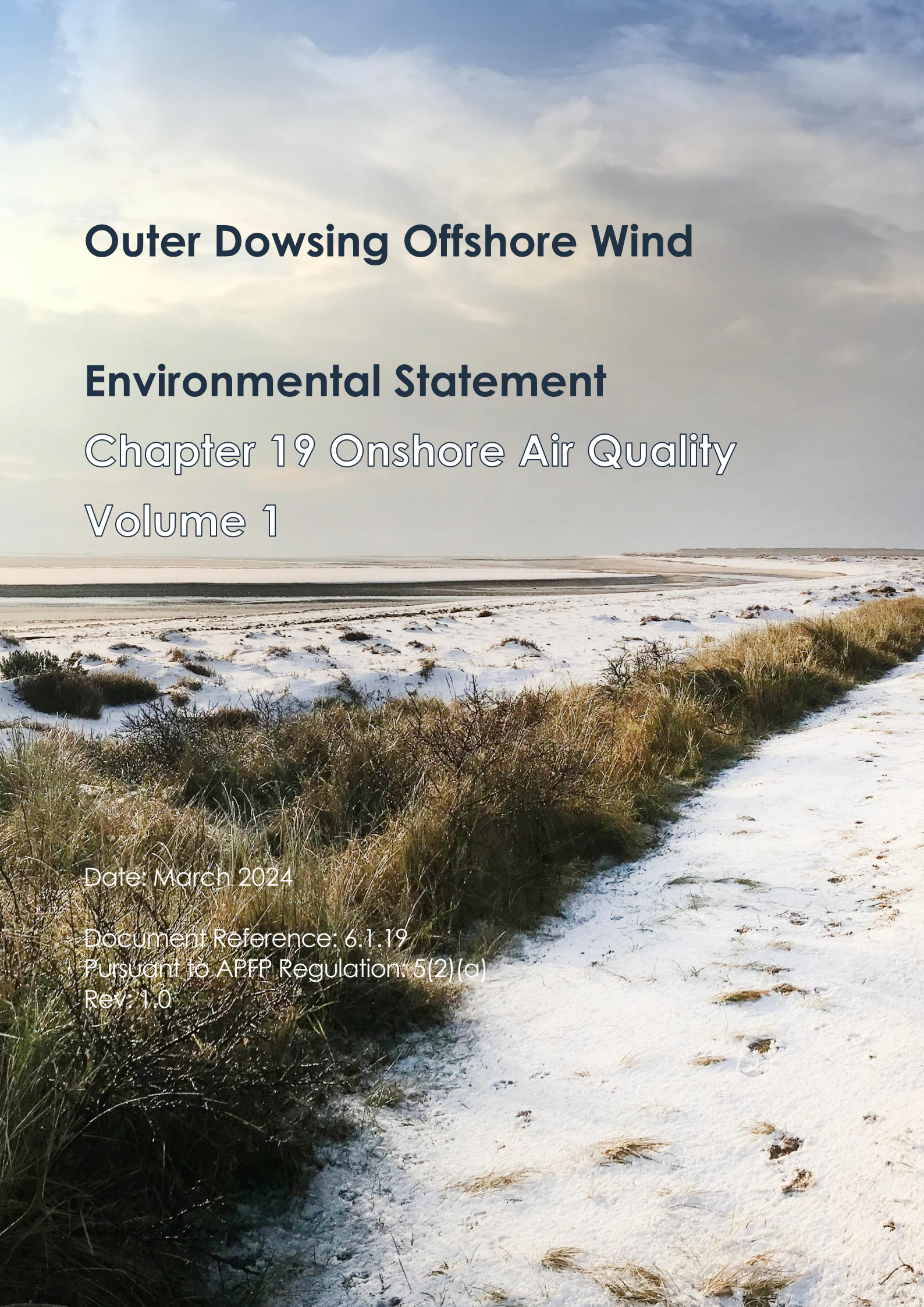

Outer Dowsing Offshore Wind

Environmental Statement

Chapter 19 Onshore Air Quality

Volume 1

Date: March 2024

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Acronyms & Terminology

Abbreviations / Acronyms

Abbreviation / Acronym	Description
AADT	Annual Average Daily Traffic
AIL	Abnormal Indivisible Loads
AoS	Area of Search
APIS	Air Pollution Information System
AQAL	Air Quality Assessment Level
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQMP	Air Quality Management Plan
AQS	Air Quality Strategy
AQSR	Air Quality Standards Regulations
ASR	Annual Status Report
AW	Ancient Woodland
BAEF	Boston Alternative Energy Facility
BBC	Boston Borough Council
BC	Base Case
CEA	Cumulative Effects Assessment
CERC	Cambridge Environmental Research Consultants
CoCP	Code of Construction Practice
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do Minimum
DMRB	Design Manual for Roads and Bridges
DS	Do Something
ECA	Emission Control Area
ECC	Export Cable Corridor
EFT	Emissions Factors Toolkit
EIA	Environmental Impact Assessment
ELDC	East Lindsey District Council
EPA	Environmental Protection Act
EPP	Evidence Plan Process
EPUK	Environmental Protection UK
ES	Environmental Statement
ETG	Expert Topic Group
EU	European Union
HDV	Heavy-Duty Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LCC	Lincolnshire County Council
LDV	Light-Duty Vehicle

Abbreviation / Acronym	Description
LNR	Local Nature Reserve
LPA	Local Planning Authority
LWS	Local Wildlife Site
LWT	Lincolnshire Wildlife Trust
MARPOL	The International Convention for the Prevention of Pollution from Ships
MDS	Maximum Design Scenario
N/A	Not Applicable
NFU	National Farmers Union
NGR	National Grid Reference
NGSS	National Grid Substation
NKDC	North Kesteven District Council
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
O&M	Operation and Maintenance
ODOW	Outer Dowsing Offshore Wind (The Project)
OnSS	Onshore Substation
PC	Process Contribution
PEC	Predicted Environmental Concentration
PEIR	Preliminary Environmental Information Report
PPG	National Planning Practice Guidance
RWC	Realistic Worst Case
SAC	Special Area of Conservation
SHDC	South Holland District Council
SoS	Secretary of State
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TJB	Transition Joint Bay
UK	United Kingdom
WTG	Wind Turbine Generator
ZoI	Zone of Influence

Terminology

Term	Definition
400kV cable corridor	The 400kV cable corridor is the area within which the 400kV cables connecting the onshore substation to the NGSS will be situated.
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, TotalEnergies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
Array area	The area offshore within which the generating station (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling will be positioned.
Baseline	The status of the environment at the time of assessment without the development in place.
Connection Area	An indicative search area for the NGSS.
Cumulative effects	The combined effect of the Project acting additively with the effects of other developments, on the same single receptor/resource.
Cumulative impact	Impacts that result from changes caused by other past, present or reasonably foreseeable actions together with the Project.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the sensitivity of the receptor, in accordance with defined significance criteria.
EIA Directive	European Union 2011/92/EU (as amended by Directive 2014/52/EU).
EIA Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Environmental Impact Assessment (EIA)	A statutory 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, which fulfils the assessment requirements of the EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	The suite of documents that detail the processes and results of the EIA.
Evidence Plan	A voluntary process of stakeholder consultation with appropriate Expert Topic Groups (ETGs) that discusses and, where possible, agrees the detailed approach to the Environmental Impact Assessment (EIA) and information to support Habitats Regulations Assessment (HRA) for those relevant topics included in the process, undertaken during the pre-application period.

Term	Definition
Export cables	High voltage cables which transmit power from the Offshore Substations (OSS) to the Onshore Substation (OnSS) via an Offshore Reactive Compensation Platform (ORCP) if required, which may include one or more auxiliary cables (normally fibre optic cables).
Habitats Regulations Assessment (HRA)	A process which helps determine likely significant effects and (where appropriate) assesses adverse impacts on the integrity of European conservation sites and Ramsar sites. The process consists of up to four stages of assessment: screening, appropriate assessment, assessment of alternative solutions and assessment of imperative reasons of over-riding public interest (IROPI) and compensatory measures.
Haul Road	The track within the onshore Order Limits which the construction traffic would use to facilitate construction.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Intertidal	The area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS)
Joint bays	An excavation formed with a buried concrete slab at sufficient depth to enable the jointing of high voltage power cables.
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.
Maximum Design Scenario	The project design parameters, or a combination of project design parameters that are likely to result in the greatest potential for change in relation to each impact assessed.
Mitigation	Mitigation measures are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
National Grid Onshore Substation (NGSS)	The National Grid substation and associated enabling works to be developed by the National Grid Electricity Transmission (NGET) into which the Project's 400kV Cables would connect.
National Policy Statement (NPS)	A document setting out national policy against which proposals for Nationally Significant Infrastructure Projects (NSIPs) will be assessed and decided upon.
Onshore Export Cable Corridor (ECC)	The Onshore Export Cable Corridor (Onshore ECC) is the area within which the export cables running from the landfall to the onshore substation will be situated.
Onshore Infrastructure	The combined name for all onshore infrastructure associated with the Project from landfall to grid connection.
Onshore substation (OnSS)	The Project's onshore HVAC substation, containing electrical equipment, control buildings, lightning protection masts, communications masts, access, fencing and other associated equipment, structures or buildings; to enable connection to the National Grid.

Term	Definition
Outer Dowsing Offshore Wind (ODOW)	The Project.
Order Limits	The area subject to the application for development consent. The limits shown on the works plans within which the Project may be carried out.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Pre-construction and post-construction	The phases of the Project before and after construction takes place.
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft Environmental Statement (ES) and provided information to support and inform the statutory consultation process during the pre-application phase.
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.
Project Design Envelope	A description of the range of possible elements that make up the Project's design options under consideration, as set out in detail in the project description. This envelope is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
Statutory consultee	Organisations that are required to be consulted by the Applicant, the Local Planning Authorities and/or The Planning Inspectorate during the pre-application and/or examination phases, and who also have a statutory responsibility in some form that may be relevant to the Project and the DCO application. This includes those bodies and interests prescribed under Section 42 of the Planning Act 2008.
Study area	Area(s) within which environmental impact may occur – to be defined on a receptor-by-receptor basis by the relevant technical specialist.
Transition Joint Bay (TJBs)	The offshore and onshore cable circuits are jointed on the landward side of the sea defences/beach in a Transition Joint Bay (TJB). The TJB is an underground chamber constructed of reinforced concrete which provides a secure and stable environment for the cable.
Trenchless technique	Trenchless technology is an underground construction method of installing, repairing and renewing underground pipes, ducts and cables using techniques which minimize or eliminate the need for excavation. Trenchless technologies involve methods of new pipe installation with minimum surface and environmental disruptions. These techniques may include Horizontal Directional Drilling (HDD), thrust boring, auger boring, and pipe ramming, which allow ducts to be installed under an obstruction without breaking open the ground and digging a trench.

Term	Definition
Wind turbine generator (WTG)	A structure comprising a tower, rotor with three blades connected at the hub, nacelle and ancillary electrical and other equipment which may include J-tube(s), transition piece, access and rest platforms, access ladders, boat access systems, corrosion protection systems, fenders and maintenance equipment, helicopter landing facilities and other associated equipment, fixed to a foundation.

Reference Documentation

Document Number	Title
6.1.3	Project Description
6.1.4	Site Selection and Alternatives
6.1.5	EIA Methodology
6.1.15	Shipping and Navigation
6.1.21	Onshore Ecology
6.1.27	Traffic and Transport
6.3.5.3	Onshore Cumulative Effects Assessment Approach
6.3.19.1	Construction Dust Assessment Methodology
6.3.19.2	Non-Road Mobile Machinery (NRMM) Emissions Assessment
6.3.19.3	Offshore Activities Assessment
6.3.19.4	Road Traffic Dispersion Modelling
8.1.2	Outline Air Quality Management Plan

19 Onshore Air Quality

19.1 Introduction

1. This chapter of the Environmental Statement (ES) presents the Environmental Impact Assessment (EIA) process and results, for the potential impacts of Outer Dowsing Offshore Wind ("the Project") on Onshore Air Quality. This chapter considers the potential impact of the onshore elements of the Project including the landfall, the Onshore Export Cable Corridor (ECC) and 400kV cable corridor, and the Onshore substation (OnSS) during the construction, operation and maintenance, and decommissioning phases.
2. The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm) located approximately 54km from the Lincolnshire coastline, export cables to landfall, onshore cables, an onshore substation, connection to the electricity transmission network, and ancillary and associated development (see Volume 1, Chapter 3: Project Description 6.1.3 for full details).
3. This chapter is supported by, and summarises, the information contained within the following technical Appendices in Volume 3:
   - Appendix 19.1: Construction Dust Assessment Methodology;
   - Appendix 19.2: Non-Road Mobile Machinery (NRMM) Emissions Assessment;
   - Appendix 19.3: Offshore Activities Assessment; and
   - Appendix 19.4: Road Traffic Dispersion Modelling.
4. This chapter should be read alongside the following chapters and documents:
   - Volume 1, Chapter 3: Project Description;
   - Volume 1, Chapter 21: Onshore Ecology;
   - Volume 1, Chapter 27: Traffic and Transport; and
   - Document 8.1.2: Outline Air Quality Management Plan.

19.2 Statutory and Policy Context

19.2.1 Legislation

5. A dual set of regulations, separately applicable to National and Local Government, are currently operable within the UK in relation to air quality.

19.2.1.1 National Air Quality Obligations

6. The Air Quality Standards Regulations 2010 (AQSR) transpose both the European Union (EU) Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) into national legislation, and is the applicable legislation for air quality standards in England.
7. The AQSR includes limit values which are legally binding ambient concentration thresholds, applicable at specific locations (detailed in Schedule 1: AQSR). Compliance with limit values does not need to be assessed at the following locations: carriageways or central reservations of

roads except where there is normally pedestrian access to the central reservation, any location where the public do not have access and there is no fixed habitation, and on factory premises or at industrial locations to which all relevant provisions concerning health and safety at work apply. On this basis, if a sampling point does not comply with the siting locations, then strict comparison to the AQSR limit values cannot be made. The responsibility of achieving the AQSR is a National obligation for Central Government who undertake assessments on an annual basis.

8. Following the UK's withdrawal from the EU, the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 made amendments to existing retained EU law relating to air quality, to ensure they continue to operate effectively after the transition period. As a result, the fine particulate matter ($PM_{2.5}$) Limit Value was reduced to 20µg/m^3.
9. In addition, the Environment Act 2021 set two legally binding targets to reduce $PM_{2.5}$ concentrations:
   - An annual mean $PM_{2.5}$ concentration target of 10µg/m^3 across England by 2040; and
   - An average population exposure reduction target of 35% by 2040 compared to a 2018 baseline.

19.2.1.2 Local Air Quality Obligations

10. Part IV of the Environment Act 1995 (as amended by the Environment Act 2021) requires the Secretary of State to review the national Air Quality Strategy (AQS) every five years and modify this if required. It also established the system of Local Air Quality Management (LAQM) for Local Authorities to regularly review and assess air quality within their respective administrative areas.
11. The Air Quality (England) Regulations 2000 (as amended) provide the statutory basis for the Air Quality Objectives Local Authorities must adhere to under LAQM in England. $PM_{2.5}$ is not currently part of the LAQM framework; however, as per the national AQS, Local Authorities are required to work towards reducing $PM_{2.5}$.
12. The Air Quality Objectives apply at locations which are situated outside of buildings or other natural or man-made structures above or below ground and where members of the public are regularly present, and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period (referred to as 'relevant exposure').
13. Table 19.2 provides an indication of those locations. Where any of the prescribed Air Quality Objectives are not likely to be achieved, the authority must designate an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to prepare an Air Quality Action Plan (AQAP), which details measures the authority intends to introduce to deliver improvements in local air quality and achieve compliance.
14. The latest AQS for England was published in 2023 (Defra, 2023a). The AQS provides the delivery framework for air quality management across England for local authorities and summarises the air quality standards and objectives operable within England for the protection of public health and the environment.
15. The ambient air quality objectives of relevance to this assessment (collectively termed Air

Quality Assessment Levels (AQALs) throughout this chapter) are provided in Table 19.1. These are primarily based upon the Air Quality Objectives Local Authorities are responsible for achieving. The $PM_{2.5}$ AQSR AQAL has also been included for completeness.

Table 19.1 Relevant Ambient AQALs

Pollutant	AQAL (µg/m^3)	Averaging Period
Nitrogen Dioxide (NO_2)	200	1-hour mean not to be exceeded more than 18 times a year
	40	Annual mean
Particulate Matter (PM_{10})	50	24-hour mean not to be exceeded more than 35 times a year
	40	Annual mean
Particulate Matter ($PM_{2.5}$)	20	Annual mean

Table 19.2 Human Health Relevant Exposure

Averaging Period	AQALs should apply at	AQALs should not apply at
Annual mean	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term
1-hour mean	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

19.2.1.3 General Nuisance Legislation

16. Part III of the Environmental Protection Act (EPA) 1990 (as amended) contains the main legislation on statutory nuisance and allows local authorities and individuals to take action to prevent a statutory nuisance. Section 79 of the EPA defines smoke, fumes, dust, and smells emitted from industrial, trade, or business premises, which is harmful to health or a nuisance, as a potential statutory nuisance.
17. Fractions of dust greater than 10µm (i.e., greater than PM10) in diameter typically relate to nuisance effects as opposed to potential health effects. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

19.2.1.4 Designated Ecological Sites

18. Ecological habitats vary in regard to their sensitivity, perceived ecological value, geographic importance, and level of protection. Within the UK, there are three types of nature conservation designations: international, national, and local.
19. In the UK, sites of ecological importance are provided environmental protection from activities with respect to air quality through the application of standards known as Critical Levels and

Critical Loads, as presented in Table 19.3. The annual mean Critical Level presented for oxides of nitrogen (NOx) is prescribed in the Air Quality Standards Regulations 2010. Eutrophication and acidification Critical Loads are site/location specific dependant on habitat type and/or soil chemistry and are provided on the Air Pollution Information System (APIS) – a support tool for assessment of potential effects of air pollutants on habitats and species developed in partnership by the UK conservation agencies and regulatory agencies and the Centre for Ecology and Hydrology.

Table 19.3 Relevant Ecological AQALs

Type	Pollutant	AQAL (µg/m^3)	Measured as
Critical Level	NO_x	30	Annual mean
Critical Load	Eutrophication	Site Specific	Annual mean
	Acidification	Site Specific	Annual mean

20. The EU Habitats Directive (The Council of European Communities, 1992) requires member states to introduce a range of measures for the protection of habitats and species. This requirement was transposed into UK legalisation by The Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations'). These regulations were subsequently amended in 2019 to make them operable from 1 January 2021 despite the UK's withdrawal from the EU.
21. The Habitats Regulations introduces the precautionary principle for protected European sites, i.e., that plans or projects can only be permitted to proceed; having ascertained that there will be no adverse effect on the integrity of the designated site. It requires an assessment to determine if significant effects are likely, followed by an 'appropriate assessment' by the competent authority, if necessary.
22. However, should an adverse effect from a plan or project be determined, a derogation is provided in the regulations which allows such plans or projects to be approved provided the following three conditions are met:
    - There are no feasible alternative solutions which are less damaging;
    - There are "imperative reasons of overriding public interest" (IROPI); and
    - Compensatory measures are secured.
23. European sites include Special Areas of Conservation (SAC) and Special Protection Areas (SPA), previously termed the Natura 2000 network, and now collectively called the national site network.
24. Other sites of international significance are Ramsar sites, which are wetlands protected under the Ramsar Convention. Many of these sites in the UK were initially selected due to their importance to waterbirds and are therefore also classified as SPAs.
25. The Countryside and Rights of Way Act 2000 also provides protection to Ramsar sites and Sites of Special Scientific Interest (SSSI) to ensure that developments are not likely to cause damage. This act also provides a degree of protection to local nature conservation sites, which can be particularly important in providing 'buffers' to SSSIs and International sites.

19.2.2 National Policy

19.2.2.1 National Planning Policy

26. The 2023 update to the National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing & Communities, 2023) sets out planning policy for England.
27. The NPPF states that the planning system should contribute to and enhance the natural and local environment, by preventing new development from contributing to or being adversely affected by unacceptable concentrations of air pollution.
28. The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019) which includes guiding principles on how planning can take account of the impacts of new development on air quality.

19.2.2.2 National Policy Statements

29. The National Policy Statements (NPS) are a series of principal decision-making documents to appropriately assess Nationally Significant Infrastructure Projects (NSIPs). As such, this assessment has made explicit reference to the relevant NPS requirements. The current NPS were published in November 2023 and came into force on 17 January 2024.
30. Those relevant to the Project are:
    - NPS for Overarching Energy (EN-1);
    - NPS for Renewable Energy Infrastructure (EN-3); and
    - NPS for Electricity Networks Infrastructure (EN-5).
31. Details of the current policies of relevance to this assessment are provided in Table 19.4 together with an indication of where each requirement is addressed. Where any part of the NPS has not been followed, an explanation as to why the requirement is not deemed relevant, or has been met in another manner, is provided.
32. EN-3 and EN-5 do not specifically include details on the assessment of air quality in the context of offshore wind developments.

19.2.3 Local Policy

19.2.3.1 East Lindsey

33. The East Lindsey Local Plan was adopted by East Lindsey District Council (ELDC) on 18 July 2018. The Core Strategy (ELDC, 2018) is a key Local Plan document; however, it does not contain any policies relating specifically to air quality.

19.2.3.2 South East Lincolnshire

34. The South East Lincolnshire Joint Strategic Planning Committee is a partnership between Boston Borough Council (BBC), South Holland District Council (SHDC), and Lincolnshire County Council (LCC), who have prepared the South East Lincolnshire Local Plan 2011-2036 (BBC, SHDC and LCC, 2019). The Plan was adopted by BBC and SHDC on 8 March 2019. It contains Policy 30: Pollution which is of direct relevance to this chapter and has been considered in the assessment, as detailed in Table 19.4.

19.2.4 Guidance

35. The air quality assessment has been informed by the following guidance documents:

- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Institute of Air Quality Management (IAQM), 2020);
- COVID-19: Supplementary Guidance: Local Air Quality Management Reporting in 2021 (Defra and Greater London Authority, 2021);
- Critical Load Function Tool – Guidance (APIS, 2023);
- Design Manual for Roads and Bridges (DMRB) LA 105: Air Quality (National Highways, 2019);
- Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2016)[1];
- Land-Use Planning and Development Control: Planning for Air Quality (Environmental Protection UK (EPUK) & IAQM, 2017); and
- LAQM Technical Guidance (TG22) (LAQM.TG22) (Defra, 2022).

36. The relevant legislation and planning policy for offshore renewable energy Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to Onshore Air Quality, is outlined in Table 19.4 below.

[1] The guidance was originally released in 2014 (v1.0), then had a slight amendment in 2016 (v1.1), therefore the v1.1 is referenced throughout.

Table 19.4 Legislation and Policy Context

Legislation/policy	Key provisions	Section where comment addressed
Legislation		
The Air Quality Standards Regulations 2010 (2010)	Includes statutory limit values for the protection of human health and the environment.	The numerical limit values for the protection of human health and the environment have been considered within the assessment, where relevant, as presented in Table 19.1. See Sections 19.4 to 19.9.
The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (2020)	Introduced to mirror revisions to retained EU law in the field of air quality. As a result, the fine particulate matter ($PM_{2.5}$) Limit Value was reduced to 20µg/m^3.	Sections 19.4 to 19.9.
Environment Act 1995 (1995) (as amended)	Introduced the requirement for the UK Government and the Devolved Administrations to produce a national air quality strategy to improve air quality, and the statutory duty for local authorities to undergo a process of LAQM.	Sections 19.4 to 19.9.
The Air Quality (England) Regulations 2000 (as amended)	Provides the statutory basis for the Air Quality Objectives Local Authorities must adhere to under in England.	Sections 19.4 to 19.9.
Environmental Protection Act 1990 (1990)	Includes the main legislation on statutory nuisance and defines what constitutes a potential statutory nuisance, including dust.	Sections 19.4 to 19.9.
Habitats Regulations 2017 (as amended) (2017)	Sets out decision making procedures for the protection of SACs and SPAs. It requires an assessment to determine if significant effects are likely, followed by an 'appropriate assessment' by the competent authority, if necessary.	Sections 19.4 to 19.9.
Countryside and Rights of Way Act 2000 (CRoW) (2000)	Part III includes provision for the protection of SSSIs (Schedule 9) and Ramsar sites.	Sections 19.4 to 19.9.
National Policy		
The Air Quality Strategy for England (AQS) (2023)	Includes the national air quality objectives for the protection of public health and the environment – presented in Table 19.1.	Sections 19.4 to 19.9.

Legislation/policy	Key provisions	Section where comment addressed
National Planning Policy		
NPS EN-1 (2023)	Paragraphs 5.2.1 to 5.2.3 of EN-1 states: 5.2.1 Energy infrastructure development can have adverse effects on air quality. The construction, operation and decommissioning phases can involve emissions to air which could lead to adverse impacts on health, on protected species and habitats, or on the wider countryside and species. Air emissions include particulate matter (for example dust) up to a diameter of ten microns (PM_{10}) and up to a diameter of 2.5 microns ($PM_{2.5}$), as well as gases such as sulphur dioxide, carbon monoxide and nitrogen oxides (NO_x). 5.2.2 Legal limits for pollutants in ambient air are set out in the Air Quality Standards Regulations 2010 and for England, national objectives set out in the Air Quality (England) Regulations 2000 reiterated in the Air Quality Strategy, or for Wales, the Air Quality (Wales) Regulations 2000 and the Clean Air Plan for Wales. In addition, two fine particulate matter ($PM_{2.5}$) targets were set under the Environment Act 2021 for England – an annual mean concentration target and a population exposure target. Internationally agreed emissions commitments are set in the National Emission Ceilings Regulations 2018 and establish limits for total UK emissions of key pollutants. 5.2.3 For many air pollutants there is not a threshold below which there is no health impact so it is important that energy infrastructure schemes consider not just how a scheme may impact statutory air quality limits, objectives or targets but also measures to mitigate all emissions in order to minimise human	Sections 19.4 to 19.9.

Legislation/policy	Key provisions	Section where comment addressed
	exposure to air pollution, especially for those who are more susceptible to the impacts of poor air quality. Paragraph 5.2.9 of EN-1 states that an ES should describe: ▪ existing air quality concentrations and the relative change in air quality from existing levels; ▪ any significant air quality effects, mitigation action taken 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. In relation to mitigation, EN-1 states: 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 non-compliant 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. 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	

Legislation/policy	Key provisions	Section where comment addressed
	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. In regard to the Secretary of State decision making, EN-1 states: 5.2.15 Many activities involving air emissions are subject to pollution control. The considerations set out in Section 4.12 on the interface between planning and pollution control therefore apply. The Secretary of State must also consider duties under other legislation including duties under the Environment Act 2021 in relation to environmental targets and have regard to policies set out in the Government's Environmental Improvement Plan 2023. 5.2.16 The Secretary of State should give air quality considerations substantial weight where a project would lead to a deterioration in air quality. This could for example include where an area breaches any national air quality limits or statutory air quality objectives. However, air quality considerations will also be important where substantial changes in air quality levels are expected, even if this does not lead to any breaches of statutory limits, objectives or targets. 5.2.17 The Secretary of State should give air quality considerations substantial weight where a project is proposed near a sensitive receptor site, such as an education or healthcare facility, residential use or a sensitive or protected habitat. 5.2.18 Where a project is proposed near to a sensitive receptor site for air quality, if the applicant cannot provide justification for this location, and a suitable mitigation plan, the Secretary of State should refuse consent.	

Legislation/policy	Key provisions	Section where comment addressed
	5.2.19 In all cases, the Secretary of State must take account of any relevant statutory air quality limits, objectives and targets. If a project will lead to non-compliance with a statutory limit, objective or target the Secretary of State should refuse consent.	
NPPF (2023)	Chapter 15 (Conserving and Enhancing the Natural Environment) states the following in specific relation to air quality: "*Planning policies and decisions should contribute to and enhance the natural and local environment by*: *[…]* *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of […] air […] pollution […]. Development should, wherever possible, help to improve local environmental conditions such as air […] quality […]*" "*Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.*"	Existing environment discussed in Section 19.4. See Section 19.8 for assessment of impacts. See Document 8.1.2: Outline Air Quality Management Plan for details regarding mitigation measures.
PPG (2019)	In regard to air quality, the PPG states:	Existing environment discussed in Section 19.4.

Legislation/policy	Key provisions	Section where comment addressed
	"*The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with relevant Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified.*" "*Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity.*" The PPG sets out the information that may be required within the context of a supporting air quality assessment, stating that: "*Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific. […] Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact.*"	See Section 19.8 for assessment of impacts. See Document 8.1.2: Outline Air Quality Management Plan for details regarding mitigation measures.
Local Planning Policy		
South East Lincolnshire Local Plan 2011-2036 (2019)	Policy 30: Pollution states: "*Development proposals will not be permitted where, taking account of any proposed mitigation measures, they would lead to unacceptable adverse impacts upon:*	Policy 30: Pollution is considered in Sections 19.4 to 19.9.

Legislation/policy	Key provisions	Section where comment addressed
	1. *health and safety of the public;* 2. *the amenities of the area; or* 3. *the natural, historic and built environment;* *by way of:* 4. *air quality, including fumes and odour;* *[…]* *Planning applications, except for development within the curtilage of a dwelling house as specified within Schedule 2, Part 1 of The Town and Country Planning (General Permitted Development) (England) Order 2015, or successor statutory instrument, must include an assessment of:* 9. *impact on the proposed development from poor air quality from identified sources;* 10. *impact on air quality from the proposed development; and* 11. *impact on amenity from existing uses.* *Suitable mitigation measures will be provided, if required. Proposals will be refused if impacts cannot be suitably mitigated or avoided.* *Development proposals on contaminated land, or where there is reason to suspect contamination, must include an assessment of the extent of contamination and any possible risks. Proposals will not be considered favourably unless the land is, or can be made, suitable for the proposed use.*"	

19.3 Consultation

37. Consultation is a key part of the Development Consent Order (DCO) application process. Consultation regarding Onshore Air Quality has been conducted through the following processes:
    - Evidence Plan Process (EPP) including Expert Topic Group (ETG) meetings;
    - EIA scoping process (ODOW, 2022);
    - Bilateral engagement with relevant stakeholders;
    - Section 47 consultation process (all public consultation phases including phase 1 and 1a); and
    - Section 42 consultation process (Phase 2 Consultation, the Autumn Consultation and the Targeted Winter Consultation).
38. An overview of the Project's consultation process with reference to technical considerations is presented within Volume 1, Chapter 6: Technical Consultation (document reference 6.1.6). Further information on the Project's consultation phases can be found in the Project's Consultation Report (document reference 5.1).
39. A summary of the key issues raised during consultation to date, specific to Onshore Air Quality, is outlined in Table 19.5 below, together with how these issues have been considered in the production of this ES.

Table 19.5 Summary of Consultation Relating to Onshore Air Quality

Date	Consultation and key comments	Section where comment addressed
Scoping Opinion Comments		
September 2022	**The Planning Inspectorate, Scoping Opinion (ID 3.13.1):** *NRMM emissions during construction:* As per the Scoping Report (Outer Dowsing Offshore Wind, 2022), it was initially proposed to scope out impacts associated with emissions generated from NRMM used during the construction phase. This was based on advice provided within Defra's LAQM.TG22 (Defra, 2022) which states that providing suitable controls are applied, emissions generated from NRMM are unlikely to contribute to a significant impact upon local air quality. A series of controls were included within the Scoping Report (Outer Dowsing Offshore Wind, 2022). However, The Planning Inspectorate recommended that an assessment of emissions generated from NRMM used during construction should be undertaken.	A qualitative assessment of construction phase NRMM emissions was published in the PEIR and has been updated for the ES. See Section 19.8 and Volume 3, Appendix 19.2: NRMM Emissions Assessment.
September 2022	**The Planning Inspectorate, Scoping Opinion (ID 3.13.2):** *Offshore vessel emissions during construction:* As per the Scoping Report (Outer Dowsing Offshore Wind, 2022), it was initially proposed to scope out impacts associated with emissions from offshore vessel movements during the construction phase. This was based on the strict emission controls which are implemented in the North Sea, which is an Emission Control Area (ECA), and the low proportion of overall shipping traffic which movements associated with the Project would represent.	An assessment of offshore activities was published in the PEIR and has been updated for the ES. This includes consideration of offshore vessel movements generated by the construction phase. See Section 19.8 and Volume 3, Appendix 19.3: Offshore Activities Assessment.

Date	Consultation and key comments	Section where comment addressed
	However, The Planning Inspectorate recommended that an assessment of emission generated from offshore vessels used during construction should be undertaken for sensitive human and/or ecological receptors.	
September 2022	**The Planning Inspectorate, Scoping Opinion (ID 3.13.3):** *Operational phase traffic movements:* The Planning Inspectorate agreed that road traffic movements generated by operational activities are unlikely to cause significant effects on air quality. However, to validate this, the Planning Inspectorate requested comparison of operation and maintenance (O&M) flows to screening criteria set out in the EPUK & IAQM guidance.	Road traffic movements generated by operational activities have been presented and compared against EPUK & IAQM screening criteria. See Section 19.8.
September 2022	**The Planning Inspectorate, Scoping Opinion (ID 3.13.4):** *Offshore vessel emissions during operation:* The Planning Inspectorate agreed that this matter can be scoped out of further assessment.	No action needed.
September 2022	**The Planning Inspectorate, Scoping Opinion (ID 3.13.5):** *Decommissioning phase traffic movements and other works:* The Planning Inspectorate requested further information about the nature and scale of possible decommissioning activities. Specifically, an assessment of decommissioning phase traffic movements and other works, where likely significant effects could occur.	As per the Planning Inspectorate's request, further information of potential decommissioning impacts is provided in Section 19.5. For the reasons provided, it is not considered appropriate to assess, in detail, decommissioning activities at this stage. A Decommissioning Plan (considered embedded mitigation – Table 19.12) would be finalised nearer to the end of the lifetime of the Project, to be in line with current guidance, policy and legislation. Furthermore, decommissioning activities are not anticipated to exceed the construction phase worst-case criteria assessed for each impact.

Date	Consultation and key comments	Section where comment addressed
		However, qualitative consideration has been given to the extent of potential decommissioning impacts through consideration of the construction phase assessment outcomes – to determine whether further assessment is required, Section 19.8.
September 2022	**The Planning Inspectorate, Scoping Opinion (ID 3.13.6):** *Cumulative dust and PM_{10} during construction:* The Planning Inspectorate noted that at present, there is a lack of detail regarding the extent of committed developments and projects/plans that will be considered within the Cumulative Effects Assessment (CEA). As such, they could not agree for this matter to be scoped out.	A CEA has been undertaken and is presented in Section 19.9. This has included consideration of cumulative dust and PM_{10} during construction.
September 2022	**The Planning Inspectorate, Scoping Opinion (ID 3.13.7):** *Transboundary effects:* The Planning Inspectorate agreed that this matter can be scoped out of further assessment.	No action needed.
September 2022	**The Planning Inspectorate, Scoping Opinion (ID 3.13.8):** *Study area:* The Planning Inspectorate requested for the ES to include appropriate figures to identify key elements of the study area and assessments.	Figures are provided for each element of the air quality assessment. These are presented in Volume 2, Figure 19.1 to 19.5: ▪ Figure 19.1: Air Quality Monitoring Locations; ▪ Figure 19.2: Modelled Road Network and Human Receptors; ▪ Figure 19.3: Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network; ▪ Figure 19.4: Non-Road Mobile Machinery Emissions Affected Areas; and ▪ Figure 19.5: Vessel Emissions Affected Areas.

Date	Consultation and key comments	Section where comment addressed
September 2022	**The Planning Inspectorate, Scoping Opinion (ID 3.13.9):** *Project-specific air quality surveys:* As per the Scoping Report (Outer Dowsing Offshore Wind, 2022), it was initially proposed to establish the air quality baseline using publicly available sources, such as Defra background mapping and local monitoring data. This approach was noted by The Planning Inspectorate within the Scoping Opinion. The Planning Inspectorate recommended that the suitability of these publicly available datasets be reviewed throughout the EIA lifecycle upon refinement of the onshore ECC, and the suitability/use of the datasets, or the requirement for a project-specific survey, be confirmed with the relevant consultation bodies.	Following finalisation of the Order Limits and assessment inputs (e.g., traffic data), the suitability of the publicly available data has been reviewed. Consistent with the approach outlined within the Scoping Report (Outer Dowsing Offshore Wind, 2022) and adopted for the PEIR, publicly available datasets (not impacted by the COVID-19 pandemic) have been used to characterise the baseline receiving environment. See Section 19.4 for further information. For the road traffic emissions assessment, suitable baseline monitoring locations (Section 19.4) are found adjacent to the affected road network and have been used for the purposes of model verification. Use of publicly available datasets has been discussed with statutory consultees during the EPP ETG meetings – whereby no comments/responses have been raised. Furthermore, no comments were raised during the Section 42 consultation.
September 2022	**The Planning Inspectorate, Scoping Opinion (ID 3.13.10):** *Assessment of in-combination effects on national and local designated ecological sites:* The Planning Inspectorate noted that at present, there is insufficient detail on the extent of onshore elements of the Project to scope out significant air quality effects on nationally or locally designated sites cumulatively with other projects or plans. It was recommended that this should be included in the assessment where likely significant effects could occur.	In accordance with the Habitats Regulations, screening of in-combination effects is required for internationally designated sites. Furthermore, following a review of consultation comments provided by Natural England on other projects, screening of in-combination effects is requested for national (SSSI) designations, in additional to international sites. The in-combination assessment therefore typically includes international sites and SSSIs only, and the inclusion of locally designated sites is not necessarily standard assessment procedure. In recognition of the scoping comments received from The Planning Inspectorate, screening of road traffic movements generated by the Project has been undertaken in-combination

Date	Consultation and key comments	Section where comment addressed
		with relevant committed developments and live projects/plans (based upon available information) for all designated ecological sites. This screening process is documented in Section 19.8. This approach provides an understanding of potential in-combination effects across all designated ecological sites.
Phase 2 Consultation (Section 42 consultation on the PEIR) Comments		
July 2023	**East Lindsey District Council, Boston Borough Council and South Holland District Council** All stated that the following measures should be complied with during the construction phase: ▪ Burning of waste should be avoided. Any burning of waste deemed strictly necessary should be undertaken in accordance with the relevant waste management exemption issued by the Environment Agency, and consideration should be given to the timing of such burning, and the prevailing weather conditions to impact emissions to air and nuisance to offsite receptors; and ▪ Soil stockpiles should be sealed to reduce fugitive dust emissions.	These measures are included within the Outline Air Quality Management Plan (Document 8.1.2). Furthermore, soils will be handled and managed in line with the Outline Soil Management Plan (Document 8.1.3). Both outline plans form part of the Outline Code of Construction Practice (CoCP), the implementation of which is secured as a requirement of the DCO.
July 2023	**National Farmers' Union** Raised concerns regarding potential dust impacts on high value vegetable crops during the construction phase. Stated that the control of dust, especially from the haul roads, must be identified in detail in the Outline CoCP.	Dust control measures, including those to prevent dust emissions from the haul roads and the trackout of mud from the construction areas, are included within the Outline Air Quality Management Plan (Document 8.1.2) which forms part of the Outline CoCP. A CoCP is a requirement of the DCO and considered embedded mitigation (Table 19.12). The requirement for a CoCP also secures the requirement for an Air Quality Management Plan and Soil Management Plan to be

Date	Consultation and key comments	Section where comment addressed
		submitted which will accord with the outline plans submitted for the ES (document reference 8.1).
July 2023	**Natural England** Provided the following comments within their Section 42 consultation response (Annex F – Onshore, NE ref: F3): ***Summary of Key Concerns*** <u>Air Quality</u> Natural England welcomes the project's commitment to comply with the Environment Agency's Air Quality Guidance for Developments and the precautious nature of the assessment of the impacts of dust from the development. We note that the project has stated that the critical load for nitrogen deposition caused by the project is not likely to be breached. Whilst we might agree that this is the likely conclusion, we cannot commit to this until we have seen the background values which contributed to this assessment. ***Natural England's Recommendations to Resolve Issues*** We would request that additional information on the background figures used to calculate critical loads for nitrogen deposition are included within the ES chapter for the air quality. We would expect to see, process contribution value, background concentration and predicted environmental concentrations. Each of which should be expressed as a percentage of the critical load.	The assessment with respect to sensitive ecological designations has been undertaken in accordance with the latest relevant guidance (Section 19.2.4). These documents were used for PEIR and remain unchanged. With respect to the construction road traffic dispersion modelling exercise, the pollutant process contribution (PC) has been predicted at each sensitive ecological designation requiring assessment (i.e. those located with the study area – see Section 19.4). Where relevant (i.e. at locations where the PC cannot be considered insignificant), the predicted environmental concentration (PEC) has been calculated. This includes the consideration of background datasets. Full details are provided in Volume 3, Appendix 19.4: Road Traffic Dispersion Modelling.

Date	Consultation and key comments	Section where comment addressed
Autumn Section 42 Consultation Comments		
November 2023	**Boston Borough Council and South Holland District Council** Both stated the following: "It is important that noise impacts are properly assessed and the management plans that will be a requirement by the DCO provide suitable protection from noise and dust impacts from installing the cable and storing soil during the process that satisfies the Environmental Health teams in BBC and SHDC."	The Outline Air Quality Management Plan (Document 8.1.2) details control measures which are required to prevent/avoid or reduce and mitigate potential impacts from construction dust. Furthermore, soils will be handled and managed in line with the Outline Soil Management Plan (Document 8.1.3). The plans form part of the CoCP, which is secured as a requirement of the DCO and will be approved by the relevant consultees.
Evidence Plan		
July 2022	ETG Presentation – No consultation feedback received.	-
October 2022	ETG Presentation – No consultation feedback received.	-
January 2023	ETG Presentation – No consultation feedback received.	-
March 2023	ETG Presentation – No consultation feedback received.	-
August 2023	ETG Presentation – No consultation feedback received.	-
September 2023	ETG Presentation – No consultation feedback received.	-

40. As stated in Volume 1, Chapter 3: Project Description and Volume 1, Chapter 4: Site Selection and Alternatives, the Project design envelope has been refined throughout the stages of the Project prior to DCO submission. This process has been reliant on stakeholder consultation feedback.
41. Design amendments to the cable routing, landfall, and OnSS location are of relevance to this chapter. Variation in these design elements, specifically in terms of their relative locations, influences the study area in terms of the sensitive receptor locations likely to be impacted by associated activities e.g., construction and routing of construction phase road vehicles.

19.4 Baseline Environment

19.4.1 Study Area

42. The study area has been defined with the application of relevant screening distances to the Order Limits and locations of associated activities; classified as the Zone of Influence (ZoI).
43. The ES includes flexibility in relation to the Project design, which can influence assessment outcomes. To allow for greater flexibility and confidence in the assessment outcomes, a Maximum Design Scenario (MDS) has been defined and assessed (detailed in Table 19.11). Use of a MDS for assessment purposes provides an understanding of all possible impacts.
44. Following this approach, the study area defined for each assessment is described in the following sections.

19.4.1.1 Construction Dust Assessment

45. The study area for the construction dust assessment has been defined on the following, which is set out in the IAQM guidance (IAQM, 2016):
    - Human receptors within 350m of the Order Limits and/or within 50m of routes used by construction vehicles, up to 500m from the onshore construction access points; and
    - Ecological receptors within 50m of the Order Limits and/or within 50m of routes used by construction vehicles, up to 500m from the onshore construction access points.
46. The full assessment methodology is detailed in Volume 3, Appendix 19.1: Construction Dust Assessment Methodology.

19.4.1.2 Road Traffic Emissions Assessment

47. The spatial extent of the study area for the road traffic assessment is initially defined using a series of established screening criteria to determine the extent of the 'affected road network' (i.e. public road links where road traffic flows are above the relevant screening thresholds).
48. The screening criteria utilised is dependent on the application (there are different criteria for human and ecological receptors). These are discussed further in Section 19.7.
49. Human and ecological receptors within 200m of the 'affected road network' as a result of the proposed onshore construction activities have been assessed, where necessary.
50. If an ecological and/or human receptor is located >200m from an affected road link, further consideration is not required. The 200m distance screening threshold is supported in various

guidance documents (IAQM, 2020 and National Highways et al., 2019) and is therefore considered appropriate.

19.4.1.3 NRMM Emissions Assessment

51. Human and ecological receptors within 50m of potential NRMM activity have been assessed. The maximum design parameters and extent of any proposed construction area have been used for the purposes of defining the locations of potential NRMM. This is considered precautionary, as it assumes that the Order Limits represent the location of all NRMM activity and therefore increases the opportunity for interactions with sensitive receptors. In reality, NRMM is likely to be operated within an area much smaller than this; contained within the Order Limits.
52. If an ecological and/or human receptor is located >50m from the Order Limits, further consideration for NRMM is not required.
53. The use of a 50m distance screening threshold in relation to NRMM emissions, where extensive onshore construction activities are proposed, has been considered appropriate and accepted by statutory consultees and the Planning Inspectorate for other NSIPs.
54. The full assessment methodology is detailed in Volume 3, Appendix 19.2: NRMM Emissions Assessment, and the study area displayed in Figure 19.5.

19.4.1.4 Vessel Emissions Assessment

55. Onshore human and ecological receptors within 1km of vessel movements generated by the Project have been assessed, consistent with the distance screening thresholds prescribed within Defra's LAQM.TG22.
56. The offshore array area is located 54km off the coast of Lincolnshire. Given the separation distance, vessel movements associated with the Project are therefore only likely to interact with onshore sensitive receptors where they are:
    - Used to facilitate the installation, maintenance and decommissioning of cabling infrastructure in close proximity to landfall; and
    - Exiting/entering a port.
57. The specific port location(s) to be utilised by vessels are yet to be determined, however it is likely to be Teesside during the construction phase, and Grimsby for the O&M phase. Regardless of the port location, all vessel movements will be compliant with the relevant port's operational constraints and management plans. Therefore, further consideration of vessels exiting and entering a port has not been given. This approach was set out in the EPP and at ETG meetings and no comments or concerns were received in relation to this.
58. The focus of this assessment thus relates to the potential extent of vessels used to facilitate the installation, maintenance, and decommissioning of cabling infrastructure at landfall and their interaction with onshore sensitive receptors. The study area therefore relates to onshore human and ecological receptors located within 1km of landfall. This location is referred to as the onshore vs. offshore interface i.e. the location where offshore vessels may interact with onshore receptors.
59. For the purposes of informing the study area it has been assumed that vessel movements occur

up to the point of the coastline – irrespective of logistical constraints (i.e. shallow water). This is conservative and increases the spatial extent of the onshore study area – as vessels movements are likely to occur some distance from the coast.

60. The full assessment methodology is detailed in Volume 3, Appendix 19.3: Offshore Activities Assessment, and the study area displayed in Figure 19.5.

19.4.2 Data Sources

61. The study area covers four Local Planning Authorities (LPA); BBC, ELDC, SHDC, and North Kesteven District Council (NKDC). Specific data for each LPA has been reviewed, where available.

62. In respect of local monitoring data, monitoring data collected prior to the COVID-19 pandemic (i.e., pre-2020) has been used to characterise the baseline environment, as pollutant concentrations monitored during 2020 and 2021 are expected to be atypical and have therefore not been considered. This approach is in line with Defra supplementary guidance (Defra and Greater London Authority, 2021). Where made publicly available (only SHDC and NKDC at present), 2022 monitoring data has been presented to demonstrate the potential continuation of monitoring trends post COVID-19. Although given the present uncertainty, 2019 monitoring data has been used for model verification purposes.

63. Data sources utilised include the following:

- BBC, 2020 Air Quality Annual Status Report (ASR) (BBC, 2020);
- ELDC, 2021 Air Quality ASR (ELDC, 2022)[2];
- SHDC, 2020 Air Quality ASR (SHDC, 2020);
- SHDC, 2023 Air Quality ASR (SHDC, 2023);
- NKDC, 2020 Air Quality ASR (NKDC, 2020);
- NKDC, 2020 Air Quality ASR (NKDC, 2023);
- Defra, AQMA Dataset (January 2024 update); and
- Defra, Mapped Background Concentration Estimates (2018 reference year).

64. The use of publicly available datasets to characterise the baseline environment has been discussed with statutory consultees during the Air Quality ETG process during which no concerns have been raised. In addition, no comments in relation to this were received during the Section 42 consultation.

19.4.3 Existing Environment

65. This section describes the present conditions which constitute the existing baseline environment for air quality within the onshore study area.

[2] ELDC did not release a 2020 ASR containing 2015-2019 monitoring data, and instead released a 2021 ASR containing 2016-2020 monitoring data. 2020 has not been considered given the implications of the COVID-19 pandemic.

66. The onshore ECC originates at the landfall at Wolla Bank and heads south to the OnSS at Surfleet Marsh. The 400kV cable corridor connects the OnSS to the Connection Area (an indicative search area for the National Grid substation (NGSS) in to which the Project would connect). A description of the proposed works is detailed in Volume 1, Chapter 3: Project Description.
67. The onshore study area for air quality is defined by the onshore Order Limits, this has been split into a number of segments which describe the significant local features within the Order Limits for means of assessment. Where possible and appropriate, these route segments have been referenced within this onshore air quality ES chapter and associated assessments.
68. However, the distribution and granularity of air quality baseline data means it does not easily categorise into the segments. This is for a few reasons:
    - In relation to local air quality monitoring locations, these are not necessarily located within the envelope of one segment and may be located at a distance from the Order Limits. Assignment to one segment may therefore not be appropriate. Furthermore, the monitored concentrations at each location may be applicable to the baseline environment of more than one segment;
    - In relation to AQMAs, these may be positioned away from the Order Limits, and this separation distance causes complications when aligning them to one segment. Furthermore, in relation to Project generated road traffic flows, an AQMA may be impacted by flows generated from more than one segment; and
    - In relation to the Defra mapped background concentrations, these are provided on a 1km grid square resolution. Where located on the segment borders, the 1km grid squares are likely to be intersected and would therefore apply to more than one segment.

19.4.3.1 LAQM Review and Assessment

69. ELDC, BBC, SHDC and NKDC, in fulfilment of statutory requirements, have conducted on-going exercises to review and assess air quality within their administrative areas, termed 'Review and Assessment'.
70. In ELDC, SHDC and NKDC, this process has not identified any exceedances of the AQALs at locations of relevant exposure and as such, none have declared any AQMAs.
71. Comparatively, BBC presently has one declared AQMA within their administrative area. The AQMA, known as Haven Bridge AQMA', was declared in 2001 for exceedances of the annual mean NO_2 AQAL at locations of relevant exposure. In February 2023, BBC revoked the AQMA known as Bargate Bridge AQMA; as monitored annual mean NO_2 concentrations recorded within this location have been consistently below the AQAL.
72. Due consideration has been given to potential interactions between Project impacts and AQMAs, where relevant.

19.4.3.2 Review of Air Quality Monitoring

Automatic Air Quality Monitoring

73. From review of national and local automatic monitoring networks, the closest automatic

monitor is located in Spalding (CM1), approximately 7.5km from the Order Limits.

74. Details and historic monitoring results recorded at CM1 are provided in Table 19.6 and Table 19.6Table 19.7, respectively.

Table 19.6 Details of Local Automatic Monitoring Locations

Site ID	LPA	Site Type	NGR-X	NGR-Y	In AQMA?	Distance to Order Limits (km)
CM1	SHDC	Urban Background	523168	322454	No	7.5

Table 19.7 Results from Local Automatic Monitoring Locations

Site ID	LPA	Pollutant and Averaging Period	Year					
			2015	2016	2017	2018	2019	2022
CM1	SHDC	Annual Mean NO_2 Concentration (µg/m^3)	10.5	12.7	10.8	9.4	9.3	8.9
		Number of Hourly NO_2 Means >200µg/m^3	0	0	0	0	0	0
		Annual Mean PM_{10} Concentration (µg/m^3)	15.4	13.5	11.8	13.1	13.7	11.5
		Number of Daily PM_{10} Means >50µg/m^3	1	2	0	1	0	0

75. As presented in Table 19.7, monitored concentrations at CM1 have been below the annual and short-term AQALs across the period presented 2015-2019 and 2022.

Non-Automatic Air Quality Monitoring

76. ELDC, BBC, SHDC, and NKDC all undertake non-automatic NO_2 diffusion tube monitoring within their administrative areas.

77. The details and results of the monitoring locations in proximity to the Order Limits and/or the affected road network are presented in Table 19.8 and Table 19.9, respectively, whilst their locations are displayed in Figure 19.1.1.

78. Some of the locations are >10km from the Order Limits, however, are adjacent to the affected road network and have therefore been considered within the construction road traffic emissions assessment for model verification purposes.

Table 19.8 Details of Local Non-Automatic Monitoring Locations

Site ID	LPA	Site Type	NGR-X	NGR-Y	In AQMA?	Distance to Order Limits (km)
1	BBC	Roadside	532575	343696	Haven Bridge	3.2
2		Roadside	532656	343716	Haven Bridge	3.3
3		Roadside	532470	343736	Haven Bridge	3.3
4		Roadside	532331	343848	Haven Bridge	3.4
5		Roadside	532859	343760	Haven Bridge	3.3
8		Roadside	533112	344476	No (former Bargate Bridge)	4.1

Site ID	LPA	Site Type	NGR-X	NGR-Y	In AQMA?	Distance to Order Limits (km)
9		Roadside	533251	344642	No (former Bargate Bridge)	3.9
12		Roadside	532168	343987	No	3.5
14		Roadside	533226	344624	No (former Bargate Bridge)	3.9
16		Roadside	532855	343719	No	3.3
17		Roadside	532877	343690	No	3.3
18		Roadside	532600	342737	No	2.3
19		Roadside	532630	342760	No	2.3
20		Roadside	532744	343719	Haven Bridge	3.3
21		Roadside	532024	344060	No	3.6
22		Roadside	532544	343702	Haven Bridge	3.2
H1	ELDC	Roadside	526075	369545	No	22.8
H2		Roadside	526028	369528	No	22.8
H3		Roadside	526264	369723	No	22.8
H4		Roadside	526007	369585	No	22.9
SK1/2/3		Roadside	556355	363295	No	3.5
SK4		Roadside	556380	363363	No	3.5
SH2	SHDC	Urban Background	524292	322587	No	6.7
SH3		Urban Background	525694	321999	No	6.3
SH4		Urban Background	536523	325078	No	7.3
SH5		Roadside	526585	328726	No	2.1
SH6		Roadside	535525	325589	No	6.2
SH11		Roadside	520932	336052	No	7.6
SH13		Kerbside	524595	323793	No	5.6
SH15		Roadside	524182	325804	No	4.8
SH16		Roadside	524203	331510	No	2.8
SH17		Roadside	524892	322571	No	6.3
SH18		Roadside	524191	321328	No	7.7
SH19(14)		Roadside	532684	324311	No	4.5
Grantham Road	NKDC	Roadside	506601	345300	No	24.7
Heckington		Kerbside	514514	343906	No	17.6
Holdingham 1		Urban Background	505704	347269	No	26.5
Holdingham 2		Urban Background	505985	347343	No	26.4
Sleaford		Roadside	506835	345684	No	24.7

Site ID	LPA	Site Type	NGR-X	NGR-Y	In AQMA?	Distance to Order Limits (km)
Sleaford-1		Urban Background	506753	345719	No	24.8
Westbanks		Roadside	506507	345744	No	25.0

Table 19.9 Results from Local Non-Automatic Monitoring Locations

Site ID	LPA	2019 Data Capture (%)	Annual Mean NO_2 Concentration (µg/m^3)					
			2015	2016	2017	2018	2019	2022
1	BBC	92	49.7	45.8	49.4	42.4	49.2	-
2	BBC	8	50.1	37.5	44.5	44.5	-	-
3	BBC	100	46.0	46.2	53.2	48.3	46.5	-
4	BBC	100	36.4	38.6	38.0	39.4	39.8	-
5	BBC	92	34.9	34.6	36.8	34.7	34.8	-
8	BBC	100	31.1	31.1	31.3	32.5	31.3	-
9	BBC	100	44.2	41.5	43.6	39.4	37.0	-
12	BBC	100	28.6	26.8	27.6	31.8	28.9	-
14	BBC	100	36.6	36.7	37.1	37.8	35.8	-
16	BBC	100	-	-	-	-	30.1	-
17	BBC	83	-	-	-	-	30.5	-
18	BBC	100	-	-	-	-	33.8	-
19	BBC	100	-	-	-	-	27.5	-
20	BBC	100	-	-	-	46.3	41.6	-
21	BBC	100	-	-	-	30.0	29.0	-
22	BBC	67	-	-	-	-	35.9	-
H1	ELDC	100	-	36.7	37.0	32.3	34.3	-
H2		100	-	29.5	29.0	26.8	25.9	-
H3		92	-	18.6	12.6	11.7	12.5	-
H4		100	-	29.8	26.1	26.4	25.0	-
SK1/2/3		100	-	29.7	28.2	29.4	28.7	-
SK4		58	-	25.5	26.4	24.2	22.7	-
SH2	SHDC	100	-	-	-	-	32.1	32.2
SH3		100	-	-	-	-	11.0	10.7
SH4		100	10.7	14.0	12.1	10.6	10.1	9.6
SH5		100	14.6	16.2	16.2	13.4	12.8	12.1
SH6		92	19.7	25.9	19.9	19.2	27.9	27.6
SH11		100	-	-	-	-	15.5	14.4
SH13		100	29.8	34.8	34.9	27.1	25.7	25.9
SH15		100	-	-	-	-	22.3	19.6
SH16		100	12.5	13.9	14.1	16.1	17.0	13.6
SH17		100	24.3	27.5	24.2	22.8	20.3	22.2
SH18		100	22.5	26.5	23.4	20.2	19.8	18.7
SH19(14)		100	-	-	-	-	16.3	14.5

Site ID	LPA	2019 Data Capture (%)	Annual Mean NO_2 Concentration (µg/m^3)					
			2015	2016	2017	2018	2019	2022
Grantham Road	NKDC	75	-	-	-	17.7	17.5	11.0
Heckington		75	-	-	-	-	17.3	15.6
Holdingham 1		100	-	-	-	22.0	19.0	13.9
Holdingham 2		100	-	-	-	19.0	18.0	14.0
Sleaford		75	25.3	25.6	24.0	27.3	24.2	23.6
Sleaford-1		100	13.6	14.0	13.4	14.5	13.3	-
Westbanks		92	-	-	-	18.6	17.0	13.2

79. As displayed in Table 19.9, annual mean NO_2 concentrations above the AQAL (40µg/m^3) have been recorded at several monitors for the period 2015-2019. These monitors are all located within BBC, either in the current Haven Bridge AQMA or the revoked Bargate Bridge AQMA. Monitored annual mean NO_2 concentrations within the Bargate Bridge AQMA (now revoked) have been below the AQAL since 2018 (i.e., monitor ID 8, 9 and 14).

80. Monitored annual mean NO_2 concentrations at the remaining monitors within BBC, and also within ELDC, SHDC and NKDC have remained below the AQAL throughout the period 2015-2019. Where 2022 annual mean NO_2 concentrations are available in NKDC and SHDC, these are below the annual mean AQAL.

81. In general, monitored concentrations across the study area and in proximity to the affected road network are exhibiting a reduction when 2015 concentrations are compared to 2019. This is also supported by 2022 monitoring, whereby the 2022 concentrations are lower than 2019 concentrations at the majority of locations where data is available. This follows the assumptions embedded in LAQM tools and datasets.

82. The closest monitor to the Order Limits is SH5, located approximately 2.1km away. Monitor SH5 is situated near the village of Surfleet, in proximity to the roadside of A16. Monitored annual mean NO_2 concentrations at monitor were well below the AQAL (i.e., <75%) across the period 2015-2019 and 2022.

83. In accordance with the empirical relationship presented in LAQM.TG22, exceedances of the 1-hour mean AQAL are considered unlikely where annual mean concentrations are <60µg/m^3. On this basis, exceedances of the 1-hour mean AQAL are considered unlikely across the period (2015-2019 and 2022) at monitors presented.

Defra Mapped Background Concentrations

84. Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km grid square resolution.

85. Annual mean background concentrations of NO_x, NO_2, PM_{10} and $PM_{2.5}$ have been obtained from the Defra published background maps (2018 reference year), based on the 1km grid squares which cover the Order Limits (Defra, 2020).

86. The minimum and maximum Defra mapped background concentrations for the base year (2019), anticipated commencement of the construction phase (2027), and anticipated

operational year (2030) are presented in Table 19.10.

Table 19.10 Defra Mapped Background Concentrations

Year	Annual Mean Background Concentration (µg/m^3)			
	NO_x	NO_2	PM_{10}	$PM_{2.5}$
2019	12.1	9.2	16.8	9.4
2027	9.6	7.4	15.8	8.5
2030	9.3	7.2	15.8	8.5
AQAL	**-**	***40***	***40***	***20***

87. All of the mapped background concentrations across the grid squares covered by the Order Limits are well below the respective annual mean AQALs.

19.4.3.3 Sensitive Receptors

88. The study area has been defined in line with the criteria for each assessment, described at the beginning of this section. Where sensitive human and ecological receptors are located within the ZoI and are relevant to the assessment, these have been specifically discussed for each of the impact assessments (Section 19.8).

19.4.4 Future Baseline

89. Baseline air quality conditions are expected to improve in the future, including in the interim prior to the commencement of construction, through to operation, decommissioning and beyond.

90. Generally, air quality is expected to improve in future years, with an increased uptake of electric vehicles and more stringent emission standards, as well as the enforcement of local and national policy and initiatives. This includes the 2019 Clean Air Strategy (Defra, 2019) and Environmental Improvement Plan 2023 (Defra, 2023b).

91. In parallel to the above, both Central and Local Governments, guided by separate legislative mandates, implement targeted measures in locations where evidence indicates pollutant concentrations persistently exceed the relevant AQALs. These measures include:

    - In response to persistent localised exceedances, the Government published its 2017 plan aimed at reducing roadside NO_2 concentrations to achieve compliance in the shortest time possible (Defra and Department for Transport (DfT), 2017). This has resulted in the introduction of Clean Air Zones across England; and
    - Implementation of local authority AQAPs within AQMAs. These plans outline the measures that local authorities intend to introduce to deliver improvements in local air quality and achieve compliance. Targeted actions outlined within BBC's 2020 AQAP (BBC, 2019) has resulted in the revocation of the Bargate Bridge AQMA, based on consistent reductions in annual mean NO_2 concentrations (Section 19.4.3).

92. Improvements are also realised via the introduction of tighter legislative pollutant thresholds (Section 19.2.1). For instance, the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 resulted in the introduction of a lower $PM_{2.5}$ Limit Value of 20µg/m^3 (to be met by 2020) (which was previously 25µg/m^3). Further to this, the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 via the Environment Act 2021, introduced a

maximum $PM_{2.5}$ concentration target of 10µg/m^3 to be met across England by 2040.

93. As such, pollutant concentrations reported locally are expected to reduce in future years. This is reflected in annual mean background concentration projections provided by Defra (based on semi-empirical evidence), as presented in Table 19.10. These data demonstrate the anticipated improvement in background pollutant concentrations for the local area, particularly for NO_2 – given current local and national emphasis.

19.5 Basis of Assessment

19.5.1 Scope of the Assessment

94. The scope of the assessment has been informed by both national and local planning policy and guidance, established best practice and experience, as well as via the consultation process with relevant consultees.

95. As detailed in Table 19.5, following receipt of the Scoping Opinion from The Planning Inspectorate (The Planning Inspectorate, 2022), there were impacts agreed to be scoped out of the assessment, however others which required further consideration. The impacts scoped in and out of the assessment are detailed below, with further information or justification, where required.

19.5.1.1 Impacts Scoped-In for Assessment

96. The following impacts have been scoped into this assessment:

- Construction:
  - Impact 1: Dust/PM_{10} emissions generated from temporary onshore construction works;
  - Impact 2: Road traffic emissions generated from temporary construction vehicle movements;
  - Impact 3: Emissions generated from temporary construction NRMM. This impact was scoped into the assessment following comments from The Planning Inspectorate within the Scoping Opinion (The Planning Inspectorate, 2022); and
  - Impact 4: Emissions generated from temporary offshore construction vessel movements. This impact was scoped into the assessment following comments from The Planning Inspectorate within the Scoping Opinion (The Planning Inspectorate, 2022). Consideration of Impact 4 has been undertaken as part of a wider Offshore Activities Assessment.
- Operation and maintenance:
  - Impact 1: Operational phase traffic movements. The Planning Inspectorate within the Scoping Opinion (The Planning Inspectorate, 2022) agreed that significant effects were unlikely to occur from O&M phase vehicle movements. However, despite this requested comparison of the O&M phase road traffic flows against the EPUK & IAQM screening criteria. This has therefore been scoped into the assessment, and the likely flows presented.

- Decommissioning:
    - Impact 1: Decommissioning phase traffic movements and other works. The Planning Inspectorate within the Scoping Opinion (The Planning Inspectorate, 2022) stated that impacts associated with road traffic flows and other works during the decommissioning phase were not fully described or understood, and therefore the potential for a significant effect could not be scoped out. Further details are provided below.

97. Details surrounding the decommissioning phase are yet to be fully clarified. In addition, it is also recognised that policy, legislation, and local sensitivities evolve, which will limit the relevance of undertaking an assessment at this stage.

98. Furthermore, decommissioning activities are expected to occur for up to three-years (however this will be driven primarily by offshore works), and are not anticipated to exceed the construction phase worst case criteria assessed, given the following:

- Landfall and cable infrastructure is expected to be left in situ where appropriate, to abate potential future impacts and minimise the extent of decommissioning activities;
- Emission restrictions are expected to tighten in future years and in the interim before decommissioning activities occur (i.e., >25 years from installation). This forecast is based on the introduction and availability of cleaner technologies and fuels, alongside legislation. Therefore, emission contributions from potential future sources (e.g., vehicles, vessels and NRMM) generated during the decommissioning phase are expected to be lower in comparison; and
- Air quality is expected to improve in future years, and in the interim before decommissioning activities occur; based on the introduction of policy and legislation, and availability of cleaner technologies. This is discussed in Section 19.4.4.

99. These elements (alone and/or in combination) would result in a reduction in the level of significance in comparison to the assessment of construction effects.

100. Nonetheless, the decommissioning methodology would be finalised nearer to the end of the lifetime of the Project, to be in line with current guidance, policy and legislation. Any such methodology would be agreed with the relevant authorities and statutory consultees. Furthermore, the DCO will include requirements for the submission of a Decommissioning Plan – considered embedded mitigation (Table 19.12).

101. To satisfy The Planning Inspectorate's comments, qualitative consideration has been given to the extent of potential decommissioning impacts through consideration of the construction phase worst case assessment outcomes – to determine whether further assessment is required.

19.5.1.2 Impacts Scoped out of Assessment

102. Impacts were scoped out of the assessment in line with feedback provided through the Scoping Opinion (The Planning Inspectorate, 2022), Section 42 responses and further consultation through the EPP. The assessment scope was also based on the receiving environment and expected parameters of the Project (Volume 1, Chapter 3: Project Description), the expected scale of impact and the potential for a pathway for effect on the

environment. The following impacts have been scoped out of the assessment:

- Operation and maintenance:
  - Impacts associated with emissions generated from offshore vessel movements during the O&M phase have been scoped out of the assessment. This was agreed following the receipt of comments from The Planning Inspectorate within the Scoping Opinion (The Planning Inspectorate, 2022).
- Transboundary effects: based on the Scoping Opinion (The Planning Inspectorate, 2022), it was agreed with The Planning Inspectorate that transboundary effects can be scoped out of the assessment.

19.5.2 Realistic Worst-Case Scenario

103. The following section identifies the MDS in environmental terms, defined by the Project design envelope. This has undergone refinements since the PEIR stage, which has been reflected in the assessment inputs/parameters.

104. The onshore elements of the Project include some flexibility in terms of the onshore ECC and 400kV cable corridor. The temporary construction corridor width of the onshore ECC is typically 80m with a typical permanent corridor width of 60m and the temporary construction corridor width of the 400kV cable corridor is typically 60m with a permanent corridor width of typically 40m.

105. As described in Volume 1, Chapter 3: Project Description, the Applicant requires flexibility in the location and layout of the wind turbine generators (WTGs) within the Array area, which impacts the numbers of WTGs required. This influences the number of offshore construction vessel movements associated with the Project and therefore has a bearing on the construction phase Impact 4.

106. These potential design scenarios/parameters can individually impact the outcomes of the air quality assessment. As such, to allow for greater flexibility and undertake precautionary assessment, a MDS has been defined and considered for each assessment individually.

107. The MDS has been selected as that which has the potential to result in the greatest effect on air quality. The scenario has been selected from the project design envelope detailed in Volume 1, Chapter 3: Project Description.

108. Table 19.11 identifies the MDS in environmental terms.

Table 19.11 Maximum Design Scenario for Onshore Air Quality for the Project Alone

Potential effect	Maximum design scenario assessed	Justification
Construction		
Impact 1: Dust/PM_{10} emissions generated from temporary onshore construction works	Maximum design parameters/extents of any proposed construction area have been used for the purposes of defining potential dust sources. This has included the use of the Order Limits to determine the extent of all potential dust sources. For the purposes of trackout[3], all potential construction access points and subsequent access routes have been used. As per the Outline Air Quality Management Plan (Document 8.1.2), dust generating activities will be positioned to maximise the separation distance(s) to sensitive receptors, as far as practically possible. Onshore construction areas have been assessed for the entire onshore Order Limits, rather than in the discrete route segments. This aggregated approach will increase the opportunity for greater derived sensitivities and dust emission magnitudes, and therefore impacts.	This captures all potential scenarios and associated impacts in the assessment.
Impact 2: Road traffic emissions generated from temporary construction vehicle movements (human and	Traffic data used for the purposes of the modelling exercise has been informed by analysis undertaken and presented as part of Volume 1, Chapter 27: Traffic and Transport. To ensure potential air quality impacts that may arise throughout the construction phase are understood, 2027 has been adopted for the purposes of dispersion	This captures all potential scenarios and associated impacts in the assessment.

[3] The IAQM guidance (IAQM, 2016) defines trackout as "The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when HDVs leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site."

Potential effect	Maximum design scenario assessed	Justification
ecological impact assessment)	modelling (i.e., earliest date of potential construction). Use of 2027 is conservative in recognition of the forecast reductions in vehicle emission factors and background pollutant concentrations following the introduction of legislative and policy initiatives, alongside low emission technologies/fuels (Section 19.4.4). As an input to the dispersion modelling exercise, annual average daily traffic (AADT) flows are required. To provide greater confidence in the road traffic emissions assessment outcomes, construction road traffic flows have been calculated with use of the maximum consecutive 12-month (representing annual) flows (heavy-duty vehicles (HDVs) and employees (light-duty vehicles (LDVs)) separately) across the construction programme. This captures the highest average period of construction for each section of the network in the assessment. This approach is considered appropriate in comparison to averaging out road traffic values across the full onshore construction period to derive AADT flows (i.e., annualised average daily traffic flows), which would dilute the predicted datasets. The traffic flows used in the assessment include vehicle movements associated with relevant committed developments and live projects/plans in the assessment area - insofar as possible (based upon information currently available). This is based on analysis undertaken in Volume 1, Chapter 27: Traffic and Transport. Consideration of these schemes assumes they become fully operable at the point of assessment. Furthermore, where dispersion modelling has been conducted, regulated non-road emissions (e.g. from combustion processes) associated with developments listed in Table 19.20 have also been considered – to replicate future air quality conditions and impacts. This is limited to emissions associated with Boston Alternative Energy Facility (BAEF). Further detail is provided in Appendix 19.4: Road Traffic Dispersion Modelling.	

Potential effect	Maximum design scenario assessed	Justification
	The road traffic emissions assessment is therefore inherently cumulative in nature. For further information regarding the road traffic flows generated by the Project see Volume 1, Chapter 27: Traffic and Transport.	
Impact 3: Emissions generated from temporary construction NRMM	Maximum design parameters/extents of any proposed construction area have been used for the purposes of defining potential locations of NRMM. This is considered conservative, as it assumes that all NRMM will be operating at the Order Limits and therefore increases the opportunity for potential interactions with sensitive receptors. This is unlikely to be the case as NRMM locations will vary across the active construction area. Furthermore, as per the Outline Air Quality Management Plan (Document 8.1.2), site machinery will be positioned to maximise the separation distance(s) to sensitive receptors, as far as practically possible. Where there is uncertainty and/or optionality regarding the extent of specific construction activities within 50m of a receptor, all possible construction activities have been considered for completeness. This is considered worst-case, as it is possible that the full extent of construction activities and NRMM identified may not occur within 50m of the receptor. In addition to the above, the assessment has utilised the number of NRMM potentially active during each activity and its percentage use. This is likely to be conservative as the actual number and duration utilised may be less at any given time and receptor.	This captures all potential scenarios and associated impacts in the assessment.
Impact 4: Emissions generated from temporary offshore construction vessel movements	Vessel movements used within this assessment derive from values provided within Volume 1, Chapter 3: Project Description. As described in the chapter, the Project requires flexibility in the location and layout of the WTGs, which impacts the potential number of WTGs required – a maximum	This approach provides a precautionary assessment and increases the confidence in the overall assessment outcomes.

Potential effect	Maximum design scenario assessed	Justification
	of 100 WTGs, to a minimum of 50 WTGs. Therefore, the number of WTGs associated with a worst-case scenario in terms of vessel movements has been utilised in the assessment. The number of predicted construction vessels movements provided in Volume 1, Chapter 3: Project Description relates to the extent of vessels generated throughout the whole construction period. The construction period is expected to be greater than 1 year. To increase the confidence in the screening exercise and minimise the use of assumptions, the total number of construction vessel movements estimated to occur throughout the whole construction phase has been used. This is considered to be conservative, as the screening thresholds relate to the number of vessel movements permitted to occur in an annual period. Actual annual movements are anticipated to be lower than those values used for screening. Construction vessel movements have been categorised based upon their likelihood to occur within 250m or 1km of an onshore sensitive receptor located in proximity of construction works to be consistent with the LAQM.TG22 screening thresholds. Where there is uncertainty regarding whether certain vessel movements will occur within 250m or 1km of an onshore sensitive receptor, all vessel movements have been considered for completeness. For the purposes of informing the study area it has been assumed that vessel movements occur up to the point of the coastline – irrespective of logistical constraints (i.e. shallow water). This is conservative and increases the spatial extent of the onshore study area – as vessels movements are likely to occur some distance from the coast.	

Potential effect	Maximum design scenario assessed	Justification
	The LAQM.TG22 screening thresholds applied within the assessment relate explicitly to large ship movements which comprise cross-channel ferries, roll-on/roll-off ships, bulk cargo, container ships and cruise liners. Vessel movements generated by the Project are unlikely to represent large ships, given the nature and location works (within 1km of the coast). However, for the purposes of facilitating an assessment, it has been assumed that all vessels will comprise large ships.	
Operation and Maintenance		
Impact 1: Operational phase traffic movements	For the purposes of facilitating a conservative screening exercise, peak vehicle movements generated during the O&M phase have been assessed.	This approach increases the confidence in the overall assessment outcomes.
Decommissioning		
Impact 1: Decommissioning phase traffic movements and other works	Details surrounding the decommissioning phase are not fully known, however, decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed, given forecast improvements to air quality and the potential for the cables to remain in situ. It is therefore considered that impacts associated with decommissioning activities will be similar or lesser in comparison to those established for the construction phase.	

19.6 Embedded Mitigation

109. Mitigation measures that were identified and adopted as part of the evolution of the Project design (embedded into the Project design) and that are relevant to Onshore Air Quality are listed in Table 19.12. General mitigation measures, which would apply to all parts of the Project, are set out first. Thereafter mitigation measures that would apply specifically to Onshore Air Quality issues associated with the landfall, onshore cable corridor and OnSS, are described separately where applicable.

Table 19.12 Embedded Mitigation Relating to Onshore Air Quality

Project phase	Mitigation measures embedded into the project design
Construction	
CoCP	Development of, and adherence to a CoCP. The CoCP will follow best practice and apply to all onshore construction activities. An Air Quality Management Plan (AQMP) will be in included in the CoCP and will be produced in line with the Outline AQMP submitted as part of the Outline CoCP submitted as part of the application (document reference 8.1). It includes measures relating to dust control and NRMM emissions. The construction dust assessment methodology identifies mitigation measures recommended for inclusion. In addition, the Outline Soil Management Plan forms part of the CoCP and sets out the principles and procedures for general good practice mitigation for soil management.
Decommissioning	
Decommissioning Plan	Development of, and adherence to, a Decommissioning Plan.

19.7 Assessment Methodology

110. Whilst Volume 1, Chapter 5: EIA Methodology provides an indicative EIA assessment matrix, it also identifies that assessment methodologies will reflect the prevailing technical area guidance and specific requirements of receptor groups. As such the following sections provide a description of the assessment criteria and assessment methodologies used to assess air quality, which are derived from best practice guidance.

19.7.1 Construction Phase

19.7.1.1 Impact 1: Dust/PM_{10} emissions generated from temporary onshore construction works

111. The assessment of dust generated by construction activities on nearby sensitive human and ecological receptors has been undertaken in accordance with the IAQM construction guidance (IAQM, 2016).

112. The likely impact magnitude of unmitigated dust emissions associated with demolition, earthworks, construction, and trackout is used in conjunction with the receptor sensitivity to determine the risk of impact for each activity. These sensitivities are:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM_{10}, and

- Harm to ecological receptors.

113. The risk of impact is then used to determine proportionate mitigation requirements in line with the IAQM guidance (IAQM, 2016), which form embedded mitigation for the Project. The likelihood for a significant effect to arise is considered with this embedded mitigation in place.

114. Full details of the assessment methodology are provided in Volume 3, Appendix 19.1: Construction Dust Assessment Methodology.

19.7.1.2 Impact 2: Road traffic emissions generated from temporary construction vehicle movements

115. For the assessment of construction phase road traffic emissions on ecological and human receptors, an initial screening exercise has been conducted to determine whether detailed modelling is required through definition of the affected road network. The screening criteria utilised is dependent on the application for human and ecological receptors. This is discussed further in the following sections.

116. Where road traffic movements cannot be screened out in accordance with the applied screening criteria, further detailed assessment has been undertaken.

117. Where required, road traffic impacts generated by the Project on human and ecological receptors have been assessed with use of the Cambridge Environmental Research Consultants (CERC) ADMS-Roads v5 dispersion model.

118. The dispersion modelling assessment has considered the following scenarios:

- 2019 Base Case (2019 BC) – Base flows for the year (2019);
- 2027 Do Minimum (2027 DM) – Without construction phase road traffic flows for the planned construction start year (2027), inclusive of any other relevant development (live and committed) flows;
- 2027 Do Something (2027 DS) – 2027 DM, plus road traffic flows associated with construction activities for the planned construction start year (2027); and
- 2027 Do Minimum minus Committed (2027 DM-C) – Comprising future baseline flows without the addition of committed developments, to disaggregate in-combination impacts on designated ecological sites.

119. For the above future year scenarios (2027 – representing the earliest date of potential construction), concurrent emission factors and (projected) background pollutant concentrations have been used. Background deposition rates derive from APIS; these are based on measured-interpolated data for a three-year rolling mean average (presently 2019 – 2021). Use of this dataset assumes no improvement in background deposition for 2027 DM/DS.

120. To ensure potential air quality impacts that may arise throughout the construction phase are understood, 2027 has been adopted for the purposes of dispersion modelling (i.e., earliest date of potential construction). Use of 2027 is conservative, in recognition of the forecast reductions in vehicle emission factors and background pollutant concentrations (Section 19.4.4).

121. Traffic data used for the purposes of the road traffic emissions assessment has been informed by analysis undertaken and presented as part of Volume 1, Chapter 27: Traffic and

Transport.

122. To provide greater confidence in the road traffic emissions assessment outcomes, the maximum consecutive 12-month (representing annual) traffic flows have been used. Within the context of dispersion modelling, this approach assumes that the maximum consecutive 12-month vehicle flows generated throughout the whole construction phase occur under worst case air quality conditions (vehicle emission factors and background pollutant concentrations) projected for the full construction period. This is considered conservative.

123. The traffic flows used in the assessment include vehicle movements associated with relevant committed developments and live projects/plans in the assessment area - insofar as possible (based upon information currently available). This is based on analysis undertaken in Volume 1, Chapter 27: Traffic and Transport. Consideration of these schemes assumes they become fully operable at the point of assessment.

124. At the time of the assessment and from review of the SHDC planning portal[4], no Transport Statement or details of traffic movements associated with the Naylor Farms development were available and this was therefore not included in the assessment.

125. At this stage, road traffic volumes associated with the NGSS have not been disclosed and have therefore not been included within the dispersion modelling assessment. However, reasonable assumptions have been made to allow for consideration of the likely traffic volumes associated with the NGSS and the potential for cumulative effects, this is provided in Section 19.9.5.

126. In addition to traffic inputs, non-road inputs are incorporated into the detailed dispersion modelling assessment with application of the background datasets, which include non-road emission contributions.

127. It is recognised that committed development and projects/plans may become operable in the interim since the background datasets were published, and subsequent emission contributions would therefore not be included in the datasets.

128. To account for this, where dispersion modelling has been conducted, regulated non-road emissions (e.g. from combustion processes) associated with developments listed in Table 19.20 have also been considered to replicate future air quality conditions and impacts. This is limited to emissions associated with BAEF. Further detail is provided in Appendix 19.4: Road Traffic Dispersion Modelling.

129. Outputs presented within the BAEF Air Quality ES Chapter and technical appendices have been used to facilitate the assessment. Emissions from BAEF have only been considered with respect to human receptors. Based on a review of application documentation, BAEF emissions will not interact with any of the ecological designations considered within the road traffic modelling assessment. No further cumulative assessment is necessary.

130. Further details regarding the MDS considered are discussed in Section 19.5.2.

[4] SHDC planning portal reviewed on 31/01/2024.

131. The dispersion modelling exercise has been undertaken in accordance with Defra's LAQM.TG22.

132. With respect to human receptors, consideration has been given to the relevant AQALs. Concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been predicted at locations of relevant exposure at existing sensitive receptors – adjacent to the affected road network.

133. With respect to ecological receptors, consideration has been given to the relevant Critical Levels and Critical Loads. Concentrations of NO_x have been predicted at ecological designations within 200m of the affected road network, with use of gridded and boundary receptors (to ensure maximum impacts are understood). Empirical methods prescribed within the IAQM's ecological guidance (IAQM, 2020) have been used to facilitate the assessment of Critical Loads.

134. Ecological receptor information has been obtained from APIS. For the assessment of Critical Loads, grassland and woodland habitats have both been assessed where present at the same designation (as they are subject to different deposition velocities).

135. The assessment criteria outlined within the following sections has been used to determine the overall significance of the Project, with respect to construction road traffic modelled impacts on human and ecological receptors.

136. Full details of the assessment methodology are provided within Volume 3, Appendix 19.4: Road Traffic Dispersion Modelling.

Human Receptors

137. The assessment procedure outlined within the EPUK & IAQM guidance document (EPUK & IAQM, 2017) has been used in relation to the assessment of road traffic emissions generated by the Project on human receptors.

138. This initially comprises a screening exercise to determine whether detailed modelling is required.

Step 1: Numerical Screening of Road Traffic Flows

139. The screening criteria provided in the EPUK & IAQM guidance document has been used to determine whether further assessment of traffic generated by the construction or O&M phases of the Project is required on sensitive human receptor locations.

140. Specific to locations outside of an AQMA:

- A change of Light-Duty Vehicle (LDV) flows of more than 500 AADT; and/or
- A change of Heavy-Duty Vehicle (HDV) flows of more than 100 AADT.

141. Specific to locations near to or within an AQMA:

- A change of LDV flows of more than 100 AADT; and/or
- A change of HDV flows of more than 25 AADT.

142. Screening is conducted on a Project alone basis i.e. cumulative considered is not necessary.

143. If road traffic flows are found not to exceed any of the screening criteria presented, then effects are considered insignificant and can be screened out of further consideration.

144. Where the screening criteria are exceeded (and relevant human receptors are located within 200m of the affected road network – discussed in Section 19.4.1), detailed dispersion modelling is required (Step 2).

Step 2: Dispersion Modelling

145. Significance criteria as provided within EPUK & IAQM guidance has been used for the purposes of informing effects arising from road traffic emissions on human receptors where dispersion modelling has been undertaken.

146. Whilst describing the impact at an existing human receptor, the resultant total concentration as well as the magnitude of change in relation to respective AQALs are both considered, using the approach detailed in Table 19.13.

Table 19.13 EPUK & IAQM Impact Descriptors

Concentration with development	Percentage change in air quality relative to AQAL (%)			
	1% *	2-5%	6-10%	>10%
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial
Note: * = changes less than 0.5% are considered to be 'Negligible'.				

147. Following derivation of impacts at all existing receptor locations assessed, the overall significance of the developmental 'effect' is determined based upon consideration, as necessary, of the following factors:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts;
- The worst-case assumptions adopted when undertaking the prediction of impacts; and
- The extent to which the proposed development has adopted best practice to eliminate and minimise emissions.

Ecological Receptors

148. The assessment procedure outlined within the IAQM ecological guidance document (IAQM, 2020) has been used in relation to the assessment of sensitive ecological receptors and road traffic.

149. This comprises a staged screening procedure to determine the potential for a likely significant effect to occur.

Step 1: Screening

150. The first stage is to consider whether any ecological designations with sensitive qualifying features are located within 200m of a road link that is projected to experience vehicle

movements >1,000 AADT and/or >200 HDVs resulting from the Project.

151. For the purposes of assessing impacts, screening of Project trips has been undertaken alone and in-combination with trips associated with relevant committed developments and other projects and plans (see Volume 1, Chapter 27: Traffic and Transport for further information). In-combination screening for internationally designated ecological sites is supported by legislation (e.g. Habitats Regulations) and recent case law outcomes (e.g. the Wealden Judgement[5]). Furthermore, Natural England recommends it for SSSIs. In this assessment, locally designated sites have also been considered in the context of in-combination screening, on the basis of feedback received from The Planning Inspectorate (The Planning Inspectorate, 2022).

152. If the above screening criteria are not exceeded, then impacts on ecological designations are likely to be imperceptible, whereby resultant effects are considered to be not significant.

153. If the screening criteria are exceeded, then detailed assessment through dispersion modelling is required to quantify the impact on Critical Levels and/or Critical Loads (Step 2).

Step 2: Dispersion Modelling

154. Where impacts can otherwise not be screened out, dispersion modelling has been used to quantify the impact of road traffic emissions on Critical Levels and/or Critical Loads.

155. Effects associated with changes can be classed as insignificant where they are <1% of the Critical Levels and/or Critical Loads.

156. Use of the 1% threshold for the assessment of road traffic impacts on international sites is supported by Natural England (Natural England, 2018). This guidance does not specifically cover other ecological designations. However, the 1% threshold has been applied to all other designations.

157. If modelled changes are below these thresholds, then impacts on ecological designations are likely to be imperceptible, whereby resultant effects are considered to be not significant in terms of the EIA regulations.

158. Where impacts cannot be screened out on this basis, a detailed assessment is consequently required. This includes the calculation of the total predicted pollutant dataset at the affected site(s) to determine whether the Critical Level/Load will be exceeded (above which significant harmful effects are known to occur). Assessment information is referred to the Project Ecologist to determine significance.

159. It should be reinforced that exceedance of this 1% threshold does not, of itself, imply damage to a habitat, rather implies further assessment is required as the impacts cannot be described as imperceptible.

[5] Wealden District Council v Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority [2017] EWHC 351 (Admin).

19.7.1.3 Impact 3: Emissions generated from temporary construction NRMM

160. The IAQM construction guidance (IAQM, 2016) states that experience of assessing exhaust emissions from NRMM suggests that they are unlikely to result in a significant effect in terms of the EIA regulations.

161. Furthermore, Defra's LAQM.TG22, states that experience of assessing exhaust emissions from NRMM suggests that, with suitable controls and site management, they are unlikely to make a significant impact on local air quality. In recognition of this, a series of construction phase control measures are included within the Outline Air Quality Management Plan (Document 8.1.2), which forms part of the Outline CoCP, to minimise NRMM emissions and potential impacts. A CoCP is a requirement of the DCO.

162. Further to the above, a qualitative assessment of NRMM emissions on sensitive human and ecological receptors has been undertaken in accordance with guidance prescribed within Defra's LAQM.TG22. A qualitative approach to NRMM assessment is supported by both the IAQM and Defra (IAQM, 2016 and Defra, 2022) and should provide sufficient screening of impacts.

163. The qualitative assessment has considered the likelihood for a significant effect to arise on sensitive human and ecological receptors, based on the following items:

- Duration of construction works and associated phasing (where available);
- The number and type of NRMM to be used (including the emissions standards of the NRMM);
- Operating hours of NRMM;
- Proximity of sensitive receptors to NRMM working areas; and
- Existing air quality conditions in the area (e.g., Defra background pollutant concentrations).

164. Full details of the assessment methodology are provided in Volume 3, Appendix 19.2: NRMM Emissions Assessment.

19.7.1.4 Impact 4: Emissions generated from temporary offshore construction vessel movements

165. Consideration of Impact 4 has been undertaken as part of a wider Offshore Activities Assessment.

166. The assessment of construction phase offshore vessel emissions has been informed by Defra's LAQM.TG22 (Defra, 2022).

167. Vessel movements generated during the construction phase have been compared against the following screening thresholds to determine whether further assessment is required:

- More than 5,000 large ship movements per year, with relevant exposure within 250m of berths and main areas of manoeuvring; and/or
- More than 15,000 large ship movements per year, with relevant exposure within 1km of these areas.

168. It should be acknowledged that the LAQM.TG22 screening thresholds relate explicitly to large ship movements which comprise cross-channel ferries, roll-on/roll-off ships, bulk cargo,

container ships and cruise liners. Vessel movements generated by the Project are unlikely to represent large ships, given the nature and location works (within 1km of the coast). For the purposes of facilitating an assessment, it has been assumed that all vessels will comprise large ships. Use of this assumption provides a precautionary assessment.

169. If annual vessel movements generated by the construction phase of the Project are below the LAQM.TG22 prescribed screening thresholds, then impacts are considered to be negligible, with the resultant effect not significant in terms of the EIA regulations and can be screened out of further consideration.

170. Consideration has also been given to the extent of helicopter movements generated by the Project, during all stages of development, and the likelihood for a significant effect to arise.

171. Full details of the assessment methodology are provided in Volume 3, Appendix 19.3: Offshore Activities Assessment.

19.7.2 Operational Phase

19.7.2.1 Impact 1: Operational phase traffic movements

172. In response to The Planning Inspectorate's specific request within the Scoping Opinion (The Planning Inspectorate, 2022), road traffic flows generated by operational phase activities have been compared against EPUK & IAQM screening thresholds to determine whether further assessment is required.

173. These screening thresholds are outlined within Paragraphs 140 and 141.

19.7.3 Decommissioning Phase

19.7.3.1 Impact 1: Decommissioning phase traffic movements and other works

174. To satisfy The Planning Inspectorate's comments, qualitative consideration has been given to the extent of potential decommissioning impacts with reference to the construction phase assessment outcomes to determine whether further assessment is required.

175. Decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed given the reasons outlined in Section 19.5.1.1. The construction phase outcomes therefore provide an appropriate reference for understanding potential decommissioning impacts in the absence of a finalised Decommissioning Plan.

19.7.4 Assumptions and Limitations

19.7.4.1 General

176. Data used to compile this report consists of secondary information derived from a variety of sources. The assumption is made that this data, as well as that derived from other secondary sources, is reasonably accurate.

177. Unless otherwise specified, all distances within this report relate to the shortest distance between two described points i.e., linear – 'as the crow flies'.

178. It is recognised that the baseline may not list all receptors within the study area, however it includes identified sensitive receptors from the reviews undertaken and is considered representative of the baseline at the time of the desk-based assessment. Furthermore, where

summarised or grouped, receptors have been selected to represent worst-case exposure locations (in accordance with

179. Table 19.2).

19.7.4.2 Construction Dust Assessment

180. The construction activities assessed as part of the dust assessment are based on information presented in Volume 1, Chapter 3: Project Description.

181. The construction dust assessment is primarily a tool to identify the proportionate level of mitigation required for the various construction activities.

182. Resultant effects ultimately depend on the effective application of this mitigation. Therefore, there can be uncertainty on how representative the assessment procedure and associated post-mitigated outcomes would be if appropriate mitigation is not secured.

183. To secure the necessary mitigation an Outline Air Quality Management Plan (Document 8.1.2), included as part of the Outline CoCP, has been developed for the proposed onshore construction activities which adheres to industry good practice guidance for control measures and dust management.

184. At this stage the Outline Air Quality Management Plan, part of the Outline CoCP, provides principles for agreement, which will subsequently be developed to ensure that all required mitigation measures are appropriately secured via a requirement in the DCO that will be approved by Lincolnshire County Council (as host Authority) prior to works commencing.

185. Furthermore, a MDS has been defined and considered to facilitate a precautionary assessment and provide greater confidence in the assessment outcomes. See Section 19.5.2 for further information.

19.7.4.3 Road Traffic Emissions Assessment

Construction Phase

186. Dispersion modelling is inherently uncertain and is principally reliant on the accuracy and representativity of its inputs. In acknowledgement of this, the ADMS-Roads dispersion model has been verified with representative publicly available local roadside monitoring data.

187. Following verification, all model output statistical parameters (used to evaluate model performance and uncertainty) are within LAQM.TG22 prescribed tolerances.

188. In addition, there is a widely acknowledged disparity between emission factors and ambient monitoring data. To help minimise any associated uncertainty when forming conclusions from the results, this assessment has utilised the latest Emissions Factors Toolkit (EFT) version 11.0 utilising COPERT 5.3 emission factors, and associated tools/datasets published by Defra.

189. Further detail on how uncertainty has been addressed is provided in Volume 3, Appendix 19.4: Road Traffic Dispersion Modelling.

190. Traffic data for the purposes of the modelling assessment is consistent with the analysis undertaken, and presented as part of Volume 1, Chapter 27: Traffic and Transport.

191. Furthermore, a series of conservative assumptions relating to the assessment of a MDS have been adopted to facilitate a precautionary assessment and provide greater confidence in the road traffic emissions assessment outcomes. See Section 19.5.2 for further information.

O&M Phase

192. For the purposes of facilitating a conservative screening exercise, peak vehicle movements generated during the operational phase have been assessed. This is based on information presented as part of Volume 1, Chapter 27: Traffic and Transport.

193. Use of peak vehicle movements within this context presents a precautionary assessment. See Section 19.5.2 for further information.

19.7.4.4 NRMM Emissions Assessment

194. The frequency and duration of NRMM that have been assessed are based on information presented in Volume 1, Chapter 3: Project Description.

195. A 50m distance screening threshold in relation to NRMM emissions has been applied to the Order Limits to inform the spatial extent of affected receptors (human and ecological).

196. The use of a 50m distance screening threshold in relation to NRMM emissions has been considered appropriate and accepted by statutory consultees and the Planning Inspectorate for other NSIPs.

197. A MDS has been defined in relation to the NRMM emissions assessment, further detail is provided in Section 19.5.2.

19.7.4.5 Vessel Emissions Assessment

198. Vessel movements used for the purposes of this screening assessment are consistent with the analysis undertaken, and presented within Volume 1, Chapter 3: Project Description. Vessel movements for all potential scenarios have been considered.

199. A MDS has been defined in relation to the vessel emissions assessment, further detail is provided in Section 19.5.2.

19.8 Impact Assessment

19.8.1 Construction

200. This section presents the assessment of impacts arising from the construction phase of the Project.

19.8.1.1 Impact 1: Dust/PM_{10} emissions generated from temporary onshore construction works

201. The assessment of construction dust has utilised the methodology prescribed in Volume 3, Appendix 19.1: Construction Dust Assessment Methodology.

202. Where figures relating to area or volume of the Order Limits, approximate number of construction vehicles or distances to receptors are given, these relate to thresholds as defined in the IAQM guidance (IAQM, 2016) to guide the assessor to define the dust emissions magnitude and sensitivity of the area.

203. It is acknowledged that the onshore Order Limits are also split into segments. However, given that the exact locations and timing of construction activities will be subject to detailed design, the onshore construction areas have been assessed collectively, rather than in discrete segments. This aggregated approach accounts for simultaneous construction activities across the onshore Order Limits. It also increases the opportunity for greater derived sensitivities and dust emission magnitudes, and therefore impacts. See Section 19.5 for further information.

Assessment Screening

204. There are both human and ecological receptors within the relevant screening distances. Therefore, an assessment of construction dust on both human and ecological receptors has been undertaken.

Potential Dust Emission Magnitude

205. No demolition activities are proposed as part of the onshore construction phase. As such, impacts associated with demolition activities have therefore not been considered further and are screened out.

206. Earthworks are required across the onshore Order Limits a total area greater than the 10,000m^2 IAQM threshold. The onshore ECC extends 70km in length to the grid connection point. Construction activities will be carried out in a sequence, with different areas of the Order Limits being worked at different times according to the activity phasing. In addition, it is anticipated that >10 heavy earth moving vehicles may be active at any given time. Therefore, the dust emission magnitude for earthworks is considered to be large.

207. Onshore construction activities will be limited to the erection of the OnSS and associated buildings, with further activities for the joint bays and the Transition Joint Bays (TJBs) at the landfall. Indicative building dimensions have been provided to inform the total building volume, which is greater than the 100,000m^3 IAQM threshold. Further to this, the use of piling and potentially dusty materials (e.g., concrete) will be required. Therefore, the dust emission magnitude for construction is considered to be large.

208. Given the scale of onshore construction works, the number of outward HDV movements in any worst-case day will be greater than 50. In addition, unpaved road lengths are likely to exceed the 100m IAQM threshold. Therefore, the dust emission magnitude for trackout is considered to be large.

209. The determined dust emission magnitude for each activity is summarised in Table 19.14.

Table 19.14 Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	n/a
Earthworks	Large
Construction	Large
Trackout	Large

Sensitivity of the Area

Dust Soiling Impacts

210. It is estimated there are 10-100 existing residential properties (high sensitivity receptors) within 20m of the construction working area. Further to this, there are predicted to be 10-100 high sensitivity receptors located within 20m of road links up to 500m of the proposed construction access points (commensurate of a large site). The sensitivity of the area with respect to dust soiling impacts on people and property is considered to be high in relation to earthworks, construction, and trackout.

Human Health Impacts

211. As discussed in Section 19.4, no local background PM_{10} monitoring exists in proximity to the onshore elements of the Project. The Defra supplied background maps (2018 reference year) have therefore been utilised to characterise the PM_{10} background concentrations (presented in Table 19.10).

212. The maximum 2019 mapped background PM_{10} concentration for the $1km^2$ grid squares covering any potential onshore construction works is estimated to be 16.8µg/m³ and therefore falls into the <24µg/m^3 class.

213. The number of high sensitivity receptors within 20m of potential construction works, and within 20m of potential trackout routes has been utilised to determine the sensitivity of the area with respect to human health impacts. With use of the IAQM assessment matrices (presented in Appendix 19.1: Construction Dust Assessment Methodology), this is classified as low in relation to earthworks, construction, and trackout.

Ecological Impacts

214. There are several designated ecological sites within 20m of potential construction working areas. This includes the Greater Wash SPA, the Sea Bank Clay Pits SSSI, the Havenside LNR, and several Local Wildlife Sites (LWS) and Lincolnshire Wildlife Trust reserves (LWT).

215. In line with the IAQM guidance (IAQM, 2016), and in consultation with the Project Ecologist, the sensitivity of the designated ecological sites has been determined. The Greater Wash SPA is primarily designated for the protection of bird populations, which are unlikely to be sensitive to dust given their mobility. As such, emphasis is placed on the habitats which support these bird populations. As the habitats are intertidal / subtidal, they are washed twice daily by tidal actions and therefore the smothering of vegetation / organisms due to dust is unlikely to be significant. Similarly, the dilution effect of the seawater is likely to reduce the risk of increases in pH and nutrient levels. As the SPA is an international designation but not necessarily sensitive to dust, it has been classified as a medium sensitivity receptor.

216. In relation to the Sea Bank Clay Pits SSSI, the aquatic plants and invertebrates may potentially be impacted by smothering due to dust deposition . However, impacts from chemical changes are unlikely as the SSSI citation quotes the designation as already nutrient rich. Given this, as the SSSI is a national designation with potentially dust sensitive features /

species, it has been classified as a medium sensitivity receptor.

217. The Havenside LNR, and other LWS/LWT are local designations and have therefore been classified as low sensitivity in consultation with the Project Ecologist and following the IAQM guidance.

218. From review of the identified trackout routes, there are only LWS/LWT present within 20m or 50m. Given this and with use of the IAQM assessment matrices , the sensitivity of the study area with respect to ecological impacts from trackout is low.

219. In line with the IAQM assessment matrices, the sensitivity of the ecological receptors within the study area to impacts from earthworks and construction, is considered to be medium. This is considered appropriate taking onto consideration the relevant screening distances of the Greater Wash SPA and Sea Bank Clay Pits SSSI.

220. A summary of the sensitivity of the surrounding area is detailed in Table 19.15.

Table 19.15 Sensitivity of the Area

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

Risk of Impacts

221. The outcome of the assessment of the potential magnitude of dust emissions, and the sensitivity of the area are combined in Table 19.16 below to determine the risk of impact. The defined level of risk has been used to inform the selection of appropriate mitigation, which constitutes embedded mitigation for the Project.

222. The IAQM construction dust assessment methodology does not include the consideration of embedded mitigation measures when determining the potential risk of dust impacts, rather is used to define this mitigation.

Table 19.16 Risk of Dust Impacts (Without Mitigation)

Potential Impact	Activity		
	Earthworks	Construction	Trackout
Dust Soiling	High Risk	High Risk	High Risk
Human Health	Low Risk	Low Risk	Low Risk
Ecological	Medium Risk	Medium Risk	Low Risk

223. Following the construction dust assessment, the risk of impacts from potential worst-case onshore construction works (in the absence of mitigation) are summarised as follows:

- High risk in relation to dust soiling impacts on people and property;
- Low risk in relation to human health impacts; and
- Medium risk in relation to ecological impacts.

224. Potential dust effects during the construction phase are considered to be temporary and short-term (up to 51-months) and may only arise at particular times (i.e., certain activities and/or meteorological conditions).

225. Nonetheless, commensurate with the above designation of dust risk and maximum high risk determined, mitigation measures are identified by IAQM guidance (IAQM, 2016) to ensure that any potential impacts arising from any onshore construction works are minimised and, where possible, completely removed. The importance of these measures was highlighted by consultees in S42 consultation responses (see Table 19.5).

226. These measures represent embedded mitigation for the Project and are included within the Outline Air Quality Management Plan, provided as part of the Outline CoCP. A CoCP is a requirement of the DCO and will be submitted to the relevant Local Planning Authority in consultation with Lincolnshire County Council, Environment Agency, the relevant nature conservation body and the MMO where applicable. for approval post-consent, in advance of works. The requirement of a CoCP also ensures the submission of an Air Quality Management Plan and Soil Management Plan, which will align with the initial plans included in the DCO application.

227. As such, in accordance with the IAQM construction guidance and with reference to the methodology described in Volume 3, Appendix 19.1: Construction Dust Assessment Methodology, residual effects are concluded to be negligible and **not significant** in terms of the EIA Regulations.

19.8.1.2 Impact 2: Road traffic emissions generated from temporary construction vehicle movements

Human Receptors

228. Consistent with the assessment criteria outlined in Section 19.7, road traffic flows generated by the Project on the local road network have been compared against the EPUK & IAQM prescribed screening thresholds.

229. Table 19.17 outlines the affected road network in relation to human receptors.

Table 19.17 Construction Phase Affected Road Network (Human Receptors)

Road Link	AADT HDV	LDV
Outside an AQMA		
A158 Skegness Road (west of ECC)	263	26
A52 Wainfleet Road (Haltoft End – east of ECC)	203	68
A52 Wainfleet Road (Haltoft End – west of ECC)	203	69
A16 (south of Boston, south of Kirton)	147	49
A17 (south of River Welland)	122	9
A17 (between A16 and A1121)	162	13
A17 (west of A1221)	189	17
A16 (south of A17)	175	93

Road Link	AADT	
	HDV	LDV
A16 between A52 (Boston) and A155	190	39
A16 between A155 and A158	190	36
A16 between A158 and A1028	294	18
A16 north of A1028/A1104	294	16
A1028 between A158 and A16	204	0
A158 between A1028 and A16	204	17
A158 west of A16	294	13
Within or Adjacent to an AQMA		
A16 Boston	113	126
A52 Boston	56	38
A16 (south of Boston, north of Kirton)	33	51

230. Sensitive human receptors are found within 200m of the affected road network (Section 19.4.1.2), and further detailed assessment is required.

231. Dispersion modelling has therefore been undertaken for the affected road network. The spatial extent of the modelled domain (modelled road links and human receptors considered) is illustrated in Figure 19.2.1.

232. A summary of modelled results is provided below. Exhaustive results are presented in Volume 3, Appendix 19.4: Road Traffic Dispersion Modelling.

NO_2 Modelling Results

233. The maximum predicted annual mean NO_2 concentration at all existing receptors during the 2019 BC scenario is at R95 with a predicted concentration of 64.4µg/m^3; this represents 161.0% of the AQAL. Receptor R95 is located on the façade of a residential property, adjacent to the A52/A16 roundabout in Boston and within the AQMA.

234. Receptor R95 is located at a closer proximity (~15m closer) to the roundabout than BBC diffusion tube 1; where a 2019 annual mean NO_2 concentration of 49.2µg/m^3 was recorded. A higher modelled 2019 BC concentration at R95 vs. diffusion tube 1 is therefore expected.

235. The maximum predicted annual mean NO_2 concentration at existing receptors (inclusive of committed developments) during the planned construction phase (2027 DS) is at Receptor R95 with a predicted concentration of 35.8µg/m^3; this represents 89.5% of the AQAL. The change in the annual mean NO_2 concentrations at this location, during the construction of the onshore elements of the Project (2027 DS vs. 2027 DM) relative to the AQAL is 0.5%.

236. The maximum observed increase in annual mean NO_2 concentrations at all existing receptors as a result of construction road traffic flows is 1.2% at Receptor R45 – which is located on the façade of a residential property, at the roadside of the A158 East Street, in Horncastle. The resultant concentration at R45 during the planned construction phase (2027 DS) is 14.2µg/m^3; this represents 35.5% of the AQAL (i.e. well below).

237. In accordance with EPUK & IAQM guidance, the impact of the construction phase of the

Project on annual mean NO_2 concentrations at all relevant existing receptors is considered to be 'negligible'. Given the marginal increase in annual mean NO_2 concentrations associated with the construction phase of the onshore elements of the Project, and that there are no predicted exceedances of the annual mean NO_2 AQAL in the 2027 DS scenario, unmitigated effects associated with annual mean NO_2 concentrations at all assessed receptor locations are therefore considered to be **not significant** in terms of the EIA regulations.

238. The empirical relationship given in LAQM.TG22 states that exceedances of the 1-hour mean NO_2 AQAL are unlikely to occur where annual mean concentrations are <60µg/m^3. Annual mean NO_2 concentrations predicted at all receptor locations are well below this limit in the 2027 DS scenario. Therefore, it is unlikely that an exceedance of the 1-hour mean AQAL will occur. Effects associated with likely 1-hour mean NO_2 concentrations at all assessed receptor locations are therefore considered to be **not significant** in terms of the EIA regulations.

PM_{10} Modelling Results

239. The maximum predicted annual mean PM_{10} concentration at all existing receptors during the 2019 BC is at Receptor R95 with a predicted concentration of 26.1µg/m^3, this represents 65.3% of the AQAL.

240. The maximum predicted annual mean PM_{10} concentration at existing receptors (inclusive of committed developments) during the planned construction phase (2027 DS) is at Receptor R95 with a predicted concentration of 25.1µg/m^3; this represents 62.8% of the AQAL (i.e., 'well-below'). The change in the annual mean PM_{10} concentrations at this location, during the construction of the onshore elements of the Project (2027 DS vs. 2027 DM) relative to the AQAL is 0.3%.

241. The maximum observed increase in annual mean PM_{10} concentrations at all existing receptors as a result of the construction road traffic flows is 0.6% at Receptor R146. Receptor R146 is located on the façade of a residential property near the A16/A158 roundabout. The resultant concentration predicted at R146 during the planned construction phase (2027 DS) is 17.6µg/m^3; this represents 44% of the AQAL (i.e. well below).

242. In accordance with EPUK & IAQM guidance, the impact of the Project on annual mean PM_{10} concentrations at all relevant existing receptors is considered to be 'negligible'. Given the marginal increase in annual mean PM_{10} concentrations associated with the construction phase of the onshore elements of the Project, and that there are no predicted exceedances of the annual mean PM_{10} AQAL, unmitigated effects associated with annual mean PM_{10} concentrations at all assessed receptor locations are therefore considered to be not significant in terms of the EIA regulations.

243. Based upon the maximum predicted annual mean PM_{10} concentration of 25.1µg/m^3 (predicted at R95 in 2027 DS), this equates to 13-days where 24-hour mean PM_{10} concentrations are predicted to be greater than 50µg/m^3. This is well below the 35 permitted exceedances, and therefore the number of maximum exceedances is in compliance with the 24-hour mean AQAL. Effects associated with likely 24-hour mean PM_{10} concentrations at all assessed receptor locations are therefore considered to be not significant in terms of the EIA

regulations.

$PM_{2.5}$ Modelling Results

244. The maximum predicted annual mean $PM_{2.5}$ concentration at all existing receptors during the 2019 BC is at Receptor R95 with a predicted concentration of 16.0µg/m^3, this represents 80.0% of the AQAL.

245. The maximum predicted annual mean $PM_{2.5}$ concentration at existing receptors (inclusive of committed developments) during the planned construction phase (2027 DS) is at Receptor R95 with a predicted concentration of 15.0µg/m^3; this represents 75.0% of the AQAL. The change in the annual mean $PM_{2.5}$ concentrations at this location, during the construction of the onshore elements of the Project (2027 DS vs. 2027 DM) relative to the AQAL is 0.3%.

246. The maximum observed increase in annual mean $PM_{2.5}$ concentrations at all existing receptors as a result of the construction road traffic flows is 0.6% at Receptor R146. The resultant concentration at R146 during the planned construction phase (2027 DS) is 9.6µg/m^3; this represents 48.0% of the AQAL (i.e. well below).

247. In accordance with EPUK & IAQM guidance, the impact of the Project on annual mean $PM_{2.5}$ concentrations at all relevant existing receptors is considered to be 'negligible'. Given the marginal increase in annual mean $PM_{2.5}$ concentrations associated with the construction phase of the onshore elements of the Project, and that there are no predicted exceedances of the annual mean $PM_{2.5}$ AQAL, unmitigated effects associated with annual mean $PM_{2.5}$ concentrations at all assessed receptor locations are therefore considered to be not significant in terms of the EIA regulations.

Summary

248. Road traffic effects associated with the construction phase on concentrations of NO_2, PM_{10} and $PM_{2.5}$ at human receptor locations are found to be **not significant** in terms of the EIA regulations.

249. Furthermore, onshore construction works are expected to last up to 51-months and as such, any consequential impacts onto local road traffic flows are believed to be temporary, with no long-term deterioration of conditions. Implementation of road traffic air quality mitigation measures is therefore not required.

Ecological Receptors

250. Figure 19.3.1 provides an illustration of the proposed main public road network routing arrangements (referred to as Ecological Road Traffic Screening Routes), along with 200m buffers from these roads for initial screening, and the designated ecological sites which then progressed to detailed assessment.

251. It should be noted that the Ecological Road Traffic Screening Routes are based on the Core and Local Access Routes established as part of Volume 1, Chapter 27: Traffic and Transport. The spatial extent of these links has been extended to ensure all possible interactions with nearby sensitive ecological designations are captured. This is likely to represent a conservative

assessment, as it assumes there is no reduction in vehicle movements generated by onshore activities with distance from the Core and Local Access Routes.

252. The traffic flows utilised in the screening assessment include vehicle movements associated with relevant committed developments and live projects/plans in the assessment area.

253. Table 19.18 details the extent of ecological designations located within 200m of the Ecological Road Traffic Screening Routes. Where the traffic flow is above the IAQM screening thresholds, this is marked in bold (i.e. the affected road network).

Table 19.18 Ecological Designations Within 200m of Ecological Road Traffic Screening Routes

ID	Site	Designation	Road Link	Project Alone		In-Combination	
				HDV	Total AADT	HDV	Total AADT
ER1	Candlesby Hill	SSSI	A1028 between A158 and A16	**204**	204	**204**	204
ER2	Dalby Hill	SSSI	Not assessed – geological features				
ER3	Jenkins Carr	SSSI	A16 between A155 and A158	190	226	190	226
ER4	Keal Carr	SSSI	A16 between A155 and A158	190	226	190	226
ER5	South Thoresby Warren	LNR	A16 north of A1028/A1104	**294**	310	**294**	555
ER6	A16 Road Verge, Burwell North	LWS	A16 north of A1028/A1104	**294**	310	**294**	555
ER7	A16 Road Verge, Dalby Bar	LWS	A16 between A158 and A1028	**294**	312	**294**	312
ER8	A16 Road Verge, White Pit	LWS	A16 north of A1028/A1104	**294**	310	**294**	555
ER9	A16 Road Verges, Green Man Plantation	LWS	A16 north of A1028/A1104	**294**	310	**294**	555
ER10	A16 Verges North of the River Glen	LWS	A16 (south of A17)	175	268	**245**	394
ER11	Banovallum House	LWT	A158 west of A16	**294**	307	**294**	307
ER12	Bluestone Heath Road Verges, East	LWS	A16 north of A1028/A1104	**294**	310	**294**	555
ER13	Calceby Beck, Furze Closes to A16	LWS	A16 north of A1028/A1104	**294**	310	**294**	555

ID	Site	Designation	Road Link	Project Alone		In-Combination	
				HDV	Total AADT	HDV	Total AADT
ER14	Callow Carr	LWS	A16 between A158 and A1028	**294**	312	**294**	312
ER15	Candlesby Hill Quarry	LWT	A1028 between A158 and A16	**204**	204	**204**	204
ER16	Chalk Pit Lane Verges, Candlesby	LWS	A1028 between A158 and A16	**204**	204	**204**	204
ER17	Cowdyke Plantation	LWS	A16 north of A1028/A1104	**294**	310	**294**	555
ER18	Dawber Lane Road Verges	LWS	A1028 between A158 and A16	**204**	204	**204**	204
ER19	Frampton Hall	LWS	Millfield Lane East/Low Road/Streetway/Wyberton Roads	37	42	37	42
ER20	Gunby Meadow	LWS	A158 Skegness Road (west of ECC)	**263**	289	**263**	289
			Marsh Lane (between ECC and A158)	66	74	66	74
ER21	Gunby Park	LWS	A158 between A1028 and A16	**204**	221	**204**	221
			A1028 between A158 and A16	**204**	204	**204**	204
			A158 Skegness Road (west of ECC)	**263**	289	**263**	289
ER22	Hagworthingham Meadow	LWS	A158 west of A16	**294**	307	**294**	307
ER23	Hall Weir	LWS	Station Road/Skeldyke Road/Nidd's Lane/Marsh Road	67	78	67	78
			A16 (south of Boston, north of Kirton)	33	84	103	417
ER24	Hobhole Bank	LWS	Cut End Road	16	19	16	19
ER25	Hobhole Drain, Baker's Bridge South	LWS	A52 Wainfleet Road (Haltoft End)	**203**	273	**203**	577
			Cut End Road	16	19	16	19
ER26	Horncastle Canal Grassland	LWS	A158 west of A16	**294**	307	**294**	307
ER27	Keal Carr, Keal Carr East, Keal Carr South	LWS/LWT	A16 between A155 and A158	190	226	190	226

ID	Site	Designation	Road Link	Project Alone		In-Combination	
				HDV	Total AADT	HDV	Total AADT
ER28	Ketsby Beck, Ketsby to Calceby	LWS	A16 north of A1028/A1104	**294**	310	**294**	555
ER29	Mill Lane Road Verges	LWS	A1028 between A158 and A16	**204**	204	**204**	204
ER30	Moulton River	LWS	A17 (south of River Welland)	122	131	122	131
ER31	Pinchbeck Marsh	LWS	A16 (south of A17)	175	268	**245**	394
ER32	Pinfold Lane, White Pit	LWS	A16 north of A1028/A1104	**294**	310	**294**	555
ER33	Risegate Eau	LWS	A16 (south of A17)	175	268	**245**	394
ER34	River Glen Corridor	LWS	A16 (south of A17)	175	268	**245**	394
ER35	River Lymn (Partney Bridge to Mill Bridge)	LWS	A16 between A155 and A158	190	226	190	226
			A158 between A1028 and A16	**204**	221	**204**	221
ER36	Riverdale Meadow, Hagworthingham	LWS	A158 west of A16	**294**	307	**294**	307
ER37	South Bank Fosdyke	LWS	A17 (north of River Welland)	95	126	95	126
			A17 (south of River Welland)	122	131	122	131
ER38	South Forty Foot Drain	LWS	A1121 between Boston and A17	56	60	56	192
			A17 (between A16 and A1121)	162	175	162	175
			A17 (west of A1221)	189	206	189	206
			A16 (south of Boston, north of Kirton)	33	84	103	417
ER39	Spendluffe Meadows	LWS/LWT	B1449 Long Lane	74	83	74	328
ER40	The Lymn	LWS	B1195 (Thorpe St. Peter)	59	81	59	81
ER41	Thunker Hollow Road Verge	LWS	A158 west of A16	**294**	307	**294**	307
ER42	Vale Farm Meadow	LWS	A16 between A155 and A158	190	226	190	226
ER43	Vernatt's Drain	LWS	A16 (south of A17)	175	268	**245**	394

ID	Site	Designation	Road Link	Project Alone		In-Combination	
				HDV	Total AADT	HDV	Total AADT
ER44	Well Vale Estate, Alford Road Plantation	LWS	A1104	74	83	74	328
ER45	Well Vale Estate, Dadley's Stone Wood	LWS	A1104	74	83	74	328
ER46	Welton le Marsh Quarry Verges	LWS	A1028 between A158 and A16	**204**	204	**204**	204

254. Four SSSIs are found within 200m of the Ecological Road Traffic Screening Routes. One is designated for geological interest (Dalby Hill SSSI) and is therefore not considered sensitive or assessed further.

255. Construction road traffic flows (alone and in-combination with other relevant plans/projects) are above the IAQM prescribed screening criteria on Ecological Road Traffic Screening Routes within 200m of ER1 (Candlesby Hill SSSI).

256. The South Thoresby Warren LNR, and several LWS/LWT are found within 200m of the Ecological Road Traffic Screening Routes. As displayed in Table 19.18, 25 local sites are considered due to project alone and in-combination construction road traffic flows. A further five local sites are then included due to in-combination construction road traffic flows only.

257. Consistent with the staged screening procedure outlined within Section 19.7, further assessment with the use of dispersion modelling to quantify the effect on Critical Loads/Levels been undertaken for the identified ecological sites. This includes one SSSI and 30 local designations. The spatial extent of the modelled domain is illustrated in Figure 19.3.1.

258. Effects on all other ecological designations can be considered not significant.

259. Results presented herein relate to the maximum modelled impact of each individual ecological designation requiring detailed assessment (i.e., where impacts cannot be screened out), and as such, represents a conservative outlook. Exhaustive results are presented in Volume 3, Appendix 19.4: Road Traffic Dispersion Modelling.

260. As discussed in Section 19.7, effects associated with modelled changes can be classed as insignificant where they are <1% of the Critical Levels and/or Critical Loads. This screening exercise has also comprised the consideration of in-combination impacts (i.e. road traffic movements associated with committed developments and relevant project and plans).

NO_x Modelling Results

261. Table 19.18 of Volume 3, Appendix 19.4: Road Traffic Dispersion Modelling presents the Project's maximum contribution in 2027 (alone and in-combination) to annual mean NO_x concentrations relative to the Critical Level (30µg/m^3) for screening.

262. At the SSSI (ER1), the maximum increases in annual mean NO_x concentrations as a result of

the Project (both alone and in-combination) are predicted to be <1% of the Critical Level and impacts are concluded as negligible. Further assessment of impacts is therefore not required and resultant effects can be considered not significant.

263. At the local sites ER14, ER15, ER16, ER17, ER18, ER20, ER21, ER26, ER28, ER29, ER32, ER35 and ER36, the maximum increases in annual mean NO_x concentrations as a result of the Project (both alone and in-combination), are predicted to be <1% of the Critical Level and impacts are concluded as negligible. Further assessment of impacts is therefore not required and resultant effects can be considered not significant.

264. At the remaining local sites ER5, ER6, ER7, ER8, ER9, ER10, ER11, ER12, ER13, ER22, ER25, ER31, ER33, ER34, ER41, ER43 and ER46, the maximum increases in annual mean NO_x concentrations as a result of the Project (both alone and/or in-combination) are predicted to be >1% of the Critical Level. Further assessment of impacts is therefore required. This comprises calculation of the total maximum annual mean NO_x concentration to determine whether the Critical Level (30µg/m^3) will be exceeded (presented in Table 19.19 of Volume 3, Appendix 19.4: Road Traffic Dispersion Modelling).

265. At the majority of local sites, no exceedances of the Critical Level (30µg/m^3) are predicted across the three model scenarios (DM-C, DM and DS). Further assessment of impacts is therefore not required and resultant effects can be considered not significant.

266. Exceedances of the Critical Level are predicted at ER10, ER25, ER31, ER33 and ER34 (where the maximum modelled contributions are also >1% for both Project alone and in-combination). These exceedances occur across all three model scenarios and therefore occur in the future baseline regardless of the Project and/or committed developments and cumulative projects/plans coming forward.

267. In consultation with the Project Ecologist, the exceedances at each of the designated ecological sites were investigated and each is summarised in turn. A full discussion with images is presented in Volume 3, Appendix 19.4: Road Traffic Dispersion Modelling, Section 19.10.2.1.

- ER10 – a peripheral strip of the designation closest to the A16 roadside experiences exceedances. Given this is a small area of the overall site, effects are considered not significant;
- ER25 – the exceedances at three receptors only occur on the road/bridge over the LWS and not the actual LWS habitat. Given this, effects are considered not significant;
- ER31 – a peripheral strip of the designation closest to the A16 roadside experiences exceedances. Given this is a small area of the overall site, effects are considered not significant;
- ER33 – the exceedances at two receptors only occur on the road/bridge over the LWS and not the actual LWS habitat. Given this, effects are considered not significant; and
- ER34 – the exceedances at two receptors only occur on the road/bridge over the LWS and not the actual LWS habitat. Given this, effects are considered not significant.

268. As highlighted above, the effects in relation to the annual mean NO_x Critical Level at each of the designated ecological sites are determined as not significant.

Nutrient Nitrogen Deposition Modelling Results

269. Table 19.20 of Volume 3, Appendix 19.4: Road Traffic Dispersion Modelling presents the Project's maximum contribution in 2027 (alone and in-combination) to nutrient nitrogen deposition rates relative to the minimum habitat specific Critical Load for screening.

270. At the SSSI (ER1), the maximum increases in nutrient nitrogen deposition as a result of the Project (both alone and in-combination) are predicted to be <1% of the minimum Critical Load and impacts are concluded as negligible. Further assessment of impacts is therefore not required and resultant effects can be considered not significant.

271. At the local sites, the maximum increases in nutrient nitrogen deposition as a result of the Project (both alone and in-combination) are predicted to be <1% of the minimum Critical Load and impacts are concluded as negligible. Further assessment of impacts is therefore not required and resultant effects can be considered not significant.

Acid Deposition Modelling Results

272. Table 19.21 of Volume 3, Appendix 19.4: Road Traffic Dispersion Modelling presents the Project's maximum contribution in 2027 (alone and in-combination) to acidic deposition rates relative to the minimum MaxN Critical Load for initial screening, as per the APIS critical load function guidance (APIS, 2023).

273. At the SSSI (ER1), the maximum increases in nutrient nitrogen deposition as a result of the Project (both alone and in-combination) are predicted to be <1% of the minimum MaxN Critical Load and impacts are concluded as negligible. Further assessment of impacts is therefore not required and resultant effects can be considered not significant.

274. At the local sites, the maximum increases in nutrient nitrogen deposition as a result of the Project (both alone and in-combination) are predicted to be <1% of the minimum MaxN Critical Load and impacts are concluded as negligible. Further assessment of impacts is therefore not required and resultant effects can be considered not significant.

Summary

275. In consideration of the above outcomes, air quality impacts from road traffic on all ecological designations can be considered negligible. Resultant effects are concluded to be not significant in terms of the EIA Regulations. No further assessment is therefore required.

19.8.1.3 Impact 3: Emissions generated from temporary construction NRMM

276. The IAQM construction guidance (IAQM, 2016) states that experience of assessing exhaust emissions from NRMM suggests that they are unlikely to result in a significant effect in terms of the EIA regulations.

277. Despite this, a qualitative assessment of NRMM emissions has been undertaken to inform the likelihood of a significant effect arising. The full assessment of Impact 3 is presented in Volume 3, Appendix 19.2: NRMM Emissions Assessment. The study area is presented in Figure 19.4.1.

278. It is acknowledged that the onshore Order Limits is split into segments. However, given

that the exact locations and timing of construction activities will be subject to detailed design, which will influence the use of NRMM, the onshore construction areas have been assessed collectively, rather than in discrete segments. This aggregated approach accounts for simultaneous construction activities across the Order Limits.

279. The assessment has considered embedded mitigation in relation to NRMM, which includes controls relating to NRMM operation and emissions standards based on Defra's guidance (Defra, 2022). According to Defra guidance, following implementation of these controls, effects are considered not significant. These measures are included in the Outline Air Quality Management Plan (Document 8.1.2), which forms part of the Outline CoCP.

Human Receptors

280. Human receptors are present within 50m of potential NRMM activity associated with the landfall connection, and onshore ECC and 400kV cable corridor elements of the Project. There are no high sensitivity human receptors near the OnSS construction area (which would represent worst-case exposure in terms of construction and NRMM activity). Construction activities are carried out in a sequence and an overlap of multiple activities at the same time at any location is unlikely. Furthermore, given the phased nature and movement of works, exposure at any given location will be temporary. The locations of Temporary Construction Compounds (TCCs) and associated NRMM activity is more certain, however the overall construction period and exposure is still considered short-term (i.e., up to 51-months).

281. The maximum annual mean background concentrations across the study area are well below the respective AQALs. Concentrations across the full extent of the Order Limits are expected to vary and be lower relative to the maximum reported.

282. Whilst taking into account the embedded mitigation as well as the short-term, transient, phased nature of the construction works, and the background pollutant concentrations, the likelihood of NRMM causing an exceedance is therefore low, as supported by IAQM guidance (IAQM, 2016). Potential impacts from NRMM emissions on human receptors are therefore considered negligible, with the resultant effect short-term, temporary and **not significant** in terms of the EIA Regulations.

Ecological Receptors

283. Designated ecological sites are present within 50m of potential NRMM activity associated with the landfall connection, onshore ECC and 400kV cable corridor, and OnSS elements of the Project. Construction activities are temporary, lasting up to a maximum of 51-months but likely to be far less at any given location.

284. Several of the designated ecological sites are in proximity to potential landfall connection activities and associated NRMM activity. Only <0.01% of the overall Greater Wash SPA designation is potentially exposed to NRMM activity, and approximately 2.1% of the Sea Bank Clay Pits SSSI. These affected areas are likely to be further reduced as a large proportion of the landfall activities are expected to be below ground level i.e., associated with trenchless techniques. This is likely to minimise any impacts from NRMM emissions on the designated

ecological sites.

285. One designated ecological site is located near the OnSS construction area. This is the Risegate Eau LWS, however, only 14.9% of the designation is potentially impacted by NRMM activity.

286. The maximum annual mean background concentrations across the study area are well below the respective Critical Levels. Concentrations across the full extent of the Order Limits are expected to vary and be lower relative to the maximum reported.

287. Whilst taking into account the embedded mitigation as well as the short-term, transient, phased nature of the construction works, the background pollutant concentrations and the potential areas of the designations affected, the likelihood of NRMM causing an exceedance or significant effect is therefore low, as supported by IAQM guidance (IAQM, 2016). Potential impacts from NRMM emissions on ecological receptors are therefore considered negligible, with the resultant effect short-term, temporary and not significant in terms of the EIA Regulations.

19.8.1.4 Impact 4: Emissions generated from temporary offshore construction vessel movements

288. The full assessment of Impact 4 is presented in Volume 3, Appendix 19.3: Offshore Activities Assessment, whilst the study area is presented in Figure 19.5. A summary is provided below. The assessment focuses on the offshore and onshore interface, at route segment ECC1: Landfall to A52 – Hogsthorpe.

289. Offshore vessel movements associated with the Project would represent a small number of overall vessel traffic in the North Sea, therefore accounting for a small proportion of total emissions. Further information is provided within Volume 1, Chapter 15: Shipping and Navigation.

290. Furthermore, vessel emissions within the North Sea are regulated by legislation. The North Sea is a designated Emissions Control Area under The International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI, where strict pollutant emission limits apply. 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, emission contributions from vessel emissions are expected to reduce further in the future.

291. The maximum projected background concentrations reported for the onshore locations likely to be affected by nearshore vessel movements are well below the corresponding AQALs and Critical Levels.

292. The assessment determined that vessel movements associated with the ‘Offshore Export Cable Installation’ activity, i.e., movements for main cable laying, main cable jointing, main cable burial and support vessels, are the only vessel movements likely to occur within 250m and/or 1km of sensitive onshore receptors (at the location of the offshore and onshore interface).

293. The total number of vessel movements estimated to occur throughout the construction

phase within 250m and/or 1km of onshore works are below the LAQM.TG22 screening thresholds, as presented in Table 19.19. Furthermore, actual annual movements are anticipated to be lower than those values used for screening. Onshore construction works are expected to last up to 51 months, and as such impacts are considered to be negligible, with no long-term deterioration of conditions.

Table 19.19 Number of Construction Vessel Movements Within Proximity of an Onshore Receptor

Type	Vessel Movements (Round Trips)	Vessel Movements [A]
Main Cable Laying Vessels	20	40
Main Cable Jointing Vessels	16	32
Main Cable Burial Vessels	16	32
Support Vessels	1,070	2,140
Total	1,122	2,244
LAQM.TG22 Screening Criteria	**Exposure within 250m**	**5,000**
	Exposure within 1km	**15,000**

Note:
[A] The total number of vessels movements (round trips) has been multiplied by two to calculate the total number of movements (one ship generating two movements).

294. Whilst taking the above into account, in conjunction with baseline conditions, emissions from vessels associated with the construction phase are considered to be short-term, temporary and not significant in terms of the EIA Regulations.

19.8.2 Operations and Maintenance

295. This section presents the assessment of impacts arising from the O&M phase of the Project.

296. Once operational, activities will be limited to maintenance activities. These are expected to be intermittent and infrequent in comparison to the assessed construction activities.

297. Effects associated with all construction phase assessment are considered to be not significant. For these reasons, operational activities are not anticipated to exceed the construction phase worst-case criteria assessed and impacts are considered to be not significant.

19.8.2.1 Impact 1: Operational phase traffic movements

298. In relation to likely O&M vehicle movements, these will predominantly be LDV movements associated with visits to the unstaffed OnSS. It is anticipated that at a maximum, there would be approximately 4-8 traffic movements per day – however these will be limited to a 2-week period for annual testing. Outside of this period, there are likely to be approximately 4-8 traffic movements per week. In addition, there is expected to be 1 visit to each joint bay per year. Based on this, LDV movements would not exceed the EPUK & IAQM screening thresholds i.e. 100 AADT near to or within an AQMA, and/or 500 AADT at locations outside of an AQMA.

299. Furthermore, during the O&M phase and aside from the routine activities described above, there is a possibility of the need to replace any failed major components at the OnSS – which

would require Abnormal Indivisible Load (AIL) movements. This would be a rare occurrence and therefore associated vehicle movements would not exceed the EPUK & IAQM screening thresholds for HDVs i.e. 25 AADT near to or within an AQMA, and/or 100 AADT at locations outside an AQMA.

300. As such, based on the above information, O&M phase vehicle movements are below the EPUK & IAQM screening thresholds. Therefore, operational effects from road traffic emissions can be screened out from requiring further assessment and are considered **not significant**.

19.8.3 Decommissioning

301. This section presents the assessment of impacts arising from the decommissioning phase of the Project.

19.8.3.1 Impact 1: Decommissioning phase traffic movements and other works

302. Decommissioning activities are expected to occur for up to three-years (however this will be driven primarily by offshore works), and are not anticipated to exceed the construction phase worst-case criteria assessed, given the following:

- Landfall and cable infrastructure is expected to be left in situ where appropriate, to abate potential future impacts and minimise the extent of decommissioning activities;
- Emission restrictions are expected to tighten in future years and in the interim before decommissioning activities occur (i.e., >25 years from installation). This forecast is based on the introduction and availability of cleaner technologies and fuels, alongside legislation. Therefore, emission contributions from potential future sources (e.g., vehicles, vessels and NRMM) generated during the decommissioning phase are expected to be lower in comparison to at present; and
- Air quality is expected to improve in future years, and in the interim before decommissioning activities occur; based on the introduction of policy and legislation, and availability of cleaner technologies. See Section 19.4.4 for further information.

303. These elements (alone and/or in combination) would result in a reduction in the level of significance in comparison to the assessment of construction effects. The outcomes of the construction phase assessment indicate that all impacts assessed following mitigation are not significant. Further assessment in relation to the decommissioning phase is therefore not required and effects are considered to be **not significant**.

304. Nonetheless, the decommissioning methodology would be finalised nearer to the end of the lifetime of the Project, to be in line with current guidance, policy and legislation. Any such methodology would be agreed with the relevant authorities and statutory consultees. Furthermore, the DCO includes a requirement for the submission of a Decommissioning Plan – considered embedded mitigation (Table 19.12).

19.9 Cumulative Impact Assessment

305. This cumulative impact assessment for Onshore Air Quality has been undertaken in accordance with the methodology provided in Volume 3, Appendix 5.3: Onshore Cumulative Effects Assessment Approach (document reference 6.3.5.3).

306. The projects and plans scoped in as relevant 'other developments' to the assessment of cumulative impacts to Air Quality are based upon a screening exercise undertaken on an initial long list of reasonably foreseeable other developments located within the Project's ZoI; be it consented schemes not built out or schemes for which planning consent is actively being sought.

307. Each project, plan or activity has been considered and scoped in or out on the basis of effect-receptor pathway, data confidence and the temporal and spatial scales involved.

308. The determination of the short list of other developments is documented in Appendix 5.3 (document reference 6.3.5.3).

309. The other developments scoped into the cumulative impact assessment of Onshore Air Quality are presented in Table 19.20.

Table 19.20 Other Developments Considered Within the Onshore Air Quality Cumulative Assessment

Development type	Project	Status
Residential Development	Gaysfield Road, 46 residential dwellings. BBC planning reference: B/20/0488.	Planning permission granted in November 2021.
Residential Development	Gaysfield Road, 20 residential dwellings. BBC planning reference: B/20/0489.	Planning permission granted in November 2021.
Residential Development	Watery Lane, 42 residential dwellings. BBC planning reference: B/21/0196.	Planning permission granted in January 2023.
Residential Development	West End, Hogsthorpe, 89 residential dwellings. ELDC planning reference: N/084/00809/19.	Outline planning permission granted September 2019.
Power Generation	Boston Alternative Energy Facility (BAEF).	Development consent granted in July 2023.
Power Generation	Low Farm Solar Farm. ELDC planning reference: S/195/0234.	Planning permission granted in March 2021.
Power Generation – to enable The Project	NGSS at Weston Marsh.	Non-statutory consultation commenced in January 2024.
Infrastructure	Naylor Farms proposed plant-based protein extraction facility and anaerobic digestor plant.	Planning application made December 2023.

310. These developments have been reviewed to inform the risks of cumulative impacts.

311. The cumulative MDS for the Project is outlined in Table 19.21. These impacts mirror the impacts assessed within Section 19.8, however explicitly consider emissions generated from relevant project and plans.

Table 19.21 Cumulative MDS

Impact	Scenario	Justification
Dust/PM_{10} emissions generated from construction works (in-combination with emissions generated from relevant project and plans)	Where the study area of the Project overlaps with the study area of another development.	A receptor may experience potential impacts from the Project in addition to impacts arising from another development.
Road traffic emissions generated from vehicle movements (in-combination with emissions generated from relevant project and plans). This considers construction and operational movements.	Where the study area of the Project overlaps with the study area of another development. This includes consideration of road and non-road sources.	A receptor may experience potential impacts from the Project in addition to impacts arising from another development.
Emissions generated from construction NRMM (in-combination with emissions generated from relevant project and plans)	Where the study area of the Project overlaps with the study area of another development.	A receptor may experience potential impacts from the Project in addition to impacts arising from another development.
Emissions generated from offshore vessel movements (in-combination with emissions generated from relevant project and plans)	Where the study area of the Project overlaps with the study area of another development.	A receptor may experience potential impacts from the Project in addition to impacts arising from another development.

312. Each impact is discussed in turn, followed by an independent discussion of the cumulative assessment of the NGSS.

313. Regarding the decommissioning phase, an assessment of potential cumulative impacts has not been undertaken. Given the decommissioning phase is anticipated to commence >25 years following installation, the cumulative projects and plans requiring assessment at this stage may be considerably different. The baseline of the study area is also likely to evolve in the period prior to the decommissioning phase, which would make undertaking a cumulative assessment less appropriate at this time.

19.9.1 Dust/PM_{10} emissions generated from construction works

314. A construction dust assessment has been conducted relating to potential impacts of dust/PM_{10} generated from construction activities. The outcomes of this exercise have informed the recommendation of controls to minimise or completely removed impacts. These measures are provided in the CoCP. This ensures their effective application. Effects are considered to be **not significant** in terms of the EIA Regulations.

315. Cumulative dust effects arising from construction activities could be experienced where construction activities from more than one scheme overlap at an affected receptor, dependent on the impact (e.g. dust soiling, human health and ecological).

316. There are a few instances of this, however for the majority (all but one receptor near

Naylor Farms) this is at a distance of >50m from both the Project and the additional cumulative project or plan.

317. Despite this, all schemes listed in Table 19.20 will have to consider potential construction dust impacts and apply best practice mitigation to effectively control dust emissions. The mitigation for each scheme would be integrated into a Construction Environmental Management Plan, or similar, to be adhered to during construction, as part of the scheme's environmental responsibilities and commitments.

318. The IAQM construction guidance (IAQM, 2016) states that, with the implementation of the recommended mitigation, effects will be not significant. As such and given the above points, potential cumulative effects associated with construction phase dust emissions are likely to be **not significant** in terms of the EIA regulations.

319. Notwithstanding the above, the dust emission magnitude for all potential activity was found to be 'Large' i.e. the maximum level. This level of magnitude is deemed adequate for mitigating potential cumulative impacts from surrounding developments, in the event they are not appropriately mitigated.

19.9.2 Road traffic emissions generated from vehicle movements

320. The road traffic emissions assessment has been conducted in accordance with relevant guidance.

321. Due consideration has been given to emissions generated by relevant projects and plans where necessary. As such, the assessment presented in Section 19.8 is inherently cumulative.

19.9.2.1 Construction

322. In consideration of the likely changes in road traffic flows that may occur on the local highway network as a result of the Project, consideration has been given to the potential maximum traffic flows that could occur in the future assessment year (i.e., 2027) – insofar as possible (based upon information currently available).

323. The traffic flows used in the assessment include vehicle movements associated with relevant committed developments and live projects/plans in the assessment area – insofar as possible (based upon information currently available). This is based on analysis undertaken in Volume 1, Chapter 27: Traffic and Transport (document reference 6.1.27).

324. These vehicle movements have been considered within the screening and dispersion modelling assessments, where necessary (see Section 19.7.1.2 for further details). Consideration of these schemes assumes they become fully operable at the point of assessment.

325. At the time of the assessment and from review of the SHDC planning portal[6], no Transport Statement or details of traffic movements associated with the Naylor Farms development were available and this was therefore not included in the assessment.

[6] SHDC planning portal reviewed on 31/01/2024.

326. Furthermore, where dispersion modelling has been conducted, regulated non-road emissions (e.g. from combustion processes) associated with developments listed in Table 19.20 have also been considered to replicate future air quality conditions and impacts. This is limited to emissions associated with BAEF. Further detail is provided in Appendix 19.4: Road Traffic Dispersion Modelling.

327. Outputs presented within the BAEF Air Quality ES Chapter and technical appendices have been used to facilitate the assessment. Emissions from BAEF have only been considered with respect to human receptors. Based on a review of application documentation, BAEF emissions will not interact with any of the ecological designations considered within the road traffic modelling assessment. No further assessment is necessary.

328. As such, the road traffic emissions assessment outcomes presented in Section 19.8 are inherently cumulative in nature. Given the conclusions of the assessment, the cumulative effect of the Project is considered to be **not significant** in terms of the EIA regulations.

19.9.2.2 Operation and Maintenance

329. Consistent with The Planning Inspectorate's (The Planning Inspectorate, 2022) recommendation, road traffic flows generated by operational activities have been compared against criteria outlined within the EPUK & IAQM guidance document. Operational road traffic flows screen below the EPUK & IAQM criteria and effects are considered to be **not significant** in terms of the EIA Regulations and no further assessment is required.

330. Consistent with applied guidance prescribed by the EPUK & IAQM, screening of projected road traffic vehicle movements has been undertaken in isolation and associated effects are considered insignificant. No further assessment in relation to cumulative effects is therefore required.

331. Notwithstanding, operational phase impacts are not likely to exceed the construction phase for which a full cumulative assessment was undertaken and concluded that there are no significant effects.

332. Cumulative effects associated with operational road traffic flows are considered **not significant** in terms of the EIA regulations.

19.9.3 Emissions generated from construction NRMM

333. Based on the outcomes of the NRMM qualitative assessment, effects are considered to be not significant in terms of the EIA Regulations, following the application of suitable controls and site management. These measures are prescribed within LAQM.TG22 (Defra, 2022) and represent standard practice.

334. These measures are provided in the CoCP, as embedded measure (Table 19.12). This secures their effective application. Effects are considered to be not significant.

335. Considering the 50m distance threshold used to define the NRMM study area (Section 19.4.1), construction sites up to 100m away from the Order Limits could contribute to a potential cumulative effect, where extensive NRMM is proposed. This would likely represent long-term extensive construction schemes. There is very low likelihood of NRMM activities from

other developments to simultaneously overlap within 50m of a sensitive receptor at any one time, given the spatial and temporal profile of onshore construction works.

336. The Naylor Farms development is the only development listed within Table 19.20 which is found within 100m of the Order Limits. It is the only development where cumulative NRMM effects may arise. However, a cumulative effect will only arise if the Naylor Farms development will operate NRMM during the Project's construction phase window. This is unlikely.

337. Construction activities will be temporary/mobile, and plant will not be fixed for the full duration of works. By way of example, construction activities along the onshore ECC construction area will spatially vary as construction progresses. Exposure to NRMM emissions (in the majority of cases) will be transient.

338. In the event that construction activities did overlap, exposure would be temporary and not cause a long-term persistent deterioration of conditions. Therefore, there is low potential for cumulative effects to arise.

339. Despite the above, construction sites within close proximity of the Project will be expected to implement measures/controls to minimise impacts, in fulfilment of their own environmental responsibilities and commitments.

340. The measures prescribed within LAQM.TG22 represent standard practice which construction contractors will be able to meet. In most cases, construction sites will go beyond these controls. These controls are expected to be employed on all construction sites and integrated into a CoCP or similar, to be adhered to during construction. Further, construction is expected to occur from 2027, where cleaner fuels/technology may be available.

341. LAQM.TG22 guidance states that, with the implementation of these controls, effects will be not significant. As such, it is not anticipated that there would be significant cumulative effects associated with construction phase NRMM emissions.

342. In consideration of the above, potential cumulative effects associated with NRMM emissions are considered to be **not significant** in terms of the EIA regulations.

19.9.4 Emissions generated from offshore vessel movements

343. A 1km distance threshold has been used for the purposes of defining the onshore vessel emissions study area from landfall (Section 19.4.1). This threshold is based on the maximum exposure limits provided within LAQM.TG22 (Defra, 2022) used for the assessment of large ships. This is conservative.

344. Developments that will generate large vessel movements within 2km of landfall during construction have the potential to cause cumulative effects.

345. From review of the other development listed in Table 19.20, only the BAEF development is predicted to generate offshore vessel movements. However, the BAEF development will not generate vessel movements within 2km of landfall.

346. On this basis, cumulative effects from emissions generated from offshore vessel movements are not possible or would otherwise be considered **not significant** in terms of the EIA regulations.

19.9.5 Cumulative assessment with the NGSS

347. In relation to the NGSS, cumulative effects associated with construction dust/PM_{10}, road traffic emissions and NRMM emissions during the construction phase are discussed in turn.

19.9.5.1 Dust/PM_{10} emissions generated from construction works

348. In recognition of the applied IAQM screening distances for the construction dust assessment, there are no high sensitivity human receptors within 350m and no ecological receptors within 50m of both the Project and the NGSS Connection Area. As such, there is no potential for cumulative effects with construction activities of the NGSS (i.e. likely to be earthworks and construction activities).

349. However, in recognition of the IAQM assessed activities and given that the NGSS trackout routes are unknown, there is potential for cumulative effects from construction dust emissions generated during trackout activities. From review of the Project study area, this could potentially impact a small number of human receptor locations and one LWS.

350. However, similar to the Project, the NGSS scheme would be required to consider potential construction dust impacts and apply best practice mitigation to effectively control dust emissions. Mitigation would be integrated into a Construction Environmental Management Plan, or similar, to be adhered to during construction, as part of environmental responsibilities and commitments.

351. The IAQM construction guidance (IAQM, 2016) states that, with the implementation of the recommended mitigation, effects will be not significant. As such, potential cumulative effects associated with construction phase dust emissions are likely to be **not significant** in terms of the EIA regulations.

19.9.5.2 Road traffic emissions generated from vehicle movements

352. At this stage, road traffic volumes associated with the NGSS have not been disclosed and therefore a quantitative cumulative assessment with the Project has not been undertaken. Reasonable assumptions have been made to allow for a qualitative assessment to be undertaken.

Construction

353. In relation to the construction phase, it has been assumed that vehicle movements associated with the construction of the NGSS would be similar to the Project OnSS forecast of construction vehicle movements and would utilise the same routes.

354. The assessed road links anticipated to be impacted by construction traffic from both the Project and the NGSS are: A17 (south of River Welland), A17 (north of River Welland), A17 (between A16 and A1121), A17 (west of A1221), and A16 (south of A17).

355. A review of these road links in relation to human and ecological receptors has been undertaken.

356. Of the modelled human receptors located adjacent to the above road links, the maximum predicted annual mean concentrations for the 2027 DS scenario (which includes contributions

from the Project and cumulative projects or plans) are presented as follows:

- NO_2 – a maximum annual mean concentration of 16.9µg/m^3 (42.3% of the AQAL) at Receptor R81.
- PM_{10} – a maximum annual mean concentration of 21.6µg/m^3 (54% of the AQAL) at Receptor R164.
- $PM_{2.5}$ – a maximum annual mean concentration of 11.6µg/m^3 (58% of the AQAL) at Receptor R164.

357. In review of the above, a large headroom exists between the predicted annual mean concentrations and the AQALs. Furthermore, the change in concentration due to the Project relative to the AQALs (i.e. the change between DS and DM) would not alter as a result of additional cumulative flows associated with the NGSS, as these form part of both the DM and DS scenarios. Given these factors and from review of the EPUK & IAQM matrix (Table 19.13), it is considered that all impacts at human receptors would still be negligible, as per the main assessment. Associated cumulative effects from construction road traffic emissions on human receptors, with inclusion of the NGSS, would therefore be considered 'not significant'.

358. In relation to the assessment of ecological receptors, a review of the road links and designated ecological sites within 200m of these, and therefore potentially impacted by cumulative traffic movements from the NGSS, has been undertaken. Each link is discussed in turn:

- A17 (south of River Welland) – two designated LWS are present within 200m. These are Moulton River (ER30), and South Bank Fosdyke (ER37). Neither site was screened into the detailed impact assessment, as presented in Table 19.18. From review of the traffic flows in Table 19.18, it is considered unlikely that any additional construction traffic flows from the NGSS would change this position.
- A17 (north of River Welland) – one designated LWS is present within 200m. This is South Bank Fosdyke (ER37). As mentioned above, the site did not screen into the detailed impact assessment, as presented in Table 19.18. From review of the traffic flows in Table 19.18, it is considered unlikely that any additional construction traffic flows from the NGSS would change this position.
- A17 (between A16 and A1121) – one designated LWS is present within 200m. This is South Forty Foot Drain (ER38). The site did not screen into the detailed impact assessment, as presented in Table 19.18. From review of the traffic flows in Table 19.18, it is considered unlikely that any additional construction traffic flows from the NGSS on the A17 (between A16 and A1121) would change this position.
- A17 (west of A1221) – one designated LWS is present within 200m. This is South Forty Foot Drain (ER38). The site did not screen into the detailed impact assessment, as presented in Table 19.18. From review of the traffic flows in Table 19.18, the in-combination HDV flows are near to the 200 AADT threshold where a detailed assessment would be required. It is therefore possible that the addition of construction traffic flows from the NGSS on the A17 (west of A1221) would result in the requirement for a detailed assessment of ER38. However,

this would be very dependent on the number and distribution of the traffic flows, which is presently unknown.

- A16 (south of A17) – five designated LWS are present within 200m. These are the A16 Verges North of the River Glen (ER10), Pinchbeck Marsh (ER31), Risegate Eau (ER33), River Glen Corridor (ER34), and Vernatt's Drain (ER43). As presented in Table 19.18, all five of the LWS screened into the detailed impact assessment, and therefore this position would not change as a result of additional construction traffic flows from the NGSS on the A16 (south of A17). Following the detailed impact assessment, the effects of road traffic emissions on these designated ecological sites were considered not significant. It is considered unlikely that the additional construction traffic flows from the NGSS would change this.

Operation and Maintenance

359. As presented in Section 19.9.2.2, cumulative effects associated with operational traffic flows from the Project and other relevant projects and plans (not including NGSS) are determined as not significant.

360. Similar to the Project, it is anticipated that operational traffic movements associated with the NGSS would be low, e.g. associated with occasional maintenance visits. As such, the associated effects are likely to be considered insignificant, and the conclusions of Section 19.9.2.2 would remain unchanged i.e. cumulative effects associated with operational road traffic flows are considered **not significant** in terms of the EIA regulations.

19.9.5.3 Emissions generated from construction NRMM

361. In relation to the applied 50m distance screening threshold for cumulative impacts from NRMM emissions, a sensitive receptor would need to be within 50m of both the Project and NGSS construction areas. From review of the area of overlap between the study areas, there are no ecological receptors and no high sensitivity human receptors.

362. The potential for cumulative effects associated with the Project and the NGSS is therefore low. Furthermore, it is expected that both schemes would implement control measures to minimise impacts from NRMM emissions – such as those identified in the Outline Air Quality Management Plan (Document 8.1.2) for the Project.

363. As such, potential cumulative effects associated with NRMM emissions are considered to be **not significant** in terms of the EIA regulations.

19.10 Inter-Relationships

364. An assessment of inter-relationships considers whether the impacts identified and assessed in this chapter, and also impacts from other chapters, have the potential to interact with each other. Inter-related effects consider impacts from the construction, operation or decommissioning of the Project on the same receptor (or group).

365. Such inter-related effects include both:

- Project lifetime effects: i.e., those arising throughout more than one phase of the project (construction, operation, and decommissioning) to interact to potentially create a more significant effect on a receptor than if just one phase were assessed in isolation; and

- Receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor (or group). Receptor-led effects might be short term, temporary or transient effects, or incorporate longer term effects.

366. In relation to project lifetime effects, the air quality effects established as part of this assessment are discrete to a certain phase of the Project and are temporary i.e. not presenting a long-term deterioration of conditions. The potential for interactions between these effects is therefore unlikely.

367. For receptor led effects, it is acknowledged that noise, visual, and air quality effects could overlap at a sensitive human receptor location. Furthermore, ecological designations could experience noise and air quality effects in-combination, for example.

368. However, given that all air quality effects established as part of this assessment are considered to be **not significant** in terms of the EIA regulations, the likelihood of inter-related effects occurring as a result of air quality is low. No further assessment is therefore required.

19.11 Transboundary Effects

369. Air quality impacts and effects will be localised; restricted to the onshore areas where activities are occurring and not experienced across international boundaries. Further assessment of transboundary effects has therefore been scoped out of the assessment. This approach was agreed by The Planning Inspectorate in the Scoping Opinion (The Planning Inspectorate, 2022).

19.12 Conclusions

370. This assessment has considered the potential air quality effects on onshore receptors arising from activities associated with the Project. Consideration has been given to the MDS and worst-case parameters have been adopted to provide a robust assessment.

371. The scope of the assessment has been informed by both national and local planning policy and guidance, established best practice and experience, as well as via the consultation process with relevant consultees. This includes the Scoping Opinion received from The Planning Inspectorate (The Planning Inspectorate, 2022), and feedback received during the EPP and Section 42 consultation. The summary of effects is summarised in Table 19.22.

19.12.1 Construction

372. The assessments of dust/PM_{10}, NRMM, and offshore vessel emissions generated during the construction phase of the Project concluded that effects are **not significant** at sensitive human and ecological receptors in line with EIA regulations.

373. Embedded mitigation measures for dust/PM_{10} and NRMM have been identified in Document 8.1.2: Outline Air Quality Management Plan for inclusion within the Outline CoCP.

374. Impacts associated with temporary increases in road traffic flows on the local road network as a result of the construction phase of the Project have been assessed at sensitive human and ecological receptors. An initial screening assessment determined the extent of the affected road network and receptors for inclusion within the dispersion modelling assessment.

375. It is concluded that effects associated with road traffic emissions generated by Project construction activities on human and ecological receptors are **not significant** in terms of the EIA regulations. Road traffic flows associated with committed developments and live projects and plans are considered in the assessment, which is therefore cumulative in nature. Furthermore, onshore construction works are expected to last up to 51-months and as such, any consequential impacts onto local road traffic flows are believed to be temporary, with no long-term deterioration of conditions.

19.12.2 Operations and Maintenance

376. Operational road traffic impacts were screened out from requiring further assessment based on the anticipated road traffic flows being below the EPUK & IAQM screening criteria.

19.12.3 Decommissioning

377. Decommissioning activities are not anticipated to exceed the construction phase worst-case criteria assessed; whereby all effects assessed are concluded as being not significant. Further assessment in relation to the decommissioning phase is therefore not required as effects are believed to be **not significant**.

19.12.4 Cumulative Impact Assessment

378. A cumulative impact assessment has been undertaken to consider potential cumulative effects of the Project in combination with other committed developments and live projects/plans in the assessment area.

379. Potential cumulative effects associated with construction phase dust/PM_{10}, road traffic, NRMM, and offshore vessel emissions are considered to be **not significant** in terms of the EIA regulations.

380. Furthermore, during the operational phase, cumulative effects associated with road traffic flows are considered **not significant** in terms of the EIA regulations.

Table 19.22 Summary of Potential Impacts on Onshore Air Quality

Description of effect	Effect	Additional mitigation measures	Residual impact
Construction			
Dust/PM_{10} emissions generated from temporary onshore construction works	Negligible **(not significant)**	No additional mitigation identified.	Negligible **(not significant)**
Road traffic emissions generated from temporary construction vehicle movements – human receptors	Negligible **(not significant)**	No additional mitigation identified.	Negligible **(not significant)**
Road traffic emissions generated from temporary construction vehicle	Negligible **(not significant)**	No additional mitigation identified.	Negligible **(not significant)**

Description of effect	Effect	Additional mitigation measures	Residual impact
movements – ecological receptors			
Emissions generated from temporary construction NRMM	Negligible **(not significant)**	No additional mitigation identified.	Negligible **(not significant)**
Emissions generated from temporary offshore construction vessel movements	Negligible **(not significant)**	No additional mitigation identified.	Negligible **(not significant)**
Operation and Maintenance			
Operational phase traffic movements	Negligible **(not significant)**	Not required	Negligible **(not significant)**
Decommissioning			
Likely air quality impacts associated with decommissioning phase traffic movements and other works	Impacts and effects comparable to the construction phase, or likely lesser given the forecast improvements to air quality and the potential for the cables to remain in situ.		
Cumulative			
Cumulative dust/PM_{10} emissions generated from temporary onshore construction works	Negligible **(not significant)**	No additional mitigation identified.	Negligible **(not significant)**
Cumulative road traffic emissions generated from temporary construction vehicle movements – human receptors	Negligible **(not significant)**	No additional mitigation identified.	Negligible **(not significant)**
Cumulative road traffic emissions generated from temporary construction vehicle movements (without NGSS) – ecological receptors	Negligible **(not significant)**	No additional mitigation identified.	Negligible **(not significant)**
Cumulative emissions generated from temporary construction NRMM	Negligible **(not significant)**	No additional mitigation identified.	Negligible (**not significant**)
Cumulative emissions generated from temporary offshore vessel movements	Negligible **(not significant)**	No additional mitigation identified.	Negligible **(not significant)**

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