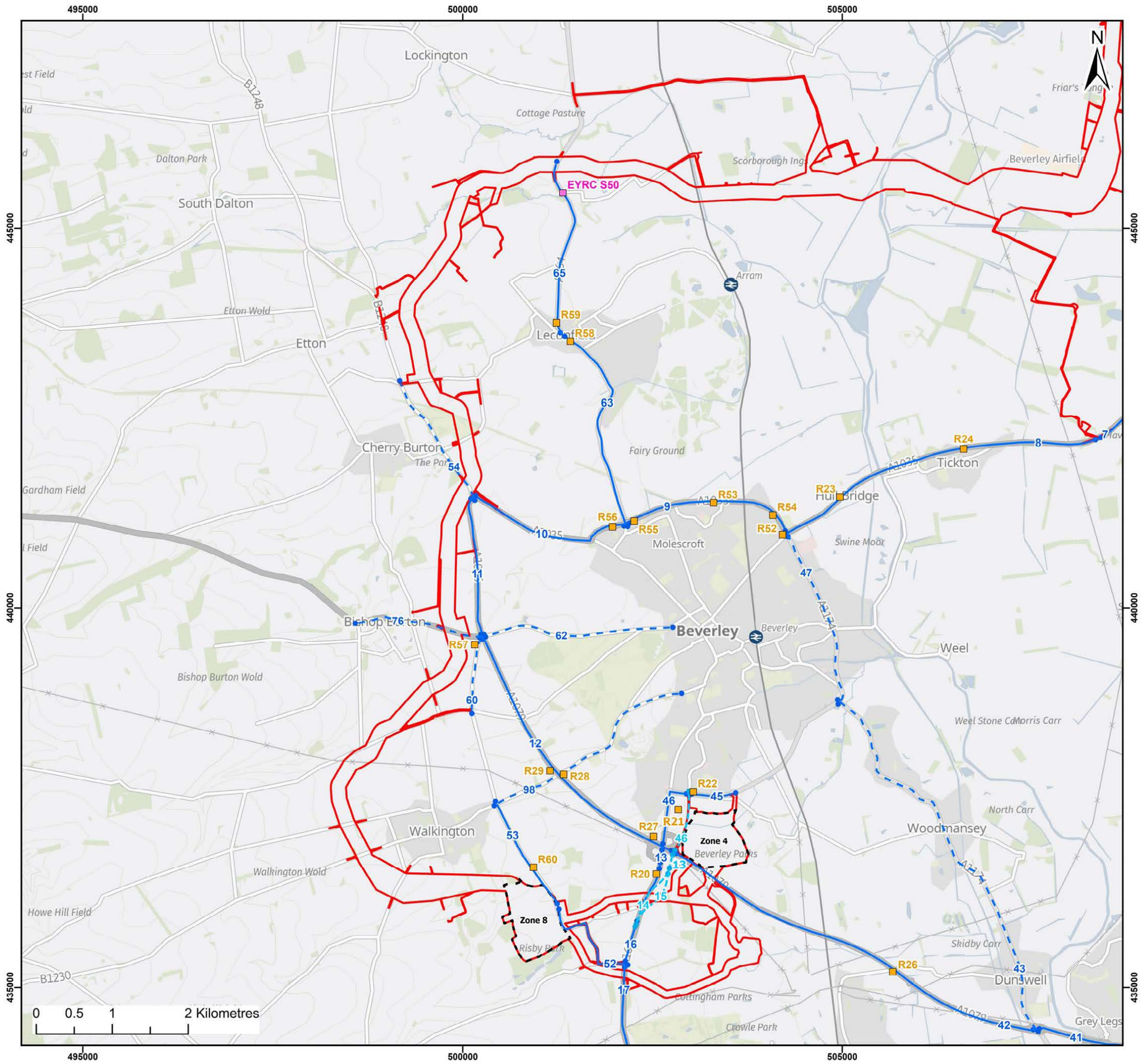

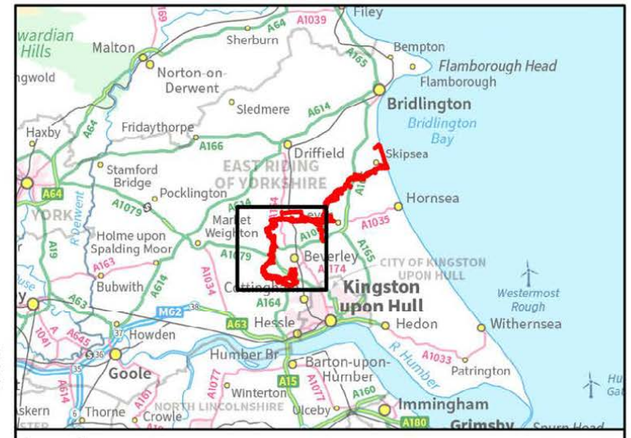

Legend:

- Onshore Development Area
- Onshore Converter Station Zone Options
- Roads Screened In for Detailed Assessment of Human Receptors (IAQM and EPUK, 2017)
- Roads Screened Out from Detailed Assessment of Human Receptors (IAQM and EPUK, 2017)
- Updated A164 Jocks Lodge Road Network
- Human Receptor Location
- Diffusion Tube Verification Site

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Construction Road Vehicle Exhaust Emissions - Human Receptor Locations - Sheet 3 of 5

Figure: 20.3

Drawing No: PC6250-RHD-XX-ON-DR-GS-0339

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Co-ordinate system: British National Grid

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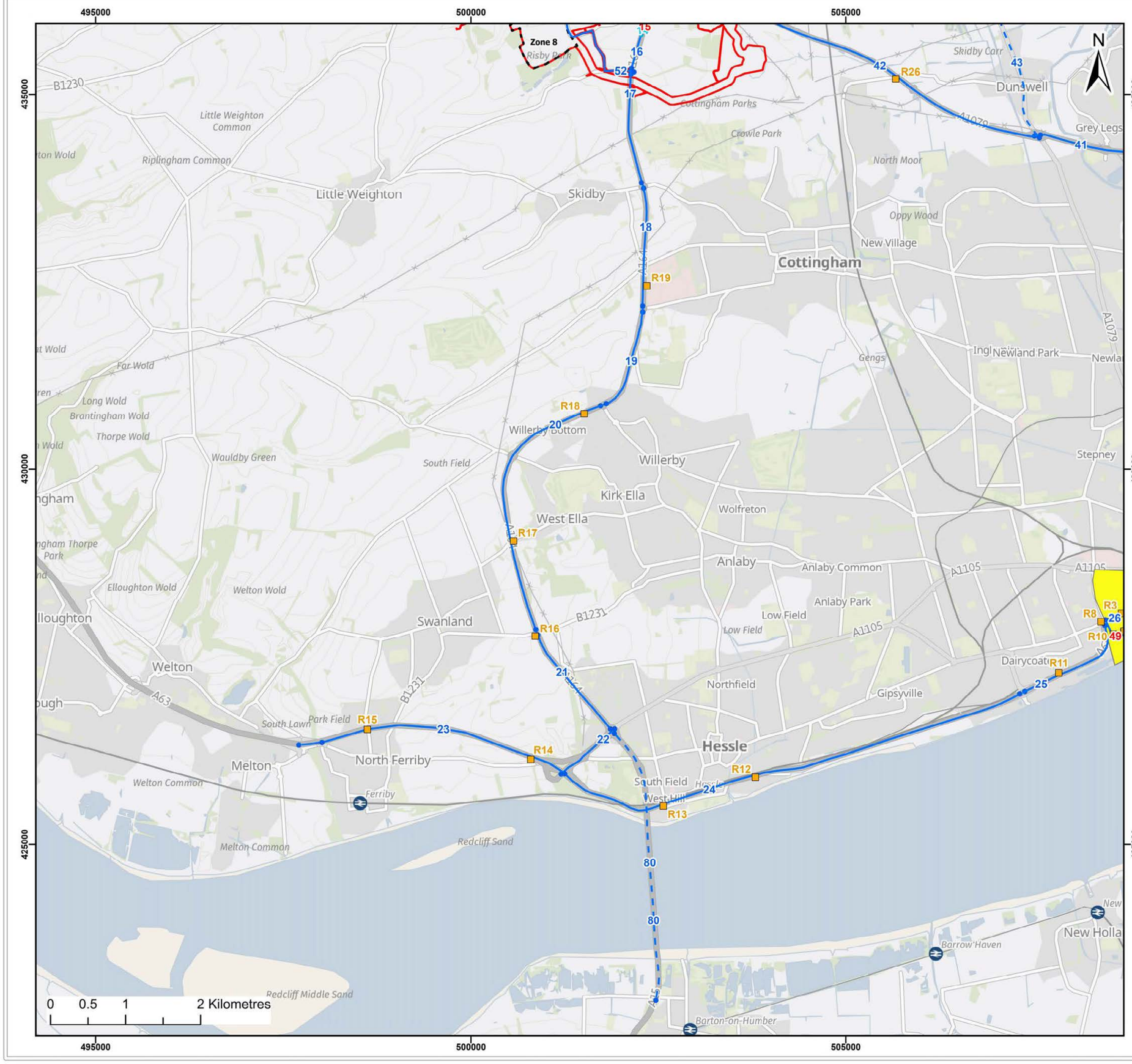

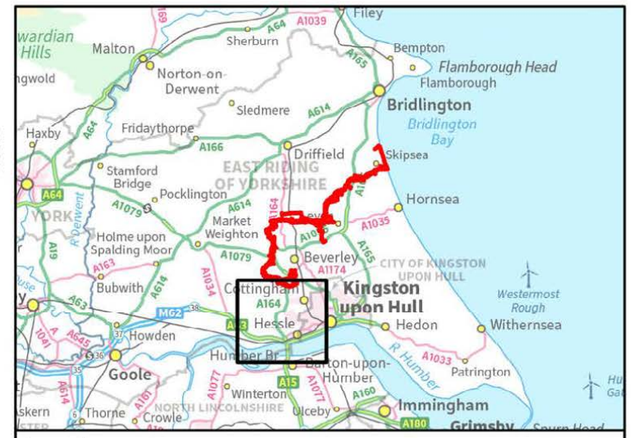

Legend:

- Onshore Development Area
- Onshore Converter Station Zone Options
- Roads Screened In for Detailed Assessment of Human Receptors (IAQM and EPUK, 2017)
- Roads Screened Out from Detailed Assessment of Human Receptors (IAQM and EPUK, 2017)
- Updated A164 Jocks Lodge Road Network
- Air Quality Management Area (AQMA)
- Human Receptor Location

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Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Construction Road Vehicle Exhaust Emissions -
Human Receptor Locations
- Sheet 4 of 5

Figure: 20.3

Drawing No: PC6250-RHD-XX-ON-DR-GS-0339

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Co-ordinate system: British National Grid

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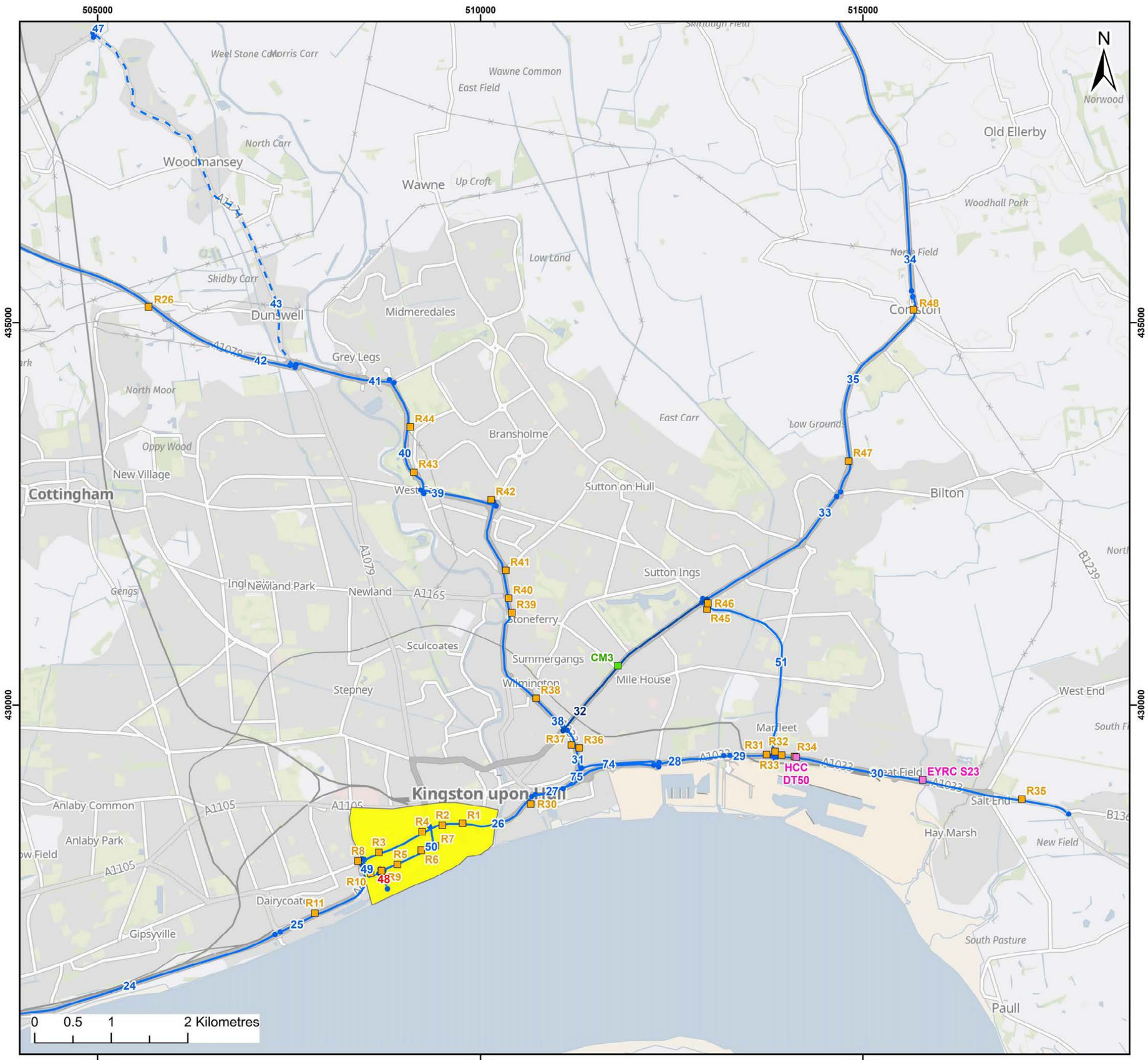

Legend:

- Onshore Development Area
- Roads Screened In for Detailed Assessment of Human Receptors (IAQM and EPUK, 2017)
- Roads Screened Out from Detailed Assessment of Human Receptors (IAQM and EPUK, 2017)
- Road Modelled for Model Verification
- Air Quality Management Area (AQMA)
- Human Receptor Location
- Diffusion Tube Verification Site
- Automatic Monitoring Verification Site

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Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Construction Road Vehicle Exhaust Emissions - Human Receptor Locations - Sheet 5 of 5

Figure:	Drawing No:
20.3	PC6250-RHD-XX-ON-DR-GS-0339

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Co-ordinate system: British National Grid

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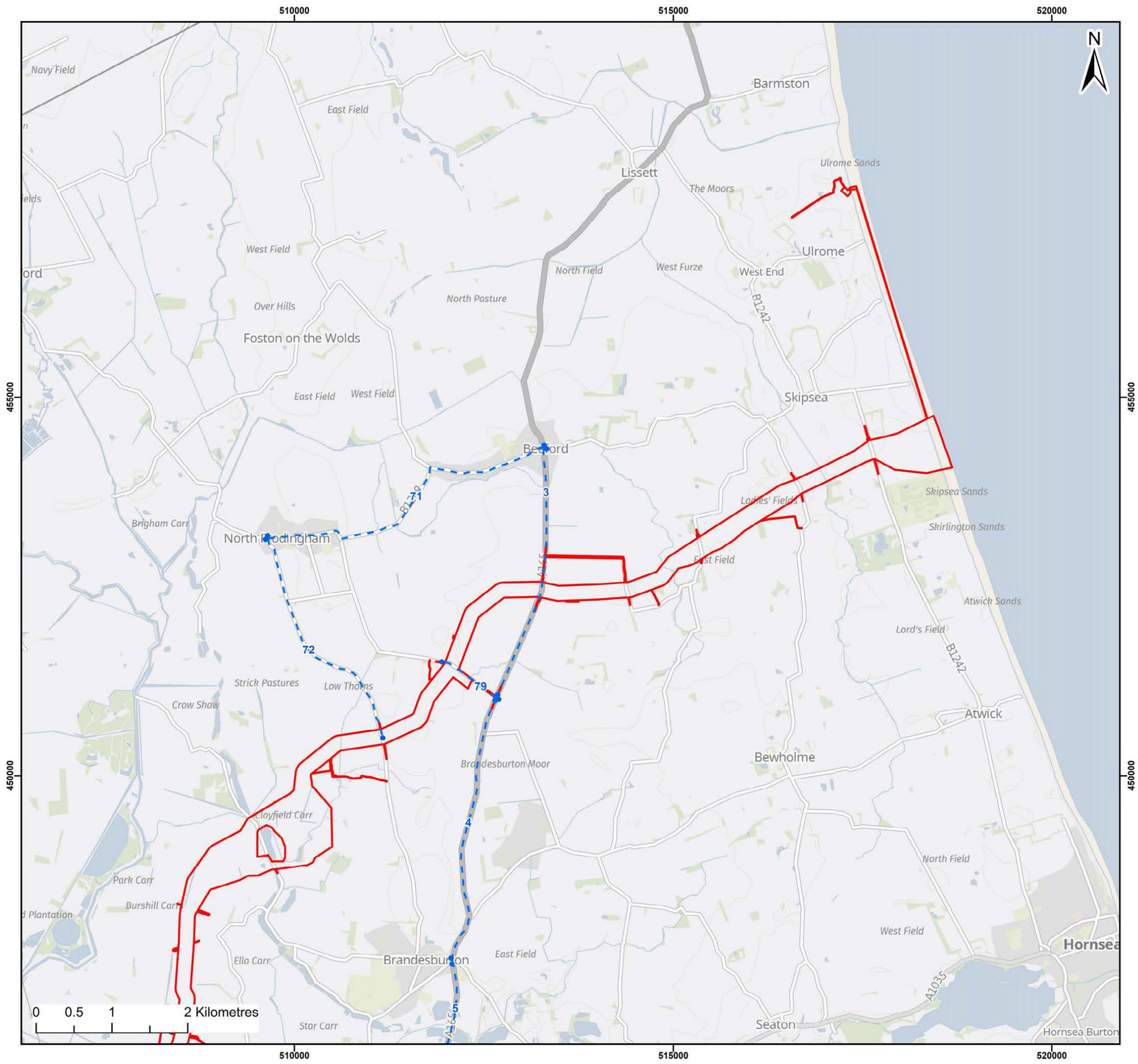

Legend:

- Onshore Development Area
- Roads Screened Out from Detailed Assessment of Ecological Receptors (Natural England, 2018)

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Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Construction Road Vehicle Exhaust Emissions - Ecological Receptor Locations
- Sheet 1 of 5

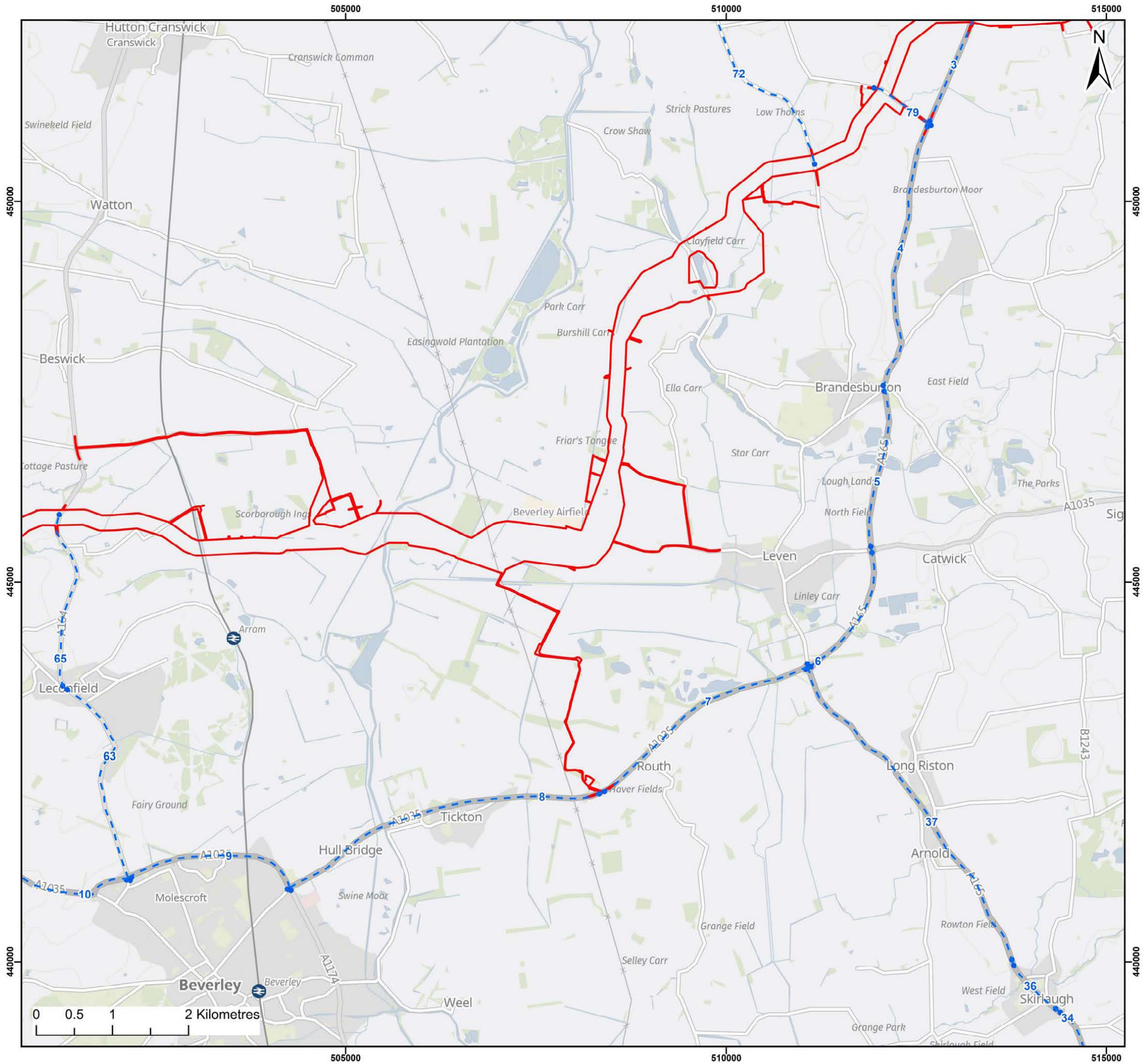
Figure: 20.4

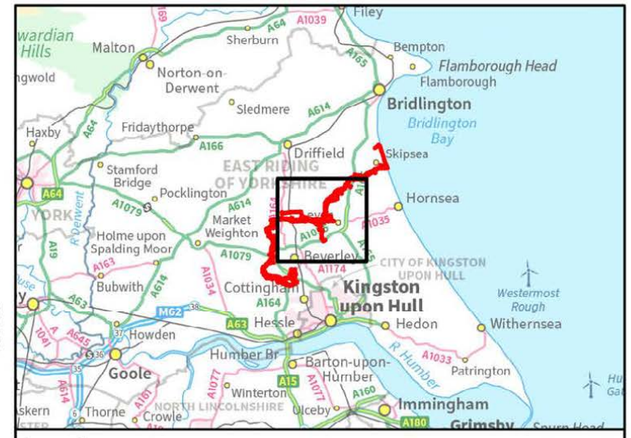
Drawing No: PC6250-RHD-XX-ON-DR-GS-0340

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	19/05/2025	JH	DH	A3	1:50,000
01	16/12/2024	FC	DH	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Development Area
- Roads Screened Out from Detailed Assessment of Ecological Receptors (Natural England, 2018)

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Construction Road Vehicle Exhaust Emissions - Ecological Receptor Locations - Sheet 2 of 5

Figure:	Drawing No:
20.4	PC6250-RHD-XX-ON-DR-GS-0340

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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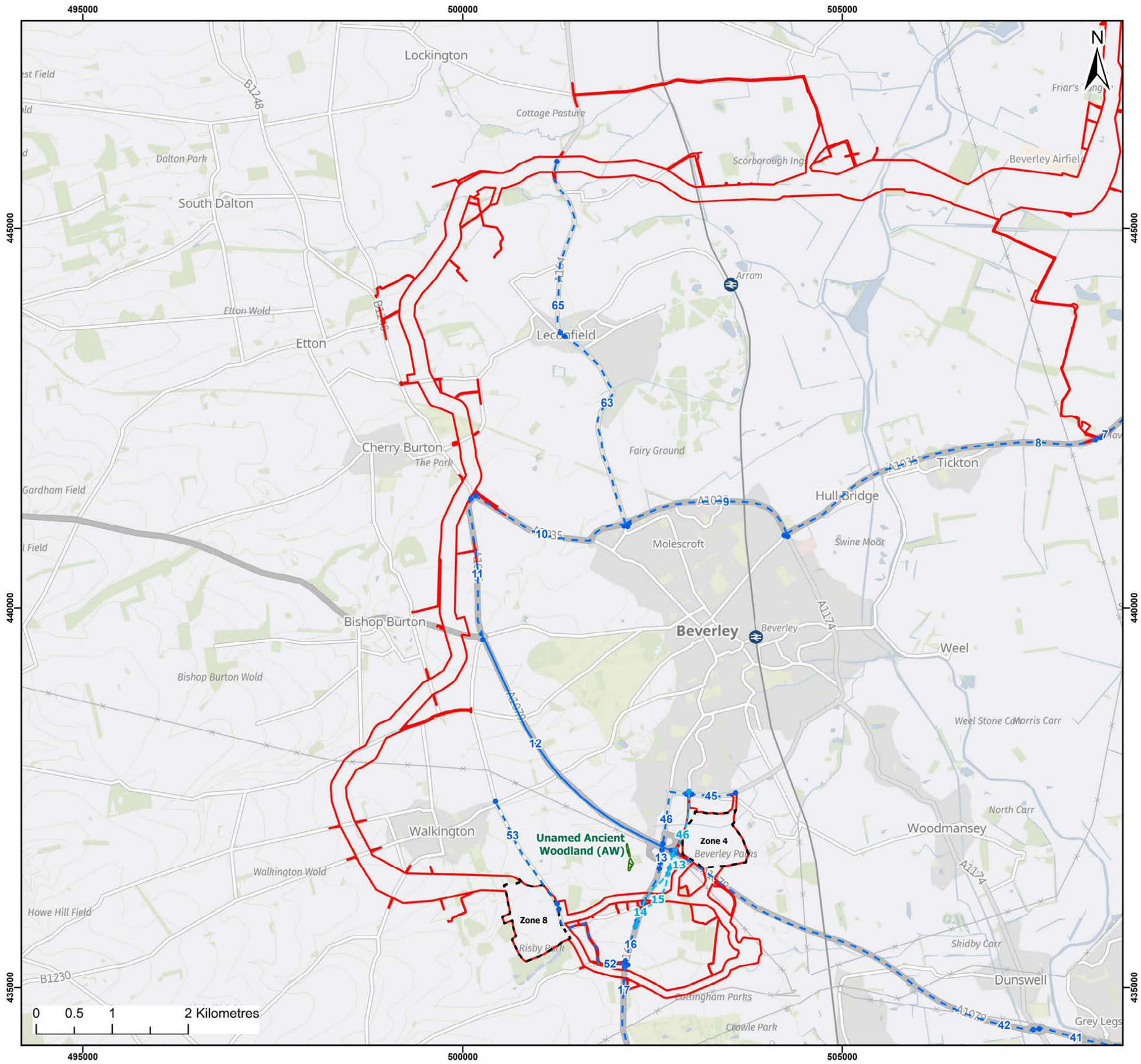

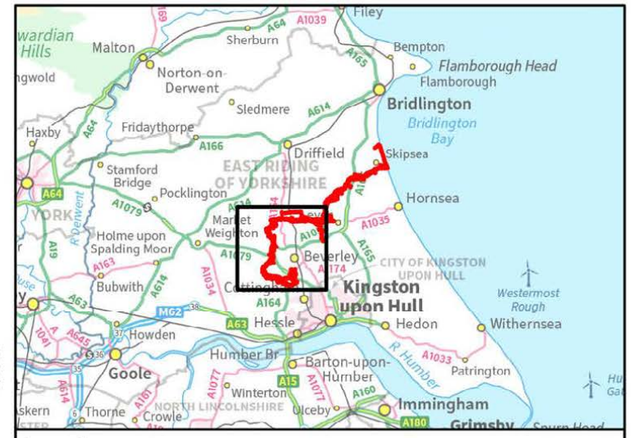

Legend:

- Onshore Development Area
- Onshore Converter Station Zone Options
- Roads Screened In for Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Roads Screened Out from Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Updated A164 Jocks Lodge Road Network
- Ancient Woodland

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Construction Road Vehicle Exhaust Emissions - Ecological Receptor Locations - Sheet 3 of 5

Figure: 20.4

Drawing No: PC6250-RHD-XX-ON-DR-GS-0340

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	19/05/2025	JH	DH	A3	1:50,000
01	16/12/2024	FC	DH	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor

Legend:

- Onshore Development Area
- Onshore Converter Station Zone Options
- Roads Screened In for Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Roads Screened Out from Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Updated A164 Jocks Lodge Road Network
- Air Quality Management Area (AQMA)
- Site of Special Scientific Interest (SSSI)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar
- Local Nature Reserve (LNR)

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Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Construction Road Vehicle Exhaust Emissions - Ecological Receptor Locations
- Sheet 4 of 5

Figure: 20.4

Drawing No: PC6250-RHD-XX-ON-DR-GS-0340

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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01	16/12/2024	FC	DH	A3	1:50,000

Co-ordinate system: British National Grid

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505000 510000 515000

435000 430000

N

Weel Stone Cr Morris Carr
Wawne Common
East Field
Norwood
Old Ellerby
North Carr
Woodmansey
Wawne
Up Croft
A1174
Woodhall Park
Skidby Carr
Low Land
North Field
Dunswell
Midmeredales
Coniston
Grey Legs
A1079
North Moor
East Carr
Low Grounds
Bransholme
Oppy Wood
New Village
Cottingham
Sutton on Hull
Bilton
Gengs
Ingl
Newland Park
Newland
A1165
Sutton Ings
Stoneferry
Sculcoates
Summergangs
Wilmington
Mile House
Stepney
West End
Marfleet
Kingston upon Hull
Anlaby Common
Anlaby Park
Dairycoates
Gipsyville
Salt End
Hay Marsh
New Field
South Pasture
Paull
B1239
B1230

Humber Estuary (Ramsar)
Humber Estuary (SSSI)
Humber Estuary (SAC)
Humber Estuary (SPA)

42 41 40 39 34 35 33 32 51 38 31 74 28 29 30 75 27 26 49 50 48 25 24

0 0.5 1 2 Kilometres

Legend:

- Roads Screened In for Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Roads Screened Out from Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Air Quality Management Area (AQMA)
- Site of Special Scientific Interest (SSSI)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Construction Road Vehicle Exhaust Emissions - Ecological Receptor Locations - Sheet 5 of 5

Figure: 20.4

Drawing No: PC6250-RHD-XX-ON-DR-GS-0340

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	19/05/2025	JH	DH	A3	1:50,000
01	16/12/2024	FC	DH	A3	1:50,000

Co-ordinate system: British National Grid

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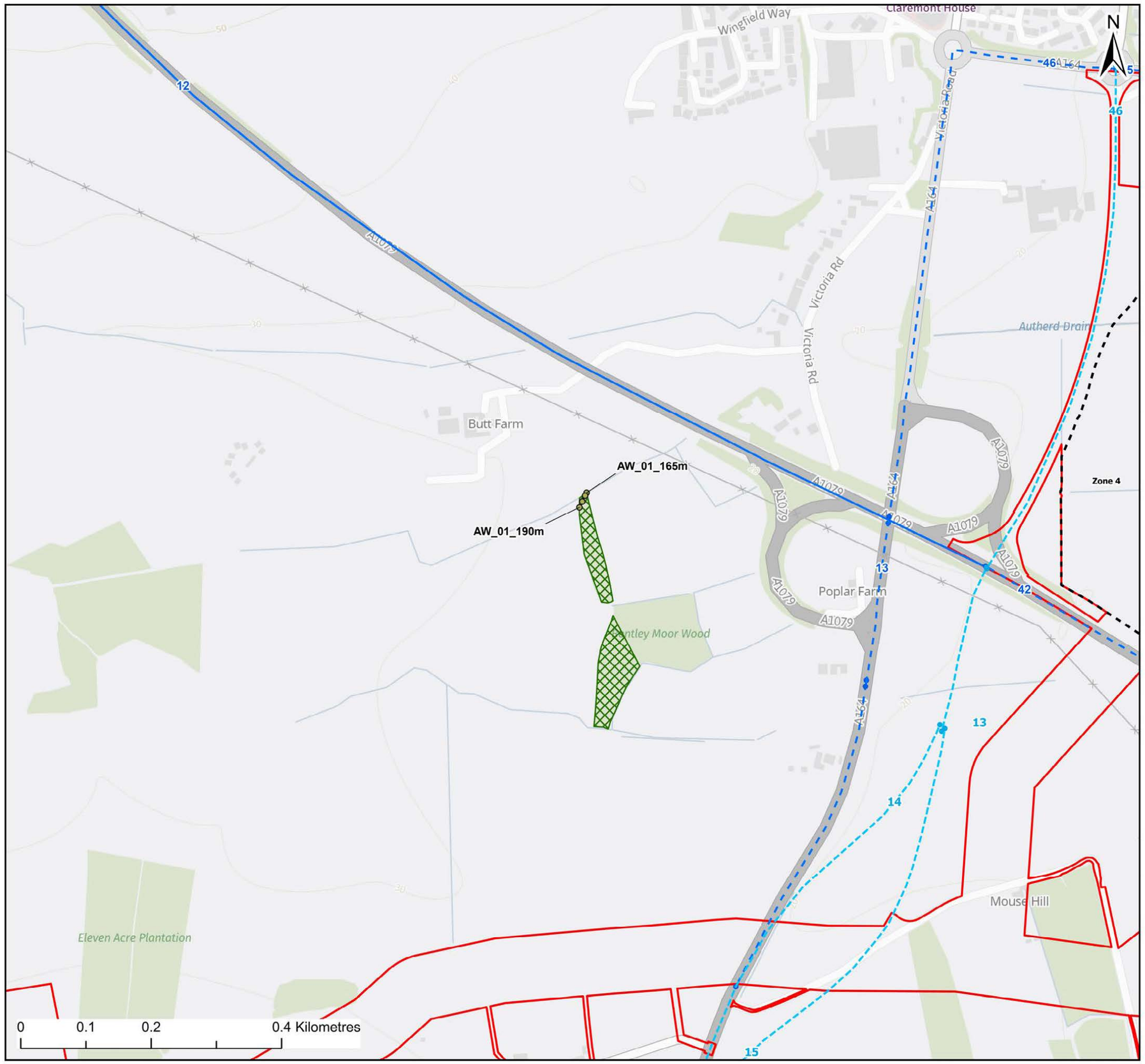

Legend:

- Onshore Development Area
- Modelled Ecological Receptor Transects
- Onshore Converter Station Zone Options
- Roads Screened In for Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Roads Screened Out from Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Updated A164 Jocks Lodge Road Network
- Ancient Woodland

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Construction Road Vehicle Exhaust Emissions - Modelled Ecological Receptor Transects - Sheet 1 of 5

Figure: 20.5

Drawing No: PC6250-RHD-XX-ON-DR-GS-0340

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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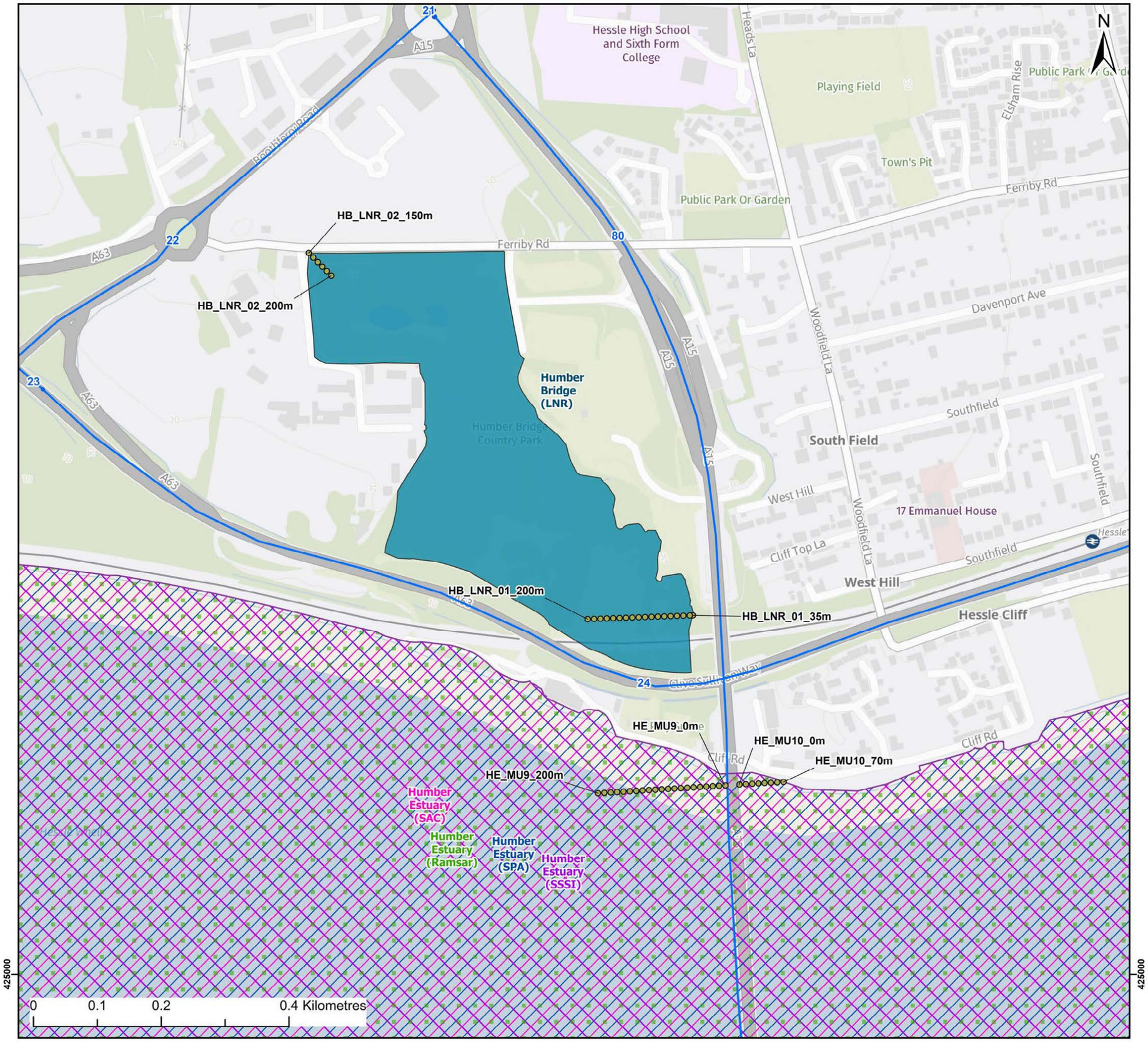

Legend:

- Modelled Ecological Receptor Transects
- Roads Screened In for Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Roads Screened Out from Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Site of Special Scientific Interest (SSSI)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar
- Local Nature Reserve (LNR)

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Construction Road Vehicle Exhaust Emissions - Modelled Ecological Receptor Transects - Sheet 2 of 5

Figure: 20.5

Drawing No: PC6250-RHD-XX-ON-DR-GS-0340

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	05/02/2025	JH	DH	A3	1:6,000

Co-ordinate system: British National Grid

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Legend:

- Modelled Ecological Receptor Transects
- Roads Screened In for Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Site of Special Scientific Interest (SSSI)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar
- Saltmarsh Priority Habitat

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Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Construction Road Vehicle Exhaust Emissions - Modelled Ecological Receptor Transects - Sheet 3 of 5

Figure: 20.5

Drawing No: PC6250-RHD-XX-ON-DR-GS-0340

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	05/02/2025	JH	DH	A3	1:6,000

Co-ordinate system: British National Grid

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505000

Gipsyville
Playing Field
Public Park Or Garden
Playing Field
Benedict Rd
Tilbury Rd
Campion Ave
Graham Ave
St Nicholas Ave
B1401
Hessle Rd
Oribi Ct
Impala Way
Forester Way
Santolina Way
Summergroves Way
Henry Boot Way
Priory Way
A63
Clive Sullivan Way

HE_MU1_10m
HE_MU2_5m
HE_SM3_10m
HE_MU1_130m
HE_MU2_110m
HE_SM4_8m
HE_MU3_70m
HE_MU1_200m
HE_MU2_200m
HE_MU4_60m
HE_SM5_14m
HE_MU3_200m
HE_MU5_60m
HE_MU6_200m
HE_SM6_35m
HE_MU6_75m
HE_MU5_200m
HE_MU6_200m

Humber Estuary (SAC)
Humber Estuary (Ramsar)
Humber Estuary (SSSI)
Humber Estuary (SPA)

N

0 0.1 0.2 0.4 Kilometres

505000

Legend:

- Modelled Ecological Receptor Transects
- Roads Screened In for Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Site of Special Scientific Interest (SSSI)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar
- Saltmarsh Priority Habitat

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Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Construction Road Vehicle Exhaust Emissions - Modelled Ecological Receptor Transects - Sheet 4 of 5

Figure: 20.5
Drawing No: PC6250-RHD-XX-ON-DR-GS-0340

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	05/02/2025	JH	DH	A3	1:6,000

Co-ordinate system: British National Grid

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510000

Academy
Albion St
Bond St
George St
Dock St
West St
South St
Paragon St
Carr La
Hull School of Art and Design
Blaydes House
Clarence St
A1165
Hedon Rd
Guildhall Rd
Kingston upon Hull
Alfred Gelder St
Roger Millward Way
27
Tower St
Citadel Way
A63
Victoria Park
Bowling G
Play Space
South Bridge Rd
Garrison Side
Victoria Dock Primary School
Plimsoll Way
Pilots Way
26
50
HE_MU11_77m
HE_MU11_120m
Humber Estuary (SSSI)
Humber Estuary (SPA)
Humber Estuary (Ramsar)
Humber Estuary (SAC)
N
0 0.1 0.2 0.4 Kilometres

Legend:

- Modelled Ecological Receptor Transects
- Roads Screened In for Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Roads Screened Out from Detailed Assessment of Ecological Receptors (Natural England, 2018)
- Air Quality Management Area (AQMA)
- Site of Special Scientific Interest (SSSI)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

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Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Construction Road Vehicle Exhaust Emissions - Modelled Ecological Receptor Transects - Sheet 5 of 5

Figure: 20.5

Drawing No: PC6250-RHD-XX-ON-DR-GS-0340

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	05/02/2025	JH	DH	A3	1:6,000

Co-ordinate system: British National Grid

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Table 20-26 Designated Ecological Sites Critical Level and Load Values

Associated Road Link(s)	Designated Ecological Sites			Critical Level		Critical Load						
	Site Types	Name	Feature Name or Critical Load Class	NO_X	NH_3	Nutrient Nitrogen Deposition	Acid Deposition					
							MinCL MinN	MinCL MaxN	MinCL MaxS	MaxCL MinN	MaxCL MinN	MaxCL MaxS
				µg.m^{-3}		kgN.ha^{-1}.yr^{-1}	kgN.ha^{-1}.yr^{-1}					
24 and 80	SAC, SSSI, SPA, Ramsar[1]	Humber Estuary	Atlantic pioneer, low-mid, upper-mid salt marshes	30	1 to 3	10 to 20	NS	NS	NS	NS	NS	NS
24, 26 and 80	SAC, SSSI, SPA, Ramsar[1]	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide	30	3*	NC	NS	NS	NS	NS	NS	NS
12	Ancient Woodland	Bentley Moor Ancient Woodland	Broadleaved Deciduous woodland	30	1 to 3	10 to 15	0.142	10.993	10.851	0.142	10.993	10.851
22 and 80	LNR	Humber Bridge	-	30	3	-**	-**	-**	-**	-**	-**	-**

Note:

[1]Ramsar sites are designated wetland sites and are not included in the APIS database for being sensitive to air quality impacts. Impacts on Ramsar sites have therefore been considered under the associated SAC and SSSI designations for the same area.

** A Critical Level of 3µg.m^{-3} was advised by the ecology specialists.*

***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; NS = Not Sensitive.

178. The nearest ecological receptor for each known location of nearshore vessel movements is:

- Landfall cable installation – the nearest ecological receptor sensitive to air pollution is Hornsea Mere SSSI located 6.5km to the south of landfall.
- Vessels travelling to / from a port in Kingston upon Hull – the closest ecological receptor is Humber Estuary SAC/SPA/SSSI/Ramsar.

20.6.1.3.6 Operational NRMM and Backup Generator Emissions

179. Operational use of NRMM would be limited to routine and unplanned maintenance of onshore infrastructure. The exact location of maintenance works cannot be determined at this stage, as this will vary depending on the Project's O&M requirements, however, it will be limited to the Onshore Development Area. The nearest receptors will therefore be as described in **Section 20.6.1.3.3**.

180. With regards to backup generators located in the OCS zone, the nearest sensitive human and ecological receptors to OCS Zone 4 is Bramble Hill Farm located 120m east, and Birkhill Ancient Woodland located 775m south. The nearest human receptors to OCS Zone 8 is Bentley Hall located 240m north and the closest ecological receptor is Bentley Moor Ancient Woodland located 1km to the north-east.

20.6.1.3.7 Operational Vessel Exhaust Emissions - Ecological Receptors

181. Vessel movements associated with the Project during operation are only likely to be near to onshore sensitive ecological receptors where they are:

- Exiting or entering a port in the Humber and travelling along the Humber Estuary to deliver spare parts to support repair and replacement events for onshore infrastructure. The nearest ecological is therefore as described in **Section 20.6.1.3.5**; and
- Existing or entering an O&M base port. At this stage, no decision has been made regarding which port would be used for the Project's offshore O&M activities. A decision on the O&M base port would not be made until post DCO determination. The closest ecological receptor will therefore not be confirmed until post DCO determination.

20.6.1.4 Background Concentrations

20.6.1.4.1 Human Receptors

182. The approach to deriving appropriate background pollutant concentrations for the assessment is set out in **Section 20.5.3.3.3**. The background concentrations used in the assessment are provided in **Table 20-27**.

183. As detailed in **Table 20-22**, background pollutant concentrations are 'well below' (e.g. less than 75% of), and therefore meet, the relevant air quality objectives. Background concentrations predicted in the ERYC 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.

20.6.1.4.2 Ecological Receptors

184. Background concentrations and deposition rates of nutrient nitrogen and acid considered in the ecological assessment are provided in **Table 20-28**.

Table 20-27 Human Receptors – Background Pollutant Concentrations

Receptor ID	2023 Concentration (µg.m^{-3})			2029 Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R1	15.9	14.3	7.9	12.7	13.9	7.5
R2	15.9	14.3	7.9	12.7	13.9	7.5
R3	14.9	14.4	7.8	12.1	13.9	7.4
R4	15.9	14.3	7.9	12.7	13.9	7.5
R5	13.2	13.8	7.2	10.6	13.4	6.8
R6	15.9	14.3	7.9	12.7	13.9	7.5
R7	15.9	14.3	7.9	12.7	13.9	7.5
R8	13.2	13.8	7.2	10.6	13.4	6.8
R9	13.2	13.8	7.2	10.6	13.4	6.8
R10	13.2	13.8	7.2	10.6	13.4	6.8
R11	14.0	13.5	7.4	11.5	13.0	6.9
R12	9.4	12.3	6.4	7.2	11.8	6.0
R13	9.7	12.7	6.4	7.5	12.3	6.0
R14	8.2	15.2	6.4	6.3	14.8	6.0
R15	8.2	13.5	6.4	6.3	13.0	6.0
R16	7.3	13.7	6.2	5.8	13.3	5.8
R17	6.9	13.7	6.2	5.6	13.2	5.8
R18	7.4	12.7	6.2	6.0	12.3	5.8
R19	9.0	13.4	6.3	7.4	13.0	5.9
R20	7.0	13.6	6.0	5.4	13.1	5.6
R21	6.8	13.0	6.1	5.4	12.6	5.7
R22	6.8	13.0	6.1	5.4	12.6	5.7

Receptor ID	2023 Concentration (µg.m^{-3})			2029 Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R23	6.3	12.9	6.0	5.0	12.5	5.6
R24	5.8	12.8	5.8	4.7	12.3	5.4
R25	5.9	13.4	5.8	4.8	13.0	5.5
R26	7.3	13.5	6.2	6.0	13.1	5.8
R27	7.0	13.6	6.0	5.4	13.1	5.6
R28	6.2	13.7	6.0	4.9	13.3	5.6
R29	6.2	13.7	6.0	4.9	13.3	5.6
R30	16.9	15.4	9.3	14.2	15.0	8.9
R31	14.3	13.3	7.0	11.3	12.8	6.6
R32	14.3	13.3	7.0	11.3	12.8	6.6
R33	14.3	13.3	7.0	11.3	12.8	6.6
R34	20.9	12.6	7.0	18.3	12.2	6.6
R35	11.0	12.7	6.3	9.2	12.3	6.0
R36	14.0	13.8	8.0	11.2	13.3	7.6
R37	14.0	13.8	8.0	11.2	13.3	7.6
R38	14.5	15.0	9.7	12.1	14.5	9.2
R39	14.3	15.8	10.2	12.0	15.3	9.7
R40	14.3	15.8	10.2	12.0	15.3	9.7
R41	14.3	15.8	10.2	12.0	15.3	9.7
R42	15.8	15.3	9.7	13.8	14.8	9.2
R43	10.8	13.4	7.2	8.7	13.0	6.8
R44	10.8	13.4	7.2	8.7	13.0	6.8
R45	11.4	12.4	7.4	9.1	12.0	7.0

Receptor ID	2023 Concentration (µg.m^{-3})			2029 Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R46	11.4	12.4	7.4	9.1	12.0	7.0
R47	9.0	12.7	6.6	7.3	12.3	6.2
R48	7.3	13.5	6.2	6.0	13.1	5.8
R49	6.4	13.5	6.2	5.3	13.0	5.8
R50	5.0	11.3	5.7	4.2	10.9	5.3
R51	5.9	13.4	6.0	4.9	13.0	5.6
R52	7.6	12.0	6.5	6.2	11.5	6.1
R53	6.2	12.5	6.1	5.0	12.0	5.7
R54	6.3	12.9	6.0	5.0	12.5	5.6
R55	5.9	13.6	5.9	4.8	13.1	5.5
R56	5.5	13.7	5.7	4.5	13.4	5.4
R57	5.8	13.6	5.8	4.6	13.2	5.4
R58	5.3	12.5	5.8	4.3	12.1	5.4
R59	5.3	12.5	5.8	4.3	12.1	5.4
R60	5.6	13.3	5.8	4.6	12.9	5.5
R61	4.5	12.9	5.4	3.7	12.5	5.1
R62	4.7	12.7	5.6	3.9	12.3	5.2
R63	4.3	12.7	5.4	3.5	12.3	5.1
R64	4.5	12.8	5.4	3.7	12.4	5.1

Table 20-28 Ecological Receptors – Background Pollutant Concentrations and Deposition Rates

Link	Designated Ecological Site	1 x 1km Background Grid Square	2029 Defa Mapped Concentration (Defra 2024a)			2020-2022 Data from APIS (CEH,2024)		
	Site Type	Name	X	Y	NO_X ($\mu g.m^{-3}$)	NH_3 ($\mu g.m^{-3}$)	Nutrient Nitrogen Deposition Rate $kgN.ha^{-1}.yr^{-1}$)	Acid Deposition Rate ($keq.ha^{-1}.yr^{-1}$)
24	SAC, SSSI, SPA	Humber Estuary	505500	426500	10.1	1.8	15.8	1.1
			504500	426500	10.4			
26	SAC, SSSI, SPA	Humber Estuary	510500	428500	19.3	1.6	15.3	1.1
80	SAC, SSSI, SPA	Humber Estuary	502500	423500	7.9	2.0	16.4	1.1
			502500	425500	9.5	1.8	16.1	
12	Ancient Woodland	Bentley Moor Ancient Woodland	502500	436500	6.8	1.7	30.2	2.2
22	LNR	Humber Bridge	501500	426500	10.2	1.7	15.9	1.1
80	LNR	Humber Bridge	502500	425500	9.5	1.8	30.2	2.2

Note: Average nutrient nitrogen deposition rate ($kgN\ ha^{-1}\ yr^{-1}$) projected to decrease by 0.42$kgN\ ha^{-1}\ yr^{-1}$ from base year (2021 mid-year) to future year (2029) (i.e. 0.07 x 8 years = 0.56kgNha-1 yr-1). This results in a corresponding decrease per year in acid deposition rate of 0.0039$keq\ ha^{-1}\ yr^{-1}$.

20.6.1.4.3 Onshore Development Area

185. The background concentrations used in the construction phase NRMM emission assessment are provided in **Table 20-29**.

Table 20-29 Background Pollutant Concentrations Within the Onshore Development Area

Onshore Works (Landfall, Onshore ECC and OCS Zone) Background Concentrations 2029 (µg.m^{-3})		
NO_2	**PM_{10}**	**$PM_{2.5}$**
3.3 – 5.7	9.5 – 13.5	4.7 – 5.7

186. As detailed in **Table 20-29**, background pollutant concentrations are 'well below' (e.g. less than 75% of the air quality objectives), and therefore meet, the relevant air quality objectives across the Onshore Development Area.

20.6.1.5 Baseline Road Traffic Emissions

187. 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 2023 base year and the 2029 'without the Project' assessment. The 24-hour AADT flows, and HGV percentages used in the assessment are detailed in **Volume 2, Appendix 20.3 Construction Road Vehicle Exhaust Emissions Assessment – Traffic Data**.

188. **Table 20-30** provides the results of the baseline assessment for the base year (2023) and the future baseline year, i.e. the earliest commencement year of construction 'without the Project' (2029), which is inclusive of background concentrations as well as the traffic contribution.

Table 20-30 Baseline and Future Baseline Road Traffic Emissions Assessment Base Year (2023) and Earliest Commencement Year of Construction (2029)

Receptor ID	Base Year 2023 Concentration (µg.m^{-3})			Construction Year 2029 Concentration (µg.m^{-3})		
	NO_2	**PM_{10}**	**$PM_{2.5}$**	**NO_2**	**PM_{10}**	**$PM_{2.5}$**
Hull City Council						
R1	33.7	20.0	11.1	22.2	19.6	10.6
R2	31.8	19.0	10.5	21.1	18.6	10.0
R3	27.3	18.1	9.9	18.5	17.6	9.4
R4	28.9	18.1	9.9	19.4	17.6	9.4
R5	23.6	16.9	8.9	15.8	16.4	8.4
R6	22.0	15.8	8.7	15.7	15.4	8.3
R7	22.3	15.9	8.7	15.9	15.4	8.3
R8	16.6	14.6	7.7	12.2	14.2	7.3
R9	21.7	16.3	8.6	14.8	15.8	8.1
R10	22.6	16.5	8.7	15.3	16.0	8.3
R11	26.7	16.6	9.2	18.1	16.1	8.7
R30	27.1	18.2	10.9	19.3	17.7	10.4
R31	24.0	16.0	8.5	16.3	15.5	8.1
R32	24.6	15.7	8.3	16.6	15.2	7.9
R33	26.0	16.3	8.7	17.3	15.8	8.2
R34	29.8	15.3	8.5	22.7	14.8	8.0
R36	17.9	14.8	8.5	13.1	14.3	8.1
R37	16.7	14.5	8.4	12.5	14.0	7.9
R38	25.3	18.4	11.5	17.5	17.8	10.9
R39	21.7	17.5	11.1	15.6	17.0	10.6
R40	24.6	18.1	11.4	17.1	17.6	10.9
R41	31.3	19.8	12.3	20.7	19.2	11.7
R42	21.4	16.6	10.4	16.6	16.1	9.9
R43	17.2	14.9	8.1	11.9	14.5	7.6
R44	14.0	14.2	7.7	10.3	13.8	7.3

Receptor ID	Base Year 2023 Concentration (µg.m^{-3})			Construction Year 2029 Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R45	13.5	13.0	7.7	10.1	12.5	7.3
R46	18.1	14.2	8.3	12.5	13.7	7.9
R47	15.0	14.4	7.5	10.2	13.9	7.1
ERYC						
R12	23.5	14.4	7.8	14.6	13.9	7.2
R13	26.2	15.2	8.0	16.1	14.7	7.4
R14	17.2	16.6	7.3	10.8	16.1	6.8
R15	25.9	16.3	8.2	15.4	15.8	7.7
R16	11.3	14.5	6.6	7.7	14.0	6.2
R17	11.2	14.3	6.6	7.6	13.9	6.2
R18	13.5	13.7	6.8	9.0	13.2	6.4
R19	14.2	14.6	6.9	10.0	14.1	6.5
R20	13.2	14.5	6.6	6.4	13.5	5.8
R21	9.0	13.5	6.4	6.2	12.9	5.9
R22	12.3	14.2	6.8	9.2	14.1	6.5
R23	13.1	14.7	7.0	8.5	14.3	6.6
R24	12.5	14.6	6.8	8.1	14.1	6.4
R25	14.7	15.3	6.9	9.3	14.9	6.5
R26	10.7	14.0	6.4	7.6	13.5	6.0
R27	10.7	14.4	6.5	6.9	13.8	6.0
R28	9.5	14.5	6.5	6.5	14.1	6.1
R29	7.8	14.1	6.2	5.7	13.7	5.8

Receptor ID	Base Year 2023 Concentration (µg.m^{-3})			Construction Year 2029 Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R35	20.9	15.6	8.0	14.1	15.1	7.5
R48	12.4	14.9	6.9	8.6	14.4	6.5
R49	10.8	14.7	6.9	7.5	14.3	6.4
R50	6.6	11.7	5.8	5.0	11.2	5.4
R51	8.5	13.8	6.2	6.1	13.3	5.8
R52	10.8	12.7	6.9	7.7	12.2	6.4
R53	9.4	13.2	6.5	6.6	12.7	6.0
R54	8.4	13.3	6.2	6.1	12.9	5.8
R55	10.8	14.6	6.5	7.1	14.1	6.1
R56	8.7	14.4	6.1	6.1	14.0	5.7
R57	6.8	13.8	5.9	5.1	13.4	5.5
R58	8.1	13.3	6.2	5.7	12.9	5.8
R59	7.5	13.1	6.1	5.4	12.7	5.7
R60	6.6	13.5	6.0	5.1	13.1	5.6
R61	7.4	13.5	5.8	5.2	13.1	5.4
R62	6.3	13.2	5.8	4.7	12.7	5.4
R63	5.8	13.1	5.6	4.3	12.7	5.2
R64	5.1	12.9	5.5	4.0	12.6	5.2

189. As detailed in **Table 20-30**, annual mean concentrations of NO_2 are predicted to meet the air quality objective at all receptor locations in both the 2023 baseline and 2029 future baseline years. Annual mean PM_{10} and $PM_{2.5}$ concentrations are predicted to meet the relevant objectives at all receptors in both the 2023 baseline and 2029 future baseline years.

20.6.2 Predicted Future Baseline

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

191. The baseline review of air quality in **Section 20.6**, provides a clear indication that air quality in the Air Quality Study Area is generally good. This 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 20.2.2.1.2**. 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 detailed in **Section 20.2.2.2**.

192. Air pollution in the Air Quality 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, as shown in **Table 20-29**.

20.7 Assessment of Effects

193. The likely significant effects to air quality and dust receptors that may occur during construction, operation and decommissioning of the Project are assessed in the following sections. The assessment follows the methodology set out in **Section 20.4.5** and is based on the realistic worst-case scenarios defined in **Section 20.4.4**, with consideration of embedded mitigation measures identified in **Section 20.4.2**.

194. As noted in **Section 20.4.5,** there is potential for the assessment of likely significant effects for the OCS zone infrastructure to differ between the two development scenarios. Where the assessment outcomes are likely to differ, these have been reported separately below.

20.7.1 Potential Effects During Construction

20.7.1.1 Construction Dust and Fine Particulate Matter Emissions (AQ-C-01)

195. A qualitative assessment of construction phase dust and PM_{10} emissions has been carried out in accordance with the latest IAQM guidance (IAQM, 2024). Full details of the methodology used is provided in **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment Methodology**.

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

197. Further details are provided in **Section 20.6.1.3.1** on the focus areas for the assessment in relation to the locations of the expected worst-case construction works (i.e. landfall, the south of Beverley, the OCS zones for human receptors and the Leven Canal SSSI and Birkhill Wood Ancient Woodland for ecological receptors).

20.7.1.1.1 Step 1: Screen the Need for a Detailed Assessment

198. The IAQM guidance states that a detailed assessment is required if there are human receptors located within 250m and ecological receptors within 200m (based on advice received from Natural England) of the Onshore Development Area. Human and ecological receptors are present within 250m and 200m respectively of the Onshore Development Area, therefore a detailed assessment is required.

20.7.1.1.2 Step 2A: Define the Potential Dust Emission Magnitude

199. The IAQM guidance recommends that the potential 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 the Project, therefore demolition has not been considered in the assessment.

200. The worst-case scenarios for human and ecological receptors have been identified based on the number of receptors within 250m and 200m of the Onshore Development Area respectively. For trackout activities, receptors within 50m from the construction vehicle routes up to 250m 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 (2024) guidance.

201. The potential dust emission magnitude for the Onshore Development Area has been determined using the criteria detailed in **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment Methodology**. The dust emission magnitudes were determined from the worst-case assumptions identified in **Table 20-31**.

Table 20-31 Defined Dust Emission Magnitudes Associated for Construction Activities in the Onshore Development Area

Construction Activity	Dust Emission Magnitude	Rationale
Earthworks	Large	The proposed Onshore Development Area is anticipated to be greater than 110,000m^2 The worst-case earthworks within the Onshore Development Area will be associated with onshore export cable construction works. This will comprise removal and storage of topsoil at the side of the cable trench, followed by subsoil excavation of a trench with a target minimum depth of 1.2m. The trench would be excavated in sections along the onshore ECC.
Construction	Medium	There are not anticipated to be any buildings constructed on-site within the temporary construction compounds (e.g. offices and welfare facilities). At the OCS zone, it is assumed that most buildings will be pre-fabricated and delivered to site for assembly. However, it has been assumed that cement bound sand (CBS) would be used to line the cable trench and pack around the installed cable ducts and used as backfill for jointing bays and the TJB, which is a potentially dusty construction material.
Trackout	Large	There will be more than 50 outward daily HGV movements across the Onshore Development Area.

20.7.1.1.3 Step 2B: Define the Sensitivity of the Area

202. The sensitivity of receptors to dust soiling, impacts on human health and ecological effects has been determined using the criteria on **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment Methodology**. **Figure 20-2** details the distance bands from the Onshore Development Area used in determining the sensitivity of the area. The sensitivities of the area to dust soiling, human health and ecological effects are shown in **Table 20-32.**

20.7.1.1.3.1 Sensitivity of Receptors to Dust Soiling on People and Property

203. Overall, there are anticipated to be between one to ten existing residential properties (highly sensitive receptors) within 20m of any potential dust generation during earthworks and construction activities. The sensitivity is therefore **medium**.

204. There are more than 10 high sensitivity receptors located within 20m of road links used by construction vehicles up to 250m from site access points. The sensitivity is therefore **high**.

Table 20-32 Sensitivity of the Area for Construction Activities in the Onshore Development Area

Potential Impact	Sensitivity of the Surrounding Area		
	Earthworks	Construction	Trackout
Dust soiling	Medium	Medium	High
Human health	Low	Low	Low
Ecological	Medium	Medium	Medium

20.7.1.1.3.2 Sensitivity of Receptors to Human Health Effects of PM_{10}

205. The highest annual mean background PM_{10} concentration across the Air Quality Study Area is less than 24µg.m^{-3}. Therefore, given the number of sensitive residential receptors located within 20m of earthworks and construction activities and within 20m of potential trackout routes, the sensitivity in relation to earthworks, construction and trackout is **low**.

20.7.1.1.3.3 Sensitivity of Receptors to Ecological Effects

206. Leven Canal SSSI and Birkhill Wood Ancient Woodland are within 20m of the Onshore Development Area and potential trackout routes. The sensitivity of the area with respect to ecological impacts in relation to earthworks, construction and trackout activities is therefore considered to be **medium**.

20.7.1.1.4 Step 2C: Define the Risk of Impacts

207. The potential dust and PM_{10} emission magnitudes and sensitivity of the area(s) are combined, and the risk of impacts determined using the approach described in **Volume 2, Appendix 20.2 Construction Dust and Particulate Matter Assessment Methodology**. The risks for dust soiling, human health and ecological impacts are shown in **Table 20-33.**

Table 20-33 Risk of Dust Impacts from Construction Activities for the Onshore Development Area

Potential Impact	Dust Risk		
	Earthworks	Construction	Trackout
Dust soiling	Medium risk	Medium risk	High risk
Human health	Low risk	Low risk	Low risk
Ecological	Medium risk	Medium risk	Medium risk

20.7.1.1.5 Step 3: Determine Site-Specific Mitigation

208. Step three of the IAQM guidance (2024) identifies the appropriate good practice mitigation measures required based on the findings of Step two of the assessment methodology. Step two of the dust risk assessment determined that the greatest risk of effects is 'High risk' under the worst-case scenario, without the implementation of mitigation measures.

209. Recommended mitigation measures are listed in the IAQM guidance document (IAQM, 2024) 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.

210. A list of mitigation measures that are recommended for a high risk site, as determined by Step two of the dust assessment in the IAQM guidance (IAQM, 2024), are outlined in **Table 20-8**. These mitigation measures are included in the Outline CoCP, which will inform the AQMP developed post-consent as part of the CoCP to specify site-specific construction dust mitigation and monitoring measures (see **Table 20-7,** Commitment IDs CO39,CO55, CO69, CO76 and CO80).

20.7.1.1.6 Step 4: Determine Residual Effects

211. With the implementation of the above mitigation measures, the residual effect of construction dust and fine particulate matter emissions from the Project is considered to be **not significant** in accordance with IAQM guidance (2024).

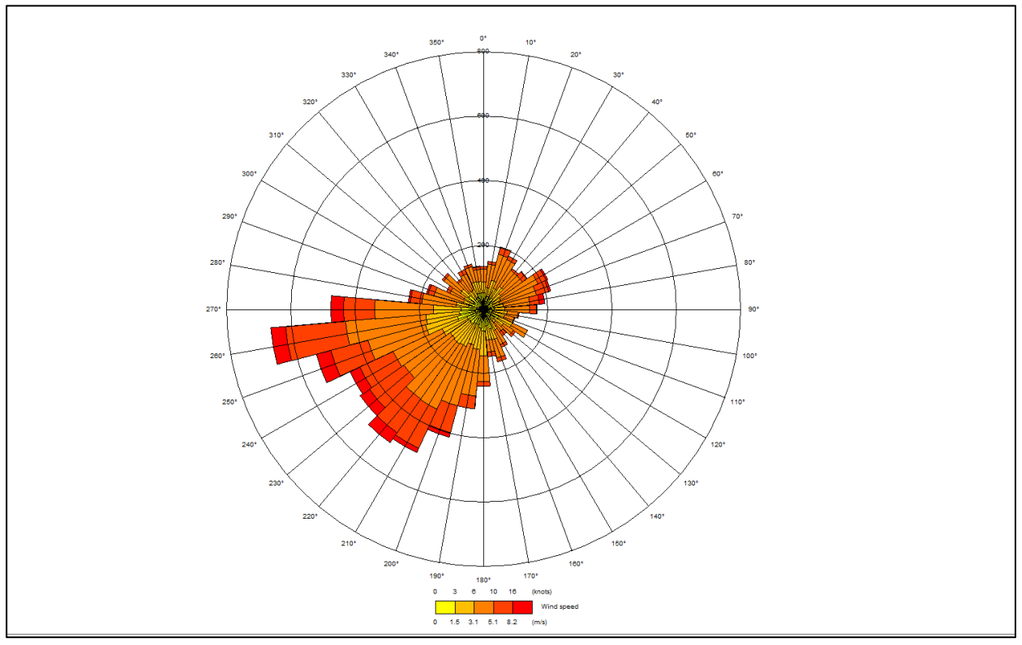
20.7.1.2 Construction NRMM Emissions (AQ-C-02)

212. Defra technical guidance (Defra, 2022b) states that emissions from NRMM used on construction sites are not likely to have a significant effect on local air quality where relevant control and management measures are employed, and that a qualitative assessment is sufficient for consideration of effects. Embedded NRMM mitigation measures (see **Table 20-8**) are included in the Outline CoCP, which will inform the AQMP developed post-consent as part of the CoCP to specify site-specific construction NRMM mitigation measures (see **Table 20-7,** Commitment IDs CO39 and CO55). The embedded mitigation measures will reduce $PM_{2.5}$ emissions are far as practicably possible in accordance with Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (HMSO, 2023) and Defra $PM_{2.5}$ Interim Planning Guidance (Defra 2024d).

213. Therefore, a qualitative assessment of project-generated NRMM emissions during onshore construction activities at the landfall, along the onshore ECC and at the OCS zones has been undertaken where effects on receptors may occur. 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 20-1**); and
- Distances from NRMM to the nearest receptors.

Plate 20-1 Leconfield Meteorological Station Wind Rose (2023)



214. The greatest anticipated number of plant working at one location at the same time is anticipated to be construction works within the OCS zone. Elsewhere within the Onshore Development Area, the construction works would be less intensive.

215. The anticipated core working hours for onshore construction of the Project is 7am-7pm Mondays to Saturdays (i.e. 72 hours per week), subject to any essential activities that are required to be undertaken outside of these times (see **Table 20-7,** Commitment ID CO69).

20.7.1.2.1 Receptor Sensitivity

216. The Onshore Development Area is largely rural in nature and, as shown in **Table 20-29**, the future 2029 background concentrations of NO_2, PM_{10} and $PM_{2.5}$ at the landfall, along the onshore ECC and at the OCS zones are anticipated to be '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. As such, the area is **not considered** to be of high sensitivity to emissions of NRMM.

217. The potential impacts associated with NRMM used at the landfall, onshore ECC and OCS zones are set out below.

20.7.1.2.2 Impact Magnitude

20.7.1.2.2.1 Landfall

218. The closest downwind human receptors are the residential properties off Hornsea Road to the west approximately 240m west of the landfall construction compound (MCC 5). Flexibility is required for the micro-siting of the trenchless installation works within the landfall construction compound, therefore the worst-case location for trenchless installation works has been assumed on a precautionary basis and assessed (i.e. located at the closest edge of the landfall construction compound area to the nearest receptor).

219. Landfall trenchless installation works may, by necessity, be required to operate 24/7 rather than only during the Project's core working hours (7am-7pm Mondays to Saturdays). The total duration of trenchless installation works at the landfall is expected to be approximately 12 months. During landfall construction, other activities including the TJB and associated link box construction and cable pulling and jointing would lag behind the trenchless installation works, and the total duration of construction at the landfall is expected to be approximately three years.

220. Given 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 embedded NRMM mitigation measures (as detailed in **Table 20-8**).

221. As detailed in **Section 20.6.1.3.2**, there are no ecological sites sensitive to air quality impacts located within 200m of the landfall construction compound.

222. NRMM emissions associated with operations at the landfall construction compound and construction of the TJB and associated link box would be more intermittent in nature and would only occur during the core working hours. Once construction of the landfall infrastructure has been completed (including demobilisation and reinstatement), no pollution sources would be present (i.e. there are no operational impacts on local air quality) at the landfall.

20.7.1.2.2.2 Onshore ECC

223. The primary activities that would occur along the onshore ECC are site preparation, construction of the temporary haul road and temporary construction compounds, open cut trenching, cable laying, trench backfilling, trenchless crossing works, construction of jointing bays and associated link boxes, cable pulling and jointing and site reinstatement.

224. As construction works along the onshore ECC would be undertaken in sections in a linear nature, NRMM plant would be operational in the vicinity of a receptor for only a relatively short duration, and not for the full duration of the onshore ECC construction programme (approximately four years).

225. As noted in **Table 20-29**, background pollutant concentrations are less than 50% of the relevant air quality objectives. Therefore, it is unlikely that NRMM along the onshore ECC would have an impact on local air quality with the implementation of embedded NRMM mitigation measures detailed in **Table 20-8**.

226. With regard to ecological receptors, the nearest sensitive receptor is Bryan Mills Field SSSI located approximately 45m from the onshore ECC at its closest point and 110m from the temporary construction compounds north of Scorborough (MCC 3 and ICC 5).

227. As shown in the wind rose in **Plate 20-1**, the prevailing winds at Leconfield are consistently from the west and south-west. Therefore, emissions from onshore export cable construction works would be dispersed away from the Bryan Mills Field SSSI, reducing the potential for impacts at the site.

20.7.1.2.3 OCS Zone

228. Both OCS zones which remain under consideration are located in arable land south and south-west of Beverley. Construction activities in the OCS zone include site preparation, enabling works, construction and assembly of buildings and outdoor structures and installation of electrical and auxiliary equipment.

229. The nearest human receptors to the OCS zones are Bramble Hill Farm located 120m east of Zone 4 and Bentley Hall located 240m north of Zone 8. The nearest ecological receptor is Birkhill Ancient Woodland, located 775m south of Zone 4 and 1,410m east for Zone 8.

230. The duration of construction works at the OCS zone during construction of the Project would occur for approximately five years. However, emissions would predominantly occur during core working hours, and plant usage would be intermittent and variable throughout the working day rather than used continuously. In addition, given that the prevailing wind direction (see **Plate 20-1**) is from the west and south-west, NRMM emissions would be dispersed away from any nearby human receptors for the majority of the time.

20.7.1.2.3.1 Effect Significance

20.7.1.2.3.1.1 Landfall

231. As there are no human or ecological receptors sensitive to air quality impacts within 200m of the landfall construction compound (MCC 5), it is likely that the effects that would occur as a result of emissions from NRMM at the landfall would be **not significant**.

20.7.1.2.3.1.2 Onshore ECC

232. Due to the low background pollutant concentrations along the onshore ECC detailed in **Table 20-29,** NRMM emissions from construction activities are likely to have a **not significant** effect at human receptors with the employment of embedded NRMM mitigation measures as detailed in **Table 20-8**.

233. The usage of plant in the onshore ECC in the vicinity of the Bryan Mills Field SSSI during construction would be intermittent and predominantly occur during the core working hours, therefore reducing the potential for significant effects at this location. It is therefore expected that with the employment of embedded NRMM mitigation measures, particularly siting plant and other emission sources as far from the Bryan Mills Field SSSI as is practicable (see **Table 20-8**), NRMM emissions from construction activities are likely to have a **not significant** effect on Bryan Mills Field SSSI.

234. Further relevant embedded mitigation measures include Commitment IDs CO39, CO55, CO69, CO76 and CO80 detailed in **Table 20-7**.

235. With the implication of the measures noted above, these effects would be **not significant**.

20.7.1.2.3.1.3 OCS Zone

236. 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 likely that the effects that occur at human receptors from NRMM at either OCS zone would be **not significant** with the employment of embedded NRMM mitigation measures (as detailed in **Table 20-8**). Further relevant embedded mitigation measures include Commitment IDs CO39, CO55, CO69, CO76 and CO80 as detailed in **Table 20-7**.

237. The nearest ecological site to both OCS zones is beyond 200m therefore, it is likely the air quality effects resulting from NRMM emissions would be **not significant**.

20.7.1.3 Construction Road Vehicle Exhaust Emissions (AQ-C-03)

238. This impact only considers impacts associated with vehicle movements for the Project's onshore construction activities. At this stage, no decision has been made regarding which port(s) would be used for the Project's offshore construction. A decision upon the offshore construction base port(s) would not be made until post DCO determination. A PAMP will be developed, if required, once the preferred offshore construction base port(s) has been confirmed and agreed with the relevant authorities prior to the commencement of construction. The PAMP (see **Table 20-7**, Commitment ID CO102) will provide an assessment of the traffic movements due to port operations associated with the Project's offshore construction activities and detail mitigation measures as required to avoid significant effects. The associated effects from construction road vehicle exhaust emissions will therefore also be covered in the PAMP.

239. A CTMP will be developed in accordance with the Outline CTMP and submitted post-consent. It will be agreed with the relevant authorities prior to the commencement of the relevant stage of construction works (see **Table 20-7**, Commitment IDs CO73 and CO75). The CTMP will detail measures to manage peak construction traffic flows to reduce vehicle emissions and set out measures to control and monitor the routeing of HDV and LDV traffic. This will limit air quality impacts on sensitive receptors located near roads used by the Project's construction traffic. Further relevant embedded mitigation measures are detailed in **Table 20-7** (Commitment IDs CO39, CO55, CO80 and CO102).

20.7.1.3.1 Human Receptors

240. The 24-hour AADT flows and HGV percentages used in the air quality assessment for the Project are detailed in **Volume 2, Appendix 20.3 Construction Road Vehicle Exhaust Emissions Assessment – Traffic Data**.

241. Predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations for the assessed construction year (2029) of the Project are detailed in Table 20-34 to

242. **Table 20-37**. All concentrations are inclusive of the background concentration at each receptor.

Table 20-34 Annual Mean NO_2 Results at Sensitive Human Receptor Locations

Receptor ID	2029 Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without Project ($\mu g.m^{-3}$)	With Project ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of the Objective	Impact Descriptor
Hull City Council					
R1	22.2	22.4	0.12	0%	Negligible
R2	21.1	21.2	0.13	0%	Negligible
R3	18.5	18.6	0.08	0%	Negligible
R4	19.4	19.5	0.10	0%	Negligible
R5	15.8	15.9	0.10	0%	Negligible
R6	15.7	15.8	0.05	0%	Negligible
R7	15.9	15.9	0.05	0%	Negligible
R8	12.2	12.3	0.03	0%	Negligible
R9	14.8	15.0	0.20	0%	Negligible
R10	15.3	15.5	0.20	0%	Negligible
R11	18.1	18.1	0.05	0%	Negligible
R30	19.3	19.4	0.10	0%	Negligible
R31	16.3	16.4	0.13	0%	Negligible
R32	16.6	16.9	0.38	1%	Negligible
R33	17.3	17.5	0.20	0%	Negligible
R34	22.7	22.8	0.10	0%	Negligible
R36	13.1	13.2	0.07	0%	Negligible
R37	12.5	12.6	0.05	0%	Negligible
R38	17.5	17.7	0.22	1%	Negligible
R39	15.6	15.8	0.20	1%	Negligible
R40	17.1	17.4	0.29	1%	Negligible
R41	20.7	21.3	0.51	1%	Negligible
R42	16.6	16.8	0.19	0%	Negligible
R43	11.9	12.1	0.23	1%	Negligible
R44	10.3	10.3	0.07	0%	Negligible
R45	10.1	10.2	0.05	0%	Negligible
R46	12.5	12.8	0.34	1%	Negligible
R47	10.2	10.4	0.20	1%	Negligible
ERYC					
R12	14.6	14.6	0.04	0%	Negligible
R13	16.1	16.1	0.04	0%	Negligible
R14	10.8	10.8	0.05	0%	Negligible
R15	15.4	15.5	0.10	0%	Negligible
R16	7.7	7.9	0.14	0%	Negligible
R17	7.6	7.8	0.12	0%	Negligible
R18	9.0	9.2	0.17	0%	Negligible
R19	10.0	10.1	0.13	0%	Negligible
R20	6.4	6.5	0.06	0%	Negligible
R21	6.2	6.2	0.06	0%	Negligible
R22	8.9	9.2	0.32	1%	Negligible
R23	8.5	8.7	0.25	1%	Negligible
R24	8.1	8.3	0.25	1%	Negligible

Receptor ID	2029 Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$) Objective = $40\mu g.m^{-3}$				
	Without Project ($\mu g.m^{-3}$)	With Project ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of the Objective	Impact Descriptor
R25	9.3	9.6	0.28	1%	Negligible
R26	7.6	7.7	0.07	0%	Negligible
R27	6.9	7.1	0.11	0%	Negligible
R28	6.5	6.7	0.12	0%	Negligible
R29	5.7	5.8	0.06	0%	Negligible
R35	14.1	14.2	0.10	0%	Negligible
R48	8.6	8.7	0.15	0%	Negligible
R49	7.5	7.7	0.20	1%	Negligible
R50	5.0	5.1	0.12	0%	Negligible
R51	6.1	6.2	0.07	0%	Negligible
R52	7.7	7.9	0.18	0%	Negligible
R53	6.6	6.7	0.12	0%	Negligible
R54	6.1	6.1	0.08	0%	Negligible
R55	7.1	7.4	0.24	1%	Negligible
R56	6.1	6.2	0.17	0%	Negligible
R57	5.1	5.2	0.05	0%	Negligible
R58	5.7	5.8	0.08	0%	Negligible
R59	5.4	5.5	0.06	0%	Negligible
R60	5.1	5.3	0.16	0%	Negligible
R61	5.2	5.3	0.17	0%	Negligible
R62	4.7	4.8	0.12	0%	Negligible
R63	4.3	4.5	0.14	0%	Negligible
R64	4.0	4.2	0.21	1%	Negligible

Table 20-35 Annual Mean PM_{10} Results at Sensitive Human Receptor Locations

Receptor ID	2029 Annual Mean PM_{10} Concentrations ($\mu g.m^{-3}$) Objective = $40\mu g.m^{-3}$				
	Without Project ($\mu g.m^{-3}$)	With Project ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of the Objective	Impact Descriptor
Hull City Council					
R1	19.6	19.7	0.11	0%	Negligible
R2	18.6	18.7	0.09	0%	Negligible
R3	17.6	17.7	0.07	0%	Negligible
R4	17.6	17.7	0.06	0%	Negligible
R5	16.4	16.5	0.06	0%	Negligible
R6	15.4	15.4	0.03	0%	Negligible
R7	15.4	15.4	0.03	0%	Negligible
R8	14.2	14.2	0.02	0%	Negligible
R9	15.8	15.9	0.11	0%	Negligible
R10	16.0	16.2	0.12	0%	Negligible
R11	16.1	16.1	0.05	0%	Negligible
R30	17.7	17.8	0.05	0%	Negligible
R31	15.5	15.6	0.08	0%	Negligible
R32	15.2	15.4	0.12	0%	Negligible
R33	15.8	15.9	0.10	0%	Negligible

Receptor ID	2029 Annual Mean PM_{10} Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without Project ($\mu g.m^{-3}$)	With Project ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of the Objective	Impact Descriptor
R34	14.8	14.9	0.08	0%	Negligible
R36	14.3	14.3	0.05	0%	Negligible
R37	14.0	14.0	0.03	0%	Negligible
R38	17.8	17.9	0.15	0%	Negligible
R39	17.0	17.1	0.08	0%	Negligible
R40	17.6	17.7	0.10	0%	Negligible
R41	19.2	19.3	0.17	0%	Negligible
R42	16.1	16.1	0.07	0%	Negligible
R43	14.5	14.6	0.09	0%	Negligible
R44	13.8	13.8	0.05	0%	Negligible
R45	12.5	12.6	0.03	0%	Negligible
R46	13.7	13.8	0.13	0%	Negligible
R47	13.9	14.1	0.12	0%	Negligible
ERYC					
R12	13.9	13.9	0.03	0%	Negligible
R13	14.7	14.8	0.04	0%	Negligible
R14	16.1	16.2	0.03	0%	Negligible
R15	15.8	15.9	0.07	0%	Negligible
R16	14.0	14.1	0.05	0%	Negligible
R17	13.9	13.9	0.06	0%	Negligible
R18	13.2	13.3	0.09	0%	Negligible

Receptor ID	2029 Annual Mean PM_{10} Concentrations ($\mu g.m^{-3}$) Objective = 40$\mu g.m^{-3}$				
	Without Project ($\mu g.m^{-3}$)	With Project ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of the Objective	Impact Descriptor
R19	14.1	14.2	0.07	0%	Negligible
R20	13.5	13.5	0.03	0%	Negligible
R21	12.9	12.9	0.02	0%	12.9
R22	14.1	14.2	0.12	0%	14.1
R23	14.3	14.4	0.17	0%	Negligible
R24	14.1	14.3	0.16	0%	Negligible
R25	14.9	15.1	0.18	0%	Negligible
R26	13.5	13.6	0.03	0%	Negligible
R27	13.8	13.9	0.07	0%	Negligible
R28	14.1	14.1	0.08	0%	Negligible
R29	13.7	13.7	0.04	0%	Negligible
R35	15.1	15.2	0.09	0%	Negligible
R48	14.4	14.5	0.10	0%	Negligible
R49	14.3	14.4	0.15	0%	Negligible
R50	11.2	11.3	0.05	0%	Negligible
R51	13.3	13.4	0.05	0%	Negligible
R52	12.2	12.3	0.07	0%	Negligible
R53	12.7	12.8	0.07	0%	Negligible
R54	12.9	12.9	0.05	0%	Negligible
R55	14.1	14.2	0.11	0%	Negligible
R56	14.0	14.1	0.09	0%	Negligible

Receptor ID	2029 Annual Mean PM_{10} Concentrations (µg.m^{-3}) Objective = 40µg.m^{-3}				
	Without Project (µg.m^{-3})	With Project (µg.m^{-3})	Change (µg.m^{-3})	Change as % of the Objective	Impact Descriptor
R57	13.4	13.4	0.02	0%	Negligible
R58	12.9	12.9	0.05	0%	Negligible
R59	12.7	12.7	0.04	0%	Negligible
R60	13.1	13.2	0.10	0%	Negligible
R61	13.1	13.2	0.11	0%	Negligible
R62	12.7	12.8	0.09	0%	Negligible
R63	12.7	12.8	0.12	0%	Negligible
R64	12.6	12.7	0.16	0%	Negligible

Table 20-36 Short Term PM_{10} Results at Sensitive Human Receptor Locations

Receptor ID	2029 Number of Days PM_{10} >50µg.m^{-3} (Objective being less than 35 exceedances per year)		
	Without Project	With Project	Change in Number of Days >50 µg.m^{-3}
Hull City Council			
R1	0	0	0
R2	0	0	0
R3	0	0	0
R4	0	0	0
R5	0	0	0
R6	0	0	0
R7	0	0	0
R8	0	0	0
R9	0	0	0
R10	0	0	0
R11	0	0	0
R30	0	0	0
R31	0	0	0
R32	0	0	0
R33	0	0	0
R34	0	0	0
R36	0	0	0
R37	0	0	0
R38	0	0	0
R39	0	0	0
R40	0	0	0
R41	0	0	0
R42	0	0	0
R43	0	0	0
R44	0	0	0
R45	0	0	0
R46	0	0	0
R47	0	0	0
ERYC			
R12	0	0	0

Receptor ID	2029 Number of Days PM_{10} >50µg.m^{-3} (Objective being less than 35 exceedances per year)		
	Without Project	With Project	Change in Number of Days >50 µg.m^{-3}
R13	0	0	0
R14	0	0	0
R15	0	0	0
R16	0	0	0
R17	1	1	0
R18	0	0	0
R19	0	0	0
R20	0	0	0
R21	0	0	0
R22	0	0	0
R23	0	0	0
R24	0	0	0
R25	1	1	0
R26	1	1	0
R27	1	1	0
R28	2	3	0
R29	0	0	0
R35	0	0	0
R48	0	0	0
R49	0	0	0
R50	0	0	0
R51	0	0	0

Receptor ID	2029 Number of Days PM_{10} >50µg.m^{-3} (Objective being less than 35 exceedances per year)		
	Without Project	With Project	Change in Number of Days >50 µg.m^{-3}
R52	0	0	0
R53	0	0	0
R54	0	0	0
R55	0	0	0
R56	0	0	0
R57	0	0	0
R58	0	0	0
R59	0	0	0
R60	0	0	0
R61	0	0	0
R62	0	0	0
R63	0	0	0
R64	0	0	0

Note: Values have been rounded to the nearest whole number therefore the change observed between without and with the Project does not always equate to an overall change of the same magnitude.

Table 20-37 Annual Mean $PM_{2.5}$ Results at Sensitive Human Receptor Locations

Receptor ID	2029 Annual Mean $PM_{2.5}$ Concentrations (µg.m^{-3}) Objective = 20µg.m^{-3}				
	Without Project (µg.m^{-3})	With Project (µg.m^{-3})	Change (µg.m^{-3})	Change as % of the Objective	Impact Descriptor
Hull City Council					
R1	10.6	10.6	0.06	0%	Negligible
R2	10.0	10.0	0.05	0%	Negligible

Receptor ID	2029 Annual Mean $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) Objective = 20$\mu g.m^{-3}$				
	Without Project ($\mu g.m^{-3}$)	With Project ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of the Objective	Impact Descriptor
R3	9.4	9.4	0.04	0%	Negligible
R4	9.4	9.5	0.03	0%	Negligible
R5	8.4	8.5	0.03	0%	Negligible
R6	8.3	8.3	0.02	0%	Negligible
R7	8.3	8.3	0.02	0%	Negligible
R8	7.3	7.3	0.01	0%	Negligible
R9	8.1	8.2	0.06	0%	Negligible
R10	8.3	8.3	0.06	0%	Negligible
R11	8.7	8.7	0.03	0%	Negligible
R30	10.4	10.4	0.03	0%	Negligible
R31	8.1	8.1	0.04	0%	Negligible
R32	7.9	8.0	0.07	0%	Negligible
R33	8.2	8.3	0.05	0%	Negligible
R34	8.0	8.0	0.04	0%	Negligible
R36	8.1	8.1	0.03	0%	Negligible
R37	7.9	7.9	0.02	0%	Negligible
R38	10.9	11.0	0.08	0%	Negligible
R39	10.6	10.6	0.04	0%	Negligible
R40	10.9	11.0	0.06	0%	Negligible
R41	11.7	11.8	0.09	0%	Negligible
R42	9.9	9.9	0.04	0%	Negligible
R43	7.6	7.7	0.05	0%	Negligible

Receptor ID	2029 Annual Mean $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) Objective = 20$\mu g.m^{-3}$				
	Without Project ($\mu g.m^{-3}$)	With Project ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of the Objective	Impact Descriptor
R44	7.3	7.3	0.03	0%	Negligible
R45	7.3	7.3	0.02	0%	Negligible
R46	7.9	7.9	0.07	0%	Negligible
R47	7.1	7.2	0.07	0%	Negligible
ERYC					
R12	7.2	7.3	0.02	0%	Negligible
R13	7.4	7.5	0.02	0%	Negligible
R14	6.8	6.8	0.02	0%	Negligible
R15	7.7	7.7	0.04	0%	Negligible
R16	6.2	6.3	0.03	0%	Negligible
R17	6.2	6.2	0.03	0%	Negligible
R18	6.4	6.4	0.05	0%	Negligible
R19	6.5	6.5	0.04	0%	Negligible
R20	5.8	5.8	0.02	0%	Negligible
R21	5.9	5.9	0.01	0%	Negligible
R22	6.5	6.6	0.06	0%	Negligible
R23	6.6	6.7	0.09	0%	Negligible
R24	6.4	6.5	0.09	0%	Negligible
R25	6.5	6.6	0.10	0%	Negligible
R26	6.0	6.1	0.02	0%	Negligible
R27	6.0	6.1	0.04	0%	Negligible
R28	6.1	6.1	0.04	0%	Negligible

Receptor ID	2029 Annual Mean $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) Objective = 20$\mu g.m^{-3}$				
	Without Project ($\mu g.m^{-3}$)	With Project ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of the Objective	Impact Descriptor
R29	5.8	5.9	0.02	0%	Negligible
R35	7.5	7.6	0.05	0%	Negligible
R48	6.5	6.6	0.05	0%	Negligible
R49	6.4	6.5	0.08	0%	Negligible
R50	5.4	5.5	0.03	0%	Negligible
R51	5.8	5.8	0.03	0%	Negligible
R52	6.4	6.5	0.04	0%	Negligible
R53	6.0	6.1	0.04	0%	Negligible
R54	5.8	5.9	0.03	0%	Negligible
R55	6.1	6.1	0.06	0%	Negligible
R56	5.7	5.8	0.05	0%	Negligible
R57	5.5	5.5	0.01	0%	Negligible
R58	5.8	5.8	0.03	0%	Negligible
R59	5.7	5.7	0.02	0%	Negligible
R60	5.6	5.6	0.06	0%	Negligible
R61	5.4	5.5	0.06	0%	Negligible
R62	5.4	5.5	0.05	0%	Negligible
R63	5.2	5.3	0.07	0%	Negligible
R64	5.2	5.3	0.09	0%	Negligible

243. The results of the construction road vehicle exhaust emissions assessment show that annual mean concentrations of NO_2 (see **Table 20-34**), PM_{10} (see **Table 20-35**) and $PM_{2.5}$ (see **Table 20-37**) are predicted to be well below (i.e. less than 75% of), and therefore meet, the respective air quality objectives in the peak construction year (2029) at all receptors, both 'with' and 'without' the Project in place.

245. The changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations are 1% or less at all receptors. This corresponded to a '**negligible**' impact, in accordance with IAQM and EPUK guidance (IAQM & EPUK, 2017) detailed in **Table 20-20**.

246. All predicted NO_2 concentrations are well below 60$\mu g.m^{-3}$ and therefore, in accordance with Defra guidance (Defra, 2021a), the 1-hour mean objective is not likely to be exceeded (see **Table 20-34**). Based on the calculation provided by Defra, as detailed in **Section 20.5.3.3.5.3**, the short term PM_{10} Objective was predicted to be met at all modelled locations (the objective being less than 35 exceedances of 50 $\mu g.m^{-3}$ as a 24-hour mean). As shown in **Table 20-36**, there was no change in the number of days exceeding the 24-hour mean objective between the 'without' and 'with' the Project assessments, using the Defra (2022) calculation.

247. The assessment therefore concludes that overall effect significance generated by the Project's construction-generated road traffic upon local air quality in relation to human health receptors is **not significant**.

20.7.1.3.2 Ecological Receptors

20.7.1.3.2.1 Critical Levels

248. **Table 20-38** to **Table 20-39** present the potential contribution of the Project (i.e. Project's construction) and the in-combination contribution (i.e. Project's traffic and 2023 to 2029 traffic growth), respectively, on the sensitive ecological receptors within the Air Quality Study Area in relation to NO_X and NH_3. Values that exceed 1% of the Critical Level, i.e. those which cannot be considered to be insignificant, are shown in bold text. For habitats with multiple receptor transects modelled, the two transects with the highest predicted pollutant concentrations are reported.

249. Predicted total pollutant concentrations (including the relevant background pollutant concentrations) at the ecological receptor locations alone and in-combination are detailed in **Table 20-38** to **Table 20-39**. Values that exceed 100% of the Critical Level are shown in bold text. Full results for each ecological receptor transect are detailed in **Volume 2, Appendix 20.5 Construction Road Vehicle Exhaust Emissions Assessment – Ecological Transect Results**.

Table 20-38 Maximum Contribution of Project-Generated NO_x Critical Level Results

Designated Ecological Sites	Feature Name	Road Link (Road Name)	Transect ID and Starting Distance from Road Link	Maximum NO_x Contribution				Total NO_x Concentration including Background	
				Change in NO_x Concentration ($\mu g.m^{-3}$)		Change as % of Critical Level		With Project In-Combination* ($\mu g.m^{-3}$)	% of Critical Level
				Contribution from Project Alone	Contribution from Project In-combination*	Project Alone Contribution	Project In-Combination*		
Humber Estuary SAC, SSSI, SPA, Ramsar	*Atlantic pioneer, low-mid, upper-mid salt marshes*	*24 (A63 Clive Sullivan Way)*	HE_SM3_10m	0.1	2.0	0.46%	**6.50%**	12.0	40.06%
			HE_SM4_8m	0.1	1.9	0.45%	**6.28%**	12.0	39.83%
	Mudflats and sandflats not covered by seawater at low tide		HE_MU1_10m	0.1	1.8	0.42%	**5.97%**	11.9	39.52%
			HE_MU2_5m	0.2	2.9	0.68%	**9.75%**	13.0	43.30%
	Atlantic pioneer, low-mid, upper-mid salt marshes	80 (A15 Humber Bridge)	HE_SM8_0m	0.02	0.07	0.05%	0.22%	8.0	26.57%
	Mudflats and sandflats not covered by seawater at low tide		HE_MU9_0m	0.03	0.2	0.08%	0.74%	9.7	32.47%
	Mudflats and sandflats not covered by seawater at low tide	26 (A63 Castle Street)	HE_MU11_77m	0.1	0.4	0.25%	**1.20%**	19.6	65.40%
Bentley Moor Ancient Woodland	Broadleaved Deciduous woodland	12 (A1079 Beverly Bypass)	AW_01_165m	0.1	0.1	0.22%	0.35%	6.9	23.13%
Humber Bridge LNR	-	22 (A15 Lowthorpe Way)	HB_LNR_02_150m	0.1	0.4	0.38%	**1.24%**	10.5	35.15%
	-	80 (A15 Humber Bridge)	HB_LNR_01_35m	0.1	1.1	0.29%	**3.58%**	10.6	35.31%

Note: AADT change shown are inclusive of the project-generated traffic, in-combination traffic growth (from 2023 to 2029). Any relevant cumulative project traffic will be included at ES stage.

Table 20-39 Maximum Contribution of Project-Generated NH_3 Critical Level Results

Designated Ecological Sites	Feature Name	Road Link (Road Name)	Transect ID and Starting Distance from Road Link	Maximum NH_3 Contribution						Total NH_3 Concentration including Background		
				Change in NH_3 Concentration ($\mu g.m^{-3}$)		Project Alone Change as % of Critical Level		Project In-Combination Change as % of Critical Level*		With Project In-Combination* ($\mu g.m^{-3}$)	as % of Lower Critical Level	as % of Upper Critical Level
				Contribution from Project Alone	Contribution from Project In-combination*	Lower Critical Level	Upper Critical Level	Lower Critical Level	Upper Critical Level			
Humber Estuary SAC, SSSI, SPA	Atlantic pioneer, low-mid, upper-mid salt marshes	24 (A63 Clive Sullivan Way)	HE_SM3_10m	0.039	0.209	**3.86%**	**1.29%**	**20.91%**	**6.97%**	2.05	**204.91%**	68.30%
			HE_SM4_8m	0.037	0.202	**3.73%**	**1.24%**	**20.20%**	**6.73%**	2.04	**204.20%**	68.07%
	Mudflats and sandflats not covered by seawater at low tide		HE_MU1_10m	0.035	0.192	-	**1.18%**	-	**6.40%**	2.03	-	67.73%
			HE_MU2_5m	0.058	0.313	-	**1.92%**	-	**10.45%**	2.15	-	71.78%
	Atlantic pioneer, low-mid, upper-mid salt marshes	80 (A15 Humber Bridge)	HE_SM8_0m**	0.002	0.008	0.20%	0.07%	0.80%	0.27%	1.99	**198.80%**	66.27%
	Mudflats and sandflats not covered by seawater at low tide		HE_MU9_0m**	0.005	0.024	-	0.17%	-	0.80%	1.82	-	60.80%
	Mudflats and sandflats not covered by seawater at low tide	26 (A63 Castle Street)	HE_MU11_77m	0.010	0.042	-	0.34%	-	**1.39%**	1.65	-	55.05%
Bentley Moor Ancient Woodland	Broadleaved Deciduous woodland	12 (A1079 Beverly Bypass)	AW_01_165m	0.010	0.015	**1.03%**	0.34%	**1.45%**	0.48%	1.75	**175.45%**	58.48%

Designated Ecological Sites	Feature Name	Road Link (Road Name)	Transect ID and Starting Distance from Road Link	Maximum NH_3 Contribution						Total NH_3 Concentration including Background		
				Change in NH_3 Concentration ($\mu g.m^{-3}$)		Project Alone Change as % of Critical Level		Project In-Combination Change as % of Critical Level*		With Project In-Combination* ($\mu g.m^{-3}$)	as % of Lower Critical Level	as % of Upper Critical Level
				Contribution from Project Alone	Contribution from Project In-combination*	Lower Critical Level	Upper Critical Level	Lower Critical Level	Upper Critical Level			
Humber Bridge LNR	-	22 (A15 Lowthorpe Way)	HB_LNR_02_150m	0.014	0.038	-	0.45%	-	**1.26%**	1.78	-	59.26%
	-	80 (A15 Humber Bridge)	HB_LNR_01_35m	0.022	0.115	-	0.73%	-	**3.84%**	1.92	-	63.84%

Note:

**AADT change shown are inclusive of the project-generated traffic, in-combination traffic growth (from 2023 to 2029). Any relevant cumulative project traffic will be included at ES stage.*

***The Humber Bridge is modelled 30m above the Humber Estuary however the distance from road is measured from a birds eye view.*

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250. As shown in **Table 20-38**, the NO_x contribution of the Project was below 1% at all locations at all designated sites. Therefore, the overall significance of the effect of impacts of the Project alone in relation to NO_X concentrations at designated ecological sites is considered to be **not significant**.

251. In-combination contributions of NO_x were above 1% of the Critical Level at the Humber Bridge LNR near links 22 (A15 Lowthorpe Way) and 80 (A15 Humber Bridge). With regards to the Humber Estuary SAC, SPA, SSSI and Ramsar, the in-combination contribution also exceeded 1% of the Critical Level for saltmarsh and mudflats habitat near links 24 (A63 Clive Sullivan Way) and 26 (A63 Castle Street), but it was not exceeded near to link 80. Total in-combination NO_x concentrations were well below (<75% of) the Critical Level at all modelled receptors; therefore, the overall effect significance of impacts of NO_X concentrations at designated ecological sites is considered to be not significant.

252. As shown in **Table 20-39** and in **Volume 2, Appendix 20.5 Construction Road Vehicle Exhaust Emissions Assessment – Ecological Transect Results**, concentrations of NH_3 generated from Project traffic alone along road link 24 (A63 Clive Sullivan Way) were at or above 1% of the Critical Level at all modelled transects along the Humber Estuary SAC, SPA, SSSI and Ramsar for both habitats present (salt marshes and mud flats). Whereas, only the in-combination impact exceeded 1% of the Critical Level near to link 26 (A63 Castle Street), and neither the Project alone nor in-combination contribution exceeded 1% of the Critical Level near to link 80 (A15 Humber Bridge).

253. At the Humber Bridge LNR near link 22 (A15 Lowthorpe way) and link 80 (A15 Humber Bridge), the in-combination contribution exceeded 1% of the NH_3 Critical Level near to both road links. Both the Project alone and in-combination exceeded 1% of the lower Critical Level at Bentley Moor Ancient Woodland near link 12 (A1709 Beverley Bypass). However, neither contribution exceeded the upper Critical Level.

254. Total in-combination NH_3 concentrations were above the lower Critical Level for saltmarsh at the Humber Estuary SAC, SPA, SSSI and Ramsar but did not exceed the upper Critical Level. It also exceeded the upper Critical Level at the Humber Bridge LNR and Bentley Moor Ancient Woodland due to elevated background NH_3 concentrations.

255. It should be noted that NH_3 concentrations fluctuate greatly due to meteorological factors. NH_3 data from the UK Eutrophying & Acidifying Network (UKEAP) national NH_3 monitoring network shows high spatial variability of the annual average concentration across a range of sites. The normal variation in NH_3 concentrations throughout a year can be more than 1µg.m^{-3} (100% of the lower Critical Level) throughout the year (UKEAP 2023). Therefore, limited interpretation can be made because NH_3 concentrations can fluctuate by more than the lower Critical Level throughout the course of a year.

256. The resulting effect significance of construction road vehicle exhaust NH_3 emissions on ecological receptors must be evaluated by an ecologist to determine whether there would be any significant adverse effect on the features for which the sites are designated. As such, the significance of effects is discussed in **Chapter 23 Onshore Ecology and Ornithology**.

20.7.1.3.2.2 Critical Loads

257. **Table 20-40** to **Table 20-41** present the potential contribution of the Project (i.e. Project's construction) and the in-combination contribution (i.e. Project's traffic, 2023 to 2029 traffic growth), respectively, on the sensitive ecological receptors within the Air Quality Study Area in relation to nutrient nitrogen deposition and acid deposition. Values that exceed 1% of the Critical Load, i.e. those which cannot be considered to be insignificant, are shown in bold text. For habitats with multiple receptor transects modelled, the two transects with the highest predicted deposition rates are reported.

258. Predicted total deposition rates (including the relevant background deposition rates) at the ecological receptor locations for the Project alone and in-combination are detailed in **Table 20-40** to **Table 20-41**. Values that exceed 100% of the Critical Load are shown in in bold text. Full results for each ecological receptor transect are detailed in **Volume 2, Appendix 20.5 Construction Road Vehicle Exhaust Emissions Assessment – Ecological Transect Results**.

Table 20-40 Maximum Contribution of Project-Generated Nutrient Nitrogen Deposition Critical Load Results

Designated Ecological Sites	Feature Name	Road Link (Road Name)	Transect ID and Starting Distance from Road Link	Maximum Nutrient Nitrogen Contribution						Total Nutrient Nitrogen Deposition including Background		
				Change in Nutrient Nitrogen Deposition (kgN.ha.yr^{-1})		Change in Nutrient Nitrogen Deposition from Project Alone as % Critical Load		Change in Nutrient Nitrogen Deposition from Project In-Combination as % of Critical Load		With Project In-Combination* (kgN.ha.yr^{-1})	% of Lower Critical Load	% of Upper Critical Load
				Contribution from Project Alone	Contribution from Project In-combination*	Lower Critical Load	Upper Critical Load	Lower Critical Load	Upper Critical Load			
Humber Estuary SAC, SSSI, SPA, Ramsar	Atlantic pioneer, low-mid, upper-mid salt marshes	24 (A63 Clive Sullivan Way)	HE_SM3_10m	0.21	1.21	**2.10%**	0.21%	**12.05%**	**1.21%**	16.96	**169.55%**	84.78%
			HE_SM4_8m	0.20	1.17	**2.03%**	0.20%	**11.65%**	**1.17%**	16.92	**169.15%**	84.58%
	Atlantic pioneer, low-mid, upper-mid salt marshes	80 (A15)	HE_SM8_0m	0.01	0.05*	0.12%	0.01%	0.47%	0.05%	16.48	**164.77%**	82.38%
Bentley Moor Ancient Woodland	Broadleaved Deciduous woodland	12 (A1079 Beverly Bypass)	AW_01_165m	0.09	0.13	**1.84%**	0.61%	**2.61%**	0.87%	30.30	**606.01%**	**202.00%**

Note: AADT change shown are inclusive of the project-generated traffic, in-combination traffic growth (from 2023 to 2029). Any relevant cumulative project traffic will be included at ES stage.

Table 20-41 Maximum Contribution of Project-Generated Acid Deposition Critical Load Results

Designated Ecological Sites	Feature Name	Road Link (Road Name)	Transect ID and Starting Distance from Road Link	Maximum Acid Deposition Contribution				Total Nutrient Acid Deposition including Background	
				Change in Acid Deposition (keq.ha.yr^{-1})		Change in Acid Deposition as % of Critical Load		Total Acid Deposition In-Combination* (keq.ha.yr^{-1})	% of Critical Load
				Contribution from Project Alone	Contribution from Project In-combination*	Contribution from Project	Contribution from Project In-combination*		
Bentley Moor Ancient Woodland	Broadleaved Deciduous woodland	12 (A1079 Beverly Bypass)	AW_01_165m	0.007	0.009	0.06%	0.08%	2.17	19.74%

Note: AADT change shown are inclusive of the project-generated traffic, in-combination traffic growth (from 2023 to 2029). Any relevant cumulative project traffic will be included at ES stage.

259. As shown in **Table 20-40**, the Project alone and in-combination are predicted to result in nutrient nitrogen impacts above 1% of the lower Critical Load at the closest locations to the road edge along the transect at the Humber Estuary SAC, SPA, SSSI and Ramsar (south-east of the link 24, A63)). Project alone and in-combination nutrient nitrogen deposition at transects modelled 30m below link 80 Humber Bridge were below the critical level for both habitats present.

260. It should be noted that the worst-case predicted impacts are presented in **Table 20-40**, at the closest boundary of ecological sites to affected road links.

261. As shown in **Plate 20-2**, road traffic nutrient nitrogen deposition rates decrease with distance from the road edge. The Humber Estuary SAC, SPA, SSSI and Ramsar transect HE_SM_3 was selected as its closest receptor point has the highest predicted nutrient nitrogen deposition therefore demonstrates the worst-case decrease in nutrient nitrogen deposition with distance. For the Humber Estuary SAC, SPA, SSSI and Ramsar transect HE_SM3, project alone impacts were below 1% of the lower Critical Load at 40m from the road edge. Similarly, for the Humber Estuary SAC, SPA, SSSI and Ramsar transect HE_SM4 at 38m from the road edge, the contribution of the Project alone dropped below 1% of the Critical Load.

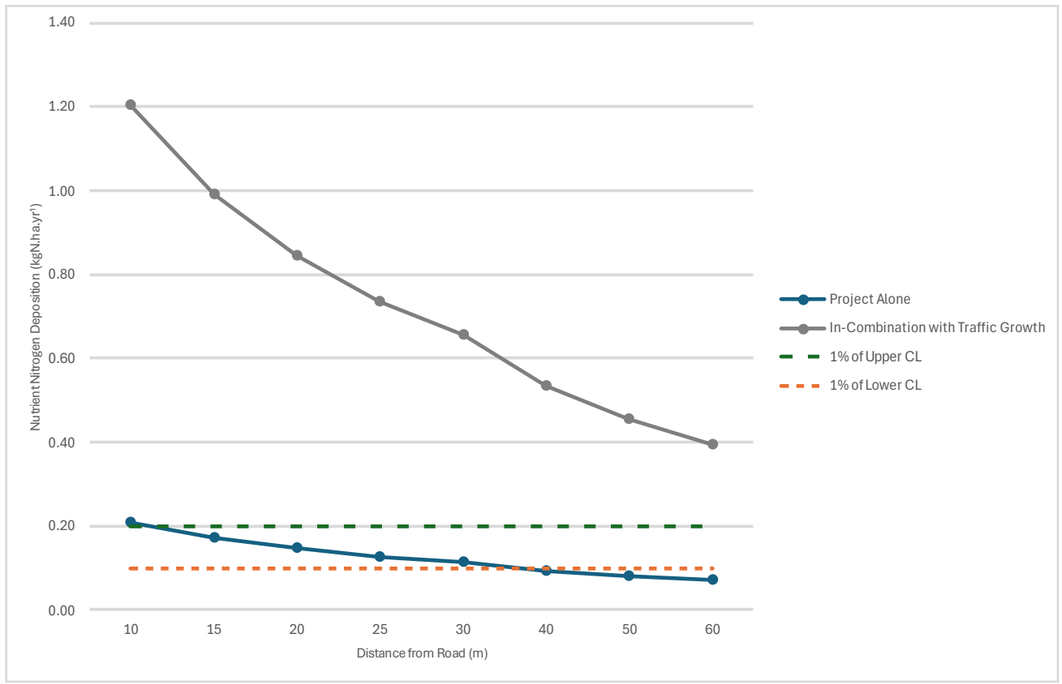

Plate 20-2 Nutrient Nitrogen Deposition for Project Alone and In-Combination at HE_SM_3 Transect

262. Full results for each ecological receptor transect are detailed in **Volume 2, Appendix 20.5 Construction Road Vehicle Exhaust Emissions Assessment – Ecological Transect Results**.

263. Project alone and in-combination nutrient nitrogen deposition, including contributions from background traffic growth, was predicted to exceed 1% of the relevant lowest Critical Load at and the Bentley Moor Ancient Woodland (south-west of link 12, A1709 Beverly Bypass).

264. It should be noted that background nutrient nitrogen deposition exceeds the lower Critical Loads at all sites both without and with the Project or in-combination contributions. Ecological interpretation of these impacts is therefore required.

265. An absence of likely significant cannot be concluded for all sites where the nutrient nitrogen deposition was predicted to exceed 1% of the relevant Critical Load, as there is potential for significant effects. As such, the effect significance of nutrient nitrogen deposition impacts is discussed in **Chapter 23 Onshore Ecology and Ornithology**.

266. **Table 20-41** shows that acid deposition as a result of traffic associated with either the Project alone or in-combination does not exceed 1% of the relevant Critical Loads. Therefore, the effect significance of acid deposition impacts on the Bentley Moor Ancient Woodland is considered to be **not significant**.

267. Natural England guidance (Natural England, 2018) states that it is appropriate to apply a pragmatic approach to identify which plans or projects to include in an in-combination (i.e. cumulative) assessment. It may be reasonable to consider those *"of most direct relevance"* to the Project. The guidance goes on to say that the plans or projects to consider *"may be those which are simply the closest to the site or within a certain distance from it, or the most influential in nature."* At this stage, the assessment includes consideration of all additional future sources of traffic growth which could impact upon designated sites. However, to provide a more proportionate assessment at the ES stage, an assessment of plans and projects which are of most direct relevance to the Project will be undertaken as part of the assessment of committed development.

268. Should it be the case that the effect of a committed development can be considered significant in its own right, and that the effect of the Project alone is not significant, then that committed development will not be considered further in the assessment of the Project. It is expected that the committed development in question will have its own HRA, produced by those responsible for the assessment of that committed development. As per Natural England guidance (Natural England, 2018*), "it is only the appreciable effects of those other plans and projects that are not themselves significant alone which are added into an in-combination assessment with the subject proposal (i.e. 'don't combine individual biscuits (=insignificant) with full packs (=significant)')."* This was not undertaken for the PEIR because, as discussed in **Section 20.8.1**, only a preliminary assessment of cumulative traffic and transport effects has been undertaken at this stage. However, this will be considered further at ES once the necessary data is available.

20.7.1.4 Construction Vessel Emissions (AQ-C-04)

269. Vessel emissions within the North Sea are regulated by the designated Emissions Control Area under the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI, which applies strict pollutant emission limits. Vessel emission restrictions are expected to tighten in future years, following the availability and introduction of cleaner technologies and fuels, alongside policy such as the Maritime 2050 and Clean Maritime Plan. These policies provide a strategy for the transition to zero emission shipping within the UK. Therefore, future air pollutant emissions from vessels are expected to reduce. For project vessels, compliance with existing and emerging vessel fuel standard regulations will be implemented through the PEMP (see **Table 20-7**, Commitment ID CO25).

270. Vessel movements associated with the Project would represent a small proportion of overall vessel traffic in the North Sea (particularly smaller vessels) and would therefore account for a small proportion of total North Sea emissions.

271. The maximum number of landfall installation vessels is anticipated to be eight. The closest ecological receptor sensitive to air quality impacts is Hornsea Mere SSSI located 6.5km to the south of landfall at Skipsea. Given the low number of vessels and the distance to the nearest ecological receptor, the effect of landfall installation vessels is considered **not significant**.

272. Vessels may travel along the Humber Estuary SAC / SSSI / SPA / Ramsar and berth at a port in the Humber to deliver construction materials to support onshore construction activities. However, these vessel movements are unlikely to be new trips generated by the Project alone but rather part of the existing baseline of shipping traffic into the Humber along established cargo shipping routes.

273. With respect to vessel movements associated with offshore construction activities, no decision has been made at this stage regarding the location(s) of the offshore construction base port(s). Therefore, it is not possible to identify onshore ecological receptors that may be sensitive to air quality impacts arising from these vessel movements.

274. In addition, the above port facilities would operate under existing port(s) planning consents, and where any new consents are required to accommodate the Project's construction activities, this would be subject to new planning applications.

275. As such, it is considered that evidence of an absence of likely significant effect has been presented and therefore impacts of construction vessel emissions on onshore sensitive receptors have not been assessed further.

20.7.2 Potential Effects during Operation

20.7.2.1 Operational NRMM and Backup Generator Emissions (AQ-O-02)

20.7.2.1.1 NRMM Emissions

276. Operational use of NRMM would be limited to routine and unplanned maintenance of onshore infrastructure. Therefore, the use of plant and machinery would be localised and only occur intermittently and infrequently. The impact would be much lower than compared to the assessed construction activities detailed in **Section 20.7.1.2**, which were not considered to give rise to significant effects.

277. Further details on the O&M activities associated with the Project's onshore infrastructure are described in **Chapter 4 Project Description**.

278. Evidence of an absence of likely significant effect has been presented and therefore impacts of operational NRMM emissions on onshore sensitive receptors have not been assessed further.

20.7.2.1.2 Backup Generator Emissions

279. A detailed assessment of emergency backup generators has not been undertaken at this stage of design because details on the number, size and proximate location within the OCS zone are not confirmed. Preliminary assumptions are based upon indicative information provided by the Applicant and will be refined further at ES stage if available.

280. The Air Quality Consultant's Technical Note on the Air Quality Impacts from Testing Individual Emergency Diesel Generators (Air Quality Consultants, 2025) was published to provide an evidential basis for screening out the need for detailed assessments of generator emissions.

281. The technical note recommends that the impacts of emissions from the testing of generators on the one hour mean NO_2 air quality objective can be screened out of an air quality assessment without the need for detailed modelling if:

- *'there is a single generator being tested for no more than 18 hours per year; and*
- *the receptor is predominantly upwind of, or below, the generator; or*
- *the receptor is predominantly downwind of the generator and there is no other primary source of NO_2 close by that could feasibly lead to an exceedance of the one hour mean standard at that location.'*

282. It is currently assumed that at least one 965 kW diesel-powered emergency backup generator will be required within the OCS zone. The emergency backup generator(s) would be in operation for a maximum of one hour per month for testing and up to 72 hours continuously under emergency usage. The specific number and location of the emergency backup generator(s) within the OCS zone will be confirmed at detailed design stage. It is expected the emergency backup generator(s) would be located as far as practicable from receptors and other nearby emission sources and using best practicable technology.

283. As detailed in **Section 20.6.1.3.6**, the nearest residential and ecological receptors are over 120m and 775m respectively upwind from OCS Zones 4 and 8. Given the limited operational requirements, the use of best practicable technology to minimise the release of air pollutants, and the distance to the nearest receptors, it is considered using the criteria of the Air Quality Consultants technical note that evidence of an absence of likely significant effect has been presented.

284. Generators which have a thermal input rating greater than 1MWth will require an operational Environmental Permit under the Medium Combustion Plant Directive. Emergency backup generators which are tested <50 hours / year are exempt from the 'Specified Generator' requirements, but they are still classed as 'Medium Combustion Plant'. The new unit 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 required. The Applicant would apply for and have in place the requisite permit(s) for its emergency backup power provision at the appropriate time, likely in the post-consent stages of the Project. The permit requirements would ensure significant effects are not experienced.

20.7.2.2 Operational Road Vehicle Exhaust Emissions (AQ-O-03)

285. The OCS and ESBI will be unmanned with no permanent on-site personnel presence. Hence, operational traffic associated with the Project would be limited to routine and unplanned maintenance. Inspection and maintenance works would typically involve a very small number of vehicles, typically LDV (e.g. vans). Infrequently, equipment may be required to be replaced, therefore the use of an occasional HGV may be required, depending on the nature of the replacement. Further details on the O&M activities associated with the Project's onshore infrastructure are described in **Chapter 4 Project Description**. **Chapter 26 Traffic and Transport** identities the likely number of vehicle movements required during the O&M phase and concludes that there is no potential for significant effects with respect to traffic impacts.

286. At this stage, no decision has been made regarding which port would be used for the Project's offshore O&M activities. A decision on the O&M base port would not be made until post DCO determination. A PAMP will be developed, if required, once the preferred O&M base port has been confirmed and agreed with the relevant authorities prior to the commencement of operation. The PAMP (see **Table 20-7**, Commitment ID CO102) will provide an assessment of the traffic movements due to port operations associated with the Project's offshore O&M activities and detail mitigation measures as required to avoid significant effects. The associated road vehicle exhaust emission effects will therefore also be covered in the PAMP.

287. As such, operational road traffic movements are expected to be below the EPUK & IAQM criteria and the National Highways criteria outlined in **Table 20-11**. Therefore, it is considered that evidence of an absence of likely significant effect has been presented, and impacts of operational road vehicle exhaust emissions on human and ecological receptors have not been assessed further.

20.7.2.3 Operational Vessel Emissions (AQ-O-04)

288. As described in **Chapter 4 Project Description**, O&M activities at the landfall will primarily involve routine non-intrusive inspection works at the TJB installed onshore, and maintenance of landfall infrastructure is expected to be minimal.

289. Vessel movements along the Humber Estuary SAC / SPA / SSSI / Ramsar and berthing at a port in the Humber may be required during the O&M phase to deliver spare parts to support repair and replacement events for onshore infrastructure. Due to the non-routine nature, project-generated vessel movements to a port in the Humber during the O&M phase are likely to be negligible and form part of the existing vessel traffic in the Humber along established cargo shipping routes.

290. With respect to vessel movements associated with offshore O&M activities, no decision has been made at this regarding the location(s) of the O&M base port. Therefore, it is not possible to identify onshore ecological receptors that may be sensitive to air quality impacts arising from these vessel movements.

291. In addition, the above port facilities would operate under existing port(s) planning consents, and where any new consents are required to accommodate the Project's O&M activities, this would be subject to new planning applications.

292. As such, and further to the rationale provided in **Section 20.7.1.4**, it is considered that evidence of an absence of likely significant effect has been presented and therefore impacts of operational vessel emissions on onshore sensitive receptors have not been assessed further.

20.7.3 Potential Effects during Decommissioning

20.7.3.1 Decommissioning Dust and Fine Particulate Matter, NRMM and Road Vehicle Exhaust Emissions (AQ-D-01, AQ-D-02 and AQ-D-03)

293. No decision has been made regarding the final decommissioning strategy for the onshore infrastructure, as it is recognised that regulatory requirements and industry best practice change over time.

294. Commitment ID CO56 (see **Table 20-7**) requires an Onshore Decommissioning Plan to be prepared and agreed with the relevant authorities prior to the commencement of onshore decommissioning works. This will ensure that decommissioning air quality and dust impacts will be assessed in accordance with the applicable regulations and guidance at that time of decommissioning where relevant, with appropriate mitigation implemented as necessary to avoid significant effects.

295. The detailed activities and methodology for decommissioning will be determined later within the Project's lifetime, but would be expected to include:

- Deinstallation and removal of electrical equipment, buildings and other infrastructure for the OCS and ESBI;
- Removal of above-ground link boxes along the onshore ECC;
- Inspection of underground infrastructure to be left in-situ along the onshore ECC and at the landfall (i.e. TJB, jointing bays, underground link boxes, onshore export cables and ducting) to ensure they are safe to remain in place. If considered unsuitable to be left in-situ at the time of decommissioning, these components will be removed; and
- Site reinstatement and landscaping.

296. Whilst a detailed assessment of decommissioning impacts cannot be undertaken at this stage, for this assessment, it is assumed that decommissioning is likely to operate within the parameters identified for construction (i.e. any activities are likely to occur within the temporary construction working areas and require no greater amount or duration of activity than assessed for construction). The decommissioning sequence will generally be the reverse of the construction sequence. It is therefore assumed that decommissioning impacts would likely be of similar nature to, and no worse than, those identified during the construction phase.

20.7.4 Additional Mitigation Measures

297. No additional mitigation measures have been proposed for air quality and dust.

20.8 Cumulative Effects

298. Cumulative effects are the result of the impacts of the Project acting in combination with the impacts of other proposed and reasonably foreseeable developments on receptors. This includes plans and projects that are not inherently considered as part of the current baseline.

299. The overarching framework used to identify and assess cumulative effects is set out in **Chapter 6 Environmental Impact Assessment Methodology**. The four-stage approach is based upon the Planning Inspectorate Advice Note Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment (Planning Inspectorate, 2024). The fourth stage of the process is the assessment stage, which is detailed within the sections below for potential cumulative effects on air quality and dust receptors.

20.8.1 Screening for Potential Cumulative Effects

300. The first step of the CEA identifies which impacts associated with the Project alone, as assessed under **Section 20.7**, have the potential to interact with other plans and projects to give rise to cumulative effects. All potential cumulative effects to be taken forward in the CEA are detailed in **Table 20-42** with a rationale for screening in or out. Only impacts determined to have a residual effect of negligible or greater are included in the CEA. Where an assessment of effects has been scoped out, these impacts are excluded, as there is no potential for them to contribute to a cumulative effect.

Table 20-42 Air Quality and Dust – Potential Cumulative Effects

Impact ID	Impact and Project Activity	Potential for Cumulative Effects	Rationale
Construction			
AQ-C-01	Construction dust and fine particulate matter emissions – construction activities such as earthworks and trackout	Yes	There is potential for cumulative construction dust effects where projects occur within 500m of each other, as dust impacts are considered within a 250m buffer from each project, as detailed in **Section 20.5.3.1**. Therefore, two projects would need to be within 500m of each other for cumulative dust effects to occur.
AQ-C-02	Construction NRMM emissions – exhaust emissions from plant and equipment usage during construction activities	Yes	There is potential for cumulative NRMM emission effects where projects overlap.
AQ-C-03	Construction road vehicle exhaust emissions – exhaust emissions from road vehicle movements associated with construction activities	Yes	Where the construction phase of the Project overlaps with other projects, there is the potential for cumulative effects associated with related road traffic emissions on the local road network.
AQ-C-04	Construction vessel emissions – exhaust emissions from nearshore vessel movements associated with construction activities	No	Evidence of an absence of a likely significant effect has been presented, and construction vessel exhaust emissions impacts are not assessed further. Therefore, there is no potential for significant cumulative effects.
Operation and Maintenance			
AQ-O-02	Operational NRMM and backup generator emissions - exhaust emissions from routine and unplanned maintenance activities and backup generators during operation	No	Evidence of an absence of a likely significant effect has been presented, and operational air quality impacts are not assessed further. Therefore, there is no potential for significant cumulative effects.
AQ-O-03	Operational road vehicle exhaust emissions - exhaust emissions from road vehicle movements during operation	No	
AQ-O-04	Operational vessel emissions - exhaust emissions from nearshore vessel movements during operation.	No	
Decommissioning			
There is insufficient information available on other plans and projects which could have a spatial and temporal overlap with the Project's onshore decommissioning works. The details and scope of onshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Onshore Decommissioning Plan (see **Table 20-7**, Commitment ID CO56). This will include a detailed assessment of decommissioning impacts and appropriate mitigation measures to avoid significant effects, including cumulative effects. For this assessment, it is assumed that cumulative decommissioning effects would be of similar nature to, and no worse than, those identified during the construction phase.			

301. As discussed in **Chapter 26 Traffic and Transport**, only a preliminary assessment of cumulative traffic and transport effects has been undertaken for the PEIR, and a full CEA will be undertaken at the ES stage. The CEA section of **Chapter 26 Traffic and Transport** is limited to identifying other plans and projects which will be included in the CEA to be presented in the ES. The traffic data for these cumulative plans and projects, which is required to undertake assessments of cumulative traffic air quality effects, will therefore not be available until the ES. Hence, the cumulative traffic air quality effects will be assessed in the ES.

302. As discussed in **Section 20.7.1.4**, construction vessel exhaust emissions impacts are not considered to have the potential to cause likely significant effects. Similarly, **Section 20.7.2.1**, **Section 20.7.2.2** and **Section 20.7.2.3** explain that operational NRMM, emergency backup generators, road vehicle exhaust and vessel exhaust emission impacts do not have the potential to cause likely significant effects. Hence, these impacts are excluded from the scope of the CEA.

20.8.2 Screening for Other Plans / Projects

303. The second step of the CEA identifies a short-list of other plans and projects that have the potential to interact with the Project to give rise to significant cumulative effects during the construction and O&M phases. The short-list provided in **Table 20-43** has been produced specifically to assess cumulative effects on air quality and dust receptors. The exhaustive list of all onshore plans and projects considered in the development of the Project's CEA framework is provided in **Volume 2, Appendix 6.5 Cumulative Effects Screening Report - Onshore**.

304. Developments that were fully operational during baseline characterisation, including at the time of site-specific surveys, are considered as part of baseline conditions for the surrounding environment. It is assumed that any residual effects associated with these developments are captured within the baseline information. As such, these developments are not subject to further assessment within the CEA and excluded from the screening exercise presented in **Table 20-43**.

305. For developments that were not fully operational, including those in planning / pre-construction stages or under construction, during baseline characterisation and operational developments with potential for ongoing impacts, these are included in the screening exercise presented in **Table 20-43**.

306. The screening exercise has been undertaken based on available information on each plan or project up to and including 31st December 2024. Information has been obtained from the Planning Inspectorate's NSIP portal, ERYC and Hull City Council planning portals. It is noted that further information regarding the identified plans and projects may become available between PEIR publication and DCO application submission or may not be available in detail prior to construction. The assessment presented here is therefore considered to be conservative at the time of PEIR publication. The list of plans and projects will be updated at ES stage to incorporate more recent information at the time of writing.

307. Plans and projects identified in **Table 20-43** have been assigned a tier based on their development status, the level of information available to inform the CEA and the degree of confidence. A three tier system based on the Planning Inspectorate Advice Note Seventeen has been adopted (Planning Inspectorate, 2024).

308. The zone of influence (ZoI) used to identify relevant plans and projects for the air quality CEA depends on the element of the Project with the potential to cause cumulative effects. Construction dust emissions from the Onshore Development Area only has the potential to cause cumulative effects at receptors up to 250m from the Onshore Development Area, with the receptors also experiencing cumulative construction impacts from another project 250m away from it. Hence, the ZoI used in the air quality CEA is 500m, with the exception of road vehicle exhaust emissions impacts.

309. Road vehicle exhaust emission have the potential to cause effects at receptors up to 200m from affected road links. Where there is spatial and temporal overlap of activities on the affected road network with other projects, the receptors may experience cumulative road vehicle exhaust emission impacts.

310. Each plan or project in **Table 20-43** has been considered on a case-by-case basis. Only plans and projects with potential for significant cumulative effects with the Project are taken forward to a detailed assessment, which are screened based on the following criteria:

- There is potential that a pathway exists whereby an impact could have a cumulative effect on a receptor;
- The impact on a receptor from the Project and the plan or project in consideration has a spatial overlap (i.e. occurring over the same area);
- The impact on a receptor from the Project and the plan or project in consideration has a temporal overlap (e.g. occurring at the same time);
- There is sufficient information available on the plan or project in consideration and moderate to high data confidence to undertake a meaningful assessment; and
- There is some likelihood that the residual effect (i.e. after accounting for mitigation measures) of the Project could result in significant cumulative effects with the plan or project in consideration.

311. The CEA for air quality and dust has identified a total of four projects where significant cumulative construction effects could arise in combination with the Project. A detailed assessment of cumulative effects is provided in the section below.

Table 20-43 Short List of Plans / Projects for the Air Quality and Dust Cumulative Effects Assessment

Project / Plan	Development Type	Status	Tier	Construction / Operation Period	Closest Distance to Onshore ECC (km)	Closest Distance to OCS Zone 4 (km)	Closest Distance to OCS Zone 8 (km)	Potential for Significant Cumulative Effects	Rationale
A164 And Jock's Lodge Junction Improvement Scheme Adjacent to and South of Beverley Road (20/01073/STPLF)	Road Improvement Scheme	Approved	1	Construction: 2024 to 2026 Operation: 2027+	0.77	0.40	1.94	No	This road improvements project will be constructed prior to the commencement of the Project's onshore construction. Therefore, this project is not taken forward into the air quality CEA.
Creyke Beck Solar Farm (21/02335/STPLF)	Solar Farm	Approved	1	Construction: Unknown Operation: Unknown	0.33	1.05	1.56	Yes	There is potential for a temporal overlap of construction activities with the Project, which could result in cumulative effects within the Air Quality Study Area. This project is therefore considered in the air quality CEA.
Dogger Bank A Offshore Wind Farm (EN010021)	Offshore Wind Farm	Operational	1	Operation: 2025+	0	0.50	2.66	No	These wind farm projects will be operational prior to the commencement of the Project's onshore construction. Therefore, these projects are not taken forward into the air quality CEA.
Dogger Bank B Offshore Wind Farm (EN010021)	Offshore Wind Farm	Operational	1	Construction: 2020 to 2025 Operation: 2026+	0	0.50	2.66	No	
Dogger Bank South Offshore Wind Farms (EN010125)	Offshore Wind Farm	Examination	1	Construction: 2026 to 2033 Operation: 2034+	0	0.10	0.30	Yes	There is potential for a temporal overlap of construction activities which could cause cumulative effects within the Air Quality Study Area. This project is therefore considered in the air quality CEA.
Hornsea Project Four Offshore Wind Farm (EN010098)	Offshore Wind Farm	Under Construction	1	Construction: 2024 to 2028 Operation: 2029+	0	0.11	0.01	No	This wind farm project will be operational prior to the commencement of the Project's onshore construction. Therefore, this project is not taken forward into the air quality CEA.
Peartree Hill Solar Farm (EN010157)	Solar Farm	Planning	2	Construction: 2026 to 2027 Operation: 2028+	0.42	1.05	2.66	No	This solar farm project will be operational prior to the commencement of the Project's onshore construction. Therefore, this project is not taken forward into the air quality CEA.

Project / Plan	Development Type	Status	Tier	Construction / Operation Period	Closest Distance to Onshore ECC (km)	Closest Distance to OCS Zone 4 (km)	Closest Distance to OCS Zone 8 (km)	Potential for Significant Cumulative Effects	Rationale
Birkhill Wood National Grid Substation	Electricity Transmission Infrastructure	Planning	3	Construction: 2026 to 2030 Operation: 2031+	0	1.11	2.31	Yes	There is potential temporal overlap with construction of the Project which could result in cumulative effects within the Air Quality Study Area. However, no planning applications for this electricity infrastructure project has been submitted at the time of writing, and there is limited information available on the project to inform the assessment of cumulative air quality impacts. As such, a meaningful assessment of potential cumulative effects will be undertaken at ES based on publicly available information at the time.
North Humber to High Marnham Grid Upgrade (EN020034)	Electricity Transmission Infrastructure	Planning	3	Construction: 2028 to 2030 Operation: 2031+	0	0.89	0.41	Yes	There is potential temporal overlap with construction of the Project which could result in cumulative effects within the Air Quality Study Area. However, no planning applications for this electricity infrastructure project has been submitted at the time of writing, and there is limited information available on the project to inform the assessment of cumulative air quality impacts. As such, a meaningful assessment of potential cumulative effects will be undertaken at ES based on publicly available information at the time.

20.8.3 Assessment of Cumulative Effects

312. As described in **Table 20-43**, there is the potential for cumulative construction air quality effects as a result of the following projects and the Project:

- Dogger Bank South Offshore Wind Farms;
- North Humber to High Marnham Grid Upgrade;
- Birkhill Wood National Grid Substation; and
- Creyke Beck Solar Farm.

313. Similar to the approach noted in **Section 20.4.5**, the CEA for the OCS zone infrastructure would remain the same for both development scenarios. Only one OCS zone option will be taken forward to development. Therefore, there is no cumulative development scenario in which both OCS zones would be developed to be considered in the CEA.

314. At the time of writing, there is insufficient information on North Humber to High Marnham Grid Upgrade and Birkhill Wood National Grid Substation to undertake a meaningful assessment of potential cumulative effects at this stage. Therefore, the CEA with respect to these projects will be re-examined at ES stage based on publicly available information at the time.

20.8.3.1 Construction Dust and Particulate Matter (AQ-C-01)

20.8.3.1.1 Cumulative Effect Significance

315. A construction dust assessment was undertaken as part of the air quality assessment to accompany the Dogger Bank South Offshore Wind Farms project. The assessments were undertaken in accordance with IAQM guidance on the assessment of dust from demolition and construction (IAQM, 2024).

316. The construction dust assessment for the project conclude that the construction effects would be temporary and effects in relation to dust are predicted to be not significant. The assessment includes reference to specific mitigation measures to be implemented in line with IAQM guidance (IAQM, 2024), stating that, with the implementation of the recommended mitigation measures, effects would be **not significant**.

317. An Outline Construction Environmental Management Plan was submitted to accompany the Creyke Beck Solar Farm planning application. The plan outlines measures in order to control, prevent and minimise dirt on the access route and emissions of dust and other airborne contaminants during the solar farm project's construction works. It is therefore anticipated that the cumulative effects from construction phase dust emissions effects would be **not significant**.

318. For the cumulative projects that currently have insufficient information available (North Humber to High Marnham Grid Upgrade and Birkhill Wood National Grid Substation), it is anticipated that a construction dust assessment would be undertaken and best practice mitigation methods will be recommended. As it is anticipated that these cumulative projects will also implement recommended mitigation measures (likely in accordance with the guidance provided by the IAQM (2024)), it is anticipated that the residual effects from construction phase dust emissions, when combined with those of the Project, would be **not significant**. This will be re-examined in the CEA prepared at ES stage based on publicly available information at the time.

319. It is therefore anticipated that cumulative effect associated with construction phase dust emissions from these projects combined with the Project would be **not significant**.

20.8.3.2 Construction NRMM Emissions (AQ-C-02)

20.8.3.2.1 Cumulative Effect Significance

320. Due to the potential for overlapping construction programmes and the proximity of the same projects listed in **Section 20.8.3.1** to the Project, there is the potential (albeit unlikely) for NRMM associated with the Project's construction to be operating at the same time and in the same area as NRMM associated with the identified cumulative projects.

321. During the preparation of the ES, the potential for cumulative effects within the Air Quality Study Area with respect to construction NRMM emissions will be reviewed, and an assessment will be carried out if required. However, pollutant concentrations at all receptors considered in this assessment were well below, and therefore expected to meet, the relevant air quality objectives. Furthermore, it is anticipated that each project will employ mitigation measures to control and manage NRMM emissions as standard best practice. Therefore, it is likely that the cumulative effect associated with construction NRMM emissions would be **not significant**.

20.8.3.3 Construction Road Vehicle Exhaust Emission (AQ-C-03)

322. As discussed in **Section 20.8.1**, the traffic data for cumulative schemes, which is required to undertake assessments of cumulative road vehicle exhaust emissions effects, will not be available until the ES. Traffic associated with future developments in the Air Quality Study Area will be included in the predicted future traffic growth incorporated into the future baseline traffic flows used in the air quality assessment. A cumulative assessment will therefore be carried out at ES stage.

20.9 Inter-Relationships and Effects Interactions

20.9.1 Inter-Relationships

323. Inter-relationships are defined as effects arising from residual effects associated with different environmental topics acting together upon a single receptor or receptor group. Potential inter-relationships between air quality and dust and other environmental topics have been considered, where relevant, within the PEIR. **Table 20-44** provides a summary of key inter-relationships and signposts to where they have been addressed in the relevant chapters.

Table 20-44 Air Quality and Dust – Inter-Relationships with Other Topics

Impact ID	Impact and Project Activity	Related EIA Topic	Where Assessed in the PEIR Chapter	Rationale
Construction				
AQ-C-01 AQ-C-02 AQ-C-03	Construction dust and fine particulate matter emissions – construction activities such as earthworks and trackout Construction NRMM emissions – exhaust emissions from plant and equipment usage during construction activities Construction road vehicle exhaust emissions – exhaust emissions from road vehicle movements associated with construction activities	**Chapter 23 Onshore Ecology and Ornithology**	**Section 20.7.1.1, Section 20.7.1.2 and Section**	Construction air quality emissions have the potential to affect onshore ecological receptors.
		Chapter 29 Human Health		Construction air quality emissions have the potential to affect population and human health.
Operation and Maintenance				
No inter-relationships identified for the O&M phase, as evidence has been provided to demonstrate the absence of likely significant effect associated with operational air quality impacts.				
Decommissioning				
The details and scope of onshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Onshore Decommissioning Plan (see **Table 20-7**, Commitment ID CO56). For this assessment, it is assumed that inter-relationships during the decommissioning phase would be of similar nature to those identified during the construction phase.				

20.9.2 Interactions

324. The impacts identified and assessed in this chapter have the potential to interact with each other. Potential interactions between impacts are identified in **Table 20-45**. Where there is potential for interaction between impacts, these are assessed in **Table 20-46** for each receptor or receptor group.

325. Interactions are assessed by development phase ("phase assessment") to see if multiple impacts could increase the overall effect significance experienced by a single receptor or receptor group during each phase. Following from this, a lifetime assessment is undertaken which considers the potential for multiple impacts to accumulate across the construction, O&M and decommissioning phases and result in a greater effect on a single receptor or receptor group. When considering synergistic effects from interactions, it is assumed that the receptor sensitivity remains consistent, while the magnitude of different impacts is additive.

Table 20-45 Air Quality and Dust – Potential Interactions between Impacts throughout the Project's Lifetime

Construction, Operation and Maintenance

	AQ-C-01	AQ-C-02	AQ-C-03	AQ-C-04	AQ-O-02	AQ-O-03	AQ-O-04
Construction dust and fine particulate matter emissions (AQ-C-01)		Yes	Yes	No	No	No	No
Construction NRMM emissions (AQ-C-02)	Yes		Yes	No	No	No	No
Construction road vehicle exhaust emissions (AQ-C-03)	Yes	Yes		No	No	No	No
Construction vessel emissions (AQ-C-04)	No	No	No		No	No	No
Operational NRMM and backup generator emissions (AQ-O-02)	No	No	No	No		No	No
Operational road vehicle exhaust emissions (AQ-O-03)	No	No	No	No	No		No
Operational vessel emissions (AQ-O-04)	No	No	No	No	No	No	

Decommissioning

The details and scope of onshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Onshore Decommissioning Plan (see **Table 20-7**, Commitment ID CO56).

For this assessment, it is assumed that interactions during the decommissioning phase would be of similar nature to, and no worse than, those identified during the construction phase.

Table 20-46 Interaction Assessment – Phase and Lifetime Effects

Receptor	Impact ID	Highest Significance Level			Phase Assessment	Lifetime Assessment
		Construction	Operation and Maintenance	Decommissioning		
Human receptors	AQ-C-01 AQ-C-02 AQ-C-03	Not significant with the implementation of mitigation measures detailed in **Section 20.7.1.1**, **Section 20.7.1.2** and **Section 20.7.1.3**.	N/A	TBC – Assumed no greater than construction	**Construction**: No greater than individually assessed impact. The proposed mitigation will minimise the potential for significant effects on human receptors in relation to construction dust particulate matter and NRMM emissions within the Air Quality Study Area, and no significant effects are predicted for construction road vehicle exhaust emissions during the construction phase of the Project. Very few human receptors have the potential to be affected by all three construction impacts. Furthermore, background pollutant concentrations in the Air Quality Study Area are low (see **Table 20-27**) and therefore it is not likely that the air quality objectives would be exceeded even in the unlikely event of the impacts interacting. It is therefore considered that interactions would not exacerbate the potential impacts associated with these activities during construction. **Operation and Maintenance:** N/A **Decommissioning:** No greater than individually assessed impact. For assessment purposes, it is assumed that decommissioning impacts will be of similar nature to and no worse than construction impacts.	N/A
Ecological receptors	AQ-C-01 AQ-C-02 AQ-C-03	See **Chapter 23 Onshore Ecology and Ornithology** for effect significance of construction air quality emissions on ecological receptors.	N/A	TBC – Assumed no greater than construction	**Construction**: No greater than individually assessed impact. The proposed mitigation will minimise the potential for significant effects on ecological receptors in relation to construction dust particulate matter and NRMM emissions within the Air Quality Study Area during the construction phase. Effect significance is determined in **Chapter 23 Onshore Ecology and Ornithology** however, no ecological receptors have the potential to be affected by all three impacts. It is therefore considered that interactions would not exacerbate the potential impacts associated with these activities during construction. **Operation and Maintenance:** N/A **Decommissioning:** No greater than individually assessed impact. For assessment purposes, it is assumed that decommissioning impacts will be of similar nature to and no worse than construction impacts.	N/A

20.10 Monitoring Measures

326. The Outline CoCP includes a commitment that the site-specific AQMP developed post-consent by the Principal Contractor(s) as part of the CoCP (see **Table 20-7**, Commitment ID CO55) include site-specific monitoring measures for dust and other air emissions during construction works to be undertaken. No additional monitoring measures are therefore proposed.

20.11 Summary

327. This chapter has provided a characterisation of the existing air quality baseline conditions and an assessment of effect with respect to onshore air quality and dust impacts during the construction, O&M and decommissioning phases of the Project. Offshore air quality impacts have been scoped out, but impacts of nearshore vessel emissions on onshore sensitive ecological receptors have been considered.

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

329. The effect of construction dust and fine particulate matter from the Project on human and ecological receptors would be not significant with the implementation of site-specific mitigation measures.

330. The effect of construction NRMM exhaust emissions on human and ecological receptors would be not significant with the implementation of relevant embedded mitigation measures.

331. The effect of project-generated construction road vehicle exhaust emissions on existing human receptors was predicted to be not significant.

332. The effect of project-generated construction road vehicle exhaust emissions on designated ecological sites 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 effect significance (which will be addressed in and **Chapter 23 Onshore Ecology and Ornithology**).

333. The impacts of construction and operational vessel exhaust emissions, operational road vehicle exhaust emissions, and operational NRMM and emergency backup generator emissions were not assessed in detail. However, evidence was provided demonstrating the absence of likely significant effect.

334. **Table 20-47** presents a summary of the preliminary results of the assessment of likely significant effects on air quality and dust during the construction, operation and decommissioning of the Project.

20.12 Next Steps

335. At ES stage, the Air Quality and Dust chapter will incorporate any additional data which becomes available following the submission of the PEIR and consider relevant stakeholders' comments received as part of the statutory consultation. The air quality and dust assessment will also be updated based on any refinements made to the Project Design Envelope. Assessment of air quality impacts to LWS would be considered at ES stage, as required.

336. The assessment of cumulative effects (see **Section 20.8**) associated with road vehicle exhaust emissions will also be undertaken in the ES once traffic data for the relevant cumulative plans and projects becomes available.

Table 20-47 Summary of Potential Effects Assessed for Air Quality and Dust

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Receptor Sensitivity	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
Construction									
AQ-C-01	Construction dust and fine particulate matter emissions – construction activities such as earthworks and trackout	CO39 CO55 CO69 CO76 CO80	Human receptors within 250m of the Onshore Development Area.	Dust Soiling: Medium to high.	Medium to high risk	**Not Significant** IAQM guidance (2024) states that construction dust and fine particulate matter emissions are likely to be not significant with the implementation of appropriate mitigation measures.	N/A	**Not Significant**	Construction dust and air quality emissions monitoring procedures to be identified in AQMP (CO55)
				Human Health: Low	Low risk				
			Designated ecological sites within 200m of the Onshore Development Area.	Ecological: Medium	Medium risk				
AQ-C-02	Construction NRMM emissions – exhaust emissions from plant and equipment usage during construction activities	CO39 CO55 CO69 CO76 CO80	Human and ecological receptor in close proximity to where NRMM works would occur.	High	N/A	**Not Significant** Defra technical guidance (Defra, 2018) states that emissions from NRMM used on construction sites are not likely to have a significant effect on local air quality where relevant control and management measures are employed.	N/A	**Not Significant**	
AQ-C-03	Construction road vehicle exhaust emissions – exhaust emissions from road vehicle movements associated with construction activities	CO39 CO55 CO73 CO75 CO80 CO102	Residential properties, schools, hospitals and care homes within 200m of affected roads.	High	Negligible impact at all receptors.	**Not Significant**	N/A	**Not Significant**	N/A
			Designated ecological sites within 200m of affected roads.	High			See **Chapter 23 Onshore Ecology and Ornithology** for the effect significance and required mitigation measures for air quality impacts on ecological receptors.		
AQ-C-04	Construction vessel emissions – exhaust emissions from nearshore vessel movements associated with construction activities	CO25	Onshore sensitive ecological receptors within vicinity of the Project's nearshore vessel movements.	Not applicable as impacts not assessed. Evidence provided demonstrating absence of likely significant effect.					

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Receptor Sensitivity	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
Operation and Maintenance									
AQ-O-02	Operational NRMM and backup generator emissions - exhaust emissions from routine and unplanned maintenance activities and backup generators during operation	N/A	Human and ecological receptors in close proximity to where NRMM works would occur.	Not applicable as impacts from operational NRMM and emergency back up generator emissions not assessed. Evidence provided demonstrating absence of likely significant effect.					
AQ-O-03	Operational road vehicle exhaust emissions - exhaust emissions from road vehicle movements during operation	CO102	Residential properties, schools, hospitals and care homes within 200m of affected roads.	Not applicable as impacts not assessed. Evidence provided demonstrating absence of likely significant effect.					
AQ-O-04	Operational vessel emissions - exhaust emissions from nearshore vessel movements during operation	CO25	Onshore sensitive ecological receptors within vicinity of the Project's nearshore vessel movements.	Not applicable as impacts not assessed. Evidence provided demonstrating absence of likely significant effect.					
Decommissioning									
AQ-D-01	Decommissioning dust and fine particulate matter emissions - decommissioning activities not yet defined	CO56	The details and scope of onshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Onshore Decommissioning Plan (see **Table 20-7**, Commitment ID CO56). This will include a detailed assessment of decommissioning impacts and appropriate mitigation measures to avoid significant effects. For this assessment, it is assumed that impacts during the decommissioning phase would be of similar nature to, and no worse than, those identified during the construction phase.						
AQ-D-02	Decommissioning NRMM emissions - decommissioning activities not yet defined								
AQ-D-03	Decommissioning road vehicle exhaust emissions - decommissioning activities not yet defined								

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List of Acronyms

Acronym	Definition
AADT	Average Annual Daily Trips
ADMS-Roads	Atmospheric Dispersion Modelling System for Roads
APIS	Air Pollution Information System
AQMA	Air Quality Management Area
AQMP	Air Quality Management Plan
AW	Ancient Woodland
CAS	Clean Air Strategy
CEA	Cumulative Effects Assessment
CEH	Centre for Ecology and Hydrology
CLRTAP	Convention on Long-range Transboundary Air Pollution
CoCP	Code of Construction Practice
CTMP	Construction Traffic Management Plan
DBD	Dogger Bank D Offshore Wind Farm
DCO	Development Consent Order
DPF	Diesel Particulate Filters
EFT	Emission Factor Toolkit
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
HDD	Horizontal Directional Drilling
HGV	Heavy Good Vehicle
IAQM	Institute of Air Quality Management
IRZ	Impact Risk Zone
LAQM	Local Air Quality Management
LNR	Local Nature Reserve
MW	Megawatts
NO_2	Nitrogen Dioxide
NO_X	Oxides of Nitrogen
NPS	National Policy Statement
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Projects
OCoCP	Outline Code of Construction Practice
PAMP	Port Access Management Plan(s)
PEIR	Preliminary Environmental Information Report
PM_{10}	Particulate Matter
RMSE	Root Mean Square Error
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
TEMPro	Trip End Model Presentation Program
TJB	Transition Joint Bay
TG (22)	Technical Guidance 2022