



FIVE
ESTUARIES
OFFSHORE WIND FARM

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OFFSHORE WIND FARM
VOLUME 6, PART 6, ANNEX 10.2: NON
ROAD MOBILE MACHINERY EMISSIONS
ASSESSMENT

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Five Estuaries Offshore Wind Farm

Environmental Statement

**Annex 10.2 of Volume 6, Part 3, Chapter 10: NRMM
Emissions Assessment**

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Basis of Report

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Acronyms and Abbreviations

Team	Definition
AQAL	Air Quality Assessment Levels
CoCP	Code of Construction Practice
DCO	Development Consent Order
Defra	Department for Environment Food and Rural Affairs
DPFs	Diesel Particulate Filters
ECC	Export Cable Corridor
ETG	Expert Topic Group
HDD	Horizontal Directional Drilling
HVAC	High Voltage Alternating Current
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LAQM.TG(22)	Local Air Quality Management Technical Guidance 2022
LNR	Local Nature Reserve
LoWS	Local Wildlife Site
NO _x	Oxides of Nitrogen
NO ₂	Nitrogen Dioxide
NSIP	Nationally Significant Infrastructure Project
NRMM	Non-Road Mobile Machinery
NWP	Numerical Weather Prediction
O&M	Operation and Maintenance
OnSS	Onshore Substation
PAWS	Plantations on Ancient Woodland Site
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PM _{2.5}	Fine Particulate Matter
PM ₁₀	Particulate Matter
SI	Statutory Instrument
SSSI	Site of Special Scientific Interest
TCC	Temporary Construction Compounds
TDC	Tendring District Council
TJB	Transition Joint Bay
VE	Five Estuaries Offshore Wind Farm
VE OWFL	Five Estuaries Offshore Wind Farm Limited



1.0 NRMM Emissions Assessment

The scope of the assessment is to understand potential air quality impacts associated with emissions generated by Non-Road Mobile Machinery (NRMM) during both the construction and operation and maintenance (O&M) phases of Five Estuaries Offshore Wind Farm (VE). This is in response to comments from Planning Inspectorate (PINS) contained within the Scoping Opinion. Further, decommissioning impacts have also been considered for completeness.

The assessment scope is principally based on understanding construction impacts; the likelihood for air quality impacts to arise throughout the lifecycle of VE are higher during the construction phase – as it represents worst-case air quality conditions for assessment. This is attributed to the anticipated enhancement in air quality conditions over the VE lifecycle, coupled with the expectation of increased construction activities compared to operational and decommissioning phases (if cables are left *in situ*). Construction phase impacts have been used as an appropriate benchmark to identify potential O&M and decommissioning impacts.

1.1 Background

According to the Institute of Air Quality Management (IAQM) construction guidance (IAQM, 2023), experience of assessing exhaust emissions from NRMM suggests that they are unlikely to make a significant impact on local air quality.

Furthermore, in accordance with Department for Environment Food and Rural Affairs' (Defra's) Local Air Quality Management (LAQM) Technical Guidance 2022 (TG.22) (LAQM.TG22) (Defra, 2022), providing suitable controls are applied, emissions generated from NRMM are unlikely to contribute to a significant impact upon local air quality. These controls represent standard practice and were included within the Scoping Report.

Consistent with advice provided by the IAQM and Defra, it was initially proposed to scope out impacts associated with emissions generated from NRMM used within the construction phase on the basis that suitable controls will be applied.

In the Scoping Opinion (PINS, 2021), PINS indicated that following the implementation of appropriate controls/ measures it is possible that significant effects from emissions generated by NRMM in the construction phase would be avoided. However, PINS believed there was insufficient information to fully validate this opinion. Furthermore, PINS suggested that there was insufficient information to scope out effects associated with potential emissions generated from NRMM used during the O&M phase. PINS therefore recommended to either undertake an assessment of each phase or provide evidence demonstrating agreement with the relevant consultation bodies and the absence of likely significant effect occurring.

Essex County Council (representing Tendring District Council (TDC)), within its consultation response contained within the Scoping Opinion agreed NRMM emissions could be scoped out following the implementation and enforcement of suitable mitigation measures – consistent with the approach adopted by Defra. Natural England raised no comment with regards to scoping out impacts associated with emissions generated from NRMM within their Scoping Opinion consultation response.



Based on the above consultation outcomes, it can be concluded that relevant consultation bodies are in agreement that NRMM can be scoped out from assessment, providing suitable controls are applied.

In recognition of this, a series of construction phase control measures have been included within Volume 9, Report 9.21: Code of Construction Practice (CoCP) to minimise NRMM emissions. These controls are based on LAQM.TG(22).

The CoCP also includes a voluntary commitment for all NRMM to comply with Stage V emission standards as a minimum. This goes beyond the LAQM.TG(22) standard suite of controls – ensuring impacts are avoided where possible.

Implementation of the CoCP will be secured as a requirement of the Development Consent Order (DCO). Therefore, in accordance with Defra and IAQM guidance, impacts associated with construction phase generated NRMM emissions are not likely to be significant.

Notwithstanding this, a qualitative assessment of construction NRMM emissions has been undertaken – in recognition of PINS request. This also comprises a discussion regarding O&M and decommissioning activity, to determine whether further assessment is required, with reference to the construction assessment outcomes.

This assessment was conducted for the Preliminary Environmental Information Report (PEIR) (Five Estuaries Offshore Wind Farm Limited (VE OWFL), 2023). No comments or recommendations were made in response to the proposed approach, and it is considered suitable. Furthermore, no comments were raised by TDC or Natural England during the Air Quality Expert Topic Group (ETG) process (to date) regarding NRMM emissions.

Notwithstanding the above, a qualitative assessment of NRMM emissions has been undertaken to inform the likelihood of a significant effect arising in order to be proactive and robust. The qualitative approach to the NRMM assessment has been consulted through the VE Air Quality ETG process.

1.2 Assessment Methodology

With reference to LAQM.TG(22) (Defra, 2022), the qualitative construction NRMM assessment has considered:

- Duration of works and associated phasing plans;
- The type and number of NRMM to be used (including the emissions standards to which the NRMM comply);
- Operating hours of NRMM;
- Proximity of sensitive receptors to NRMM working areas; and
- Existing air quality conditions in the area (local monitoring and/ or Defra background pollutant concentration maps).

The outcomes of this assessment have been used as an appropriate benchmark to identify potential operational and decommissioning impacts.

Following a review of approaches adopted for other Nationally Significant Infrastructure Projects (NSIPs) where extensive onshore construction activities are proposed, a 50 m distance screening threshold in relation to NRMM emissions has been accepted by statutory consultees and PINS (England) (Northampton Gateway, 2019). Following submission and



with use of this distance screening threshold, the DCO for the Northampton Gateway Rail Freight Interchange was awarded by the Secretary of State in 2019 (Statutory Instrument (SI) 2019/1358, 2019). Use of 50 m for screening impacts from NRMM emissions is considered appropriate. The basis for this distance screening threshold relates to guidance provided in LAQM.TG(22), used for the purposes of establishing background monitoring stations to ensure there is no additional influence of local pollution sources:

“For urban background or suburban sites there should be no major sources of pollution (for example a large multi-storey car park) within 50 m. There should be no medium sized emission sources (for example, petrol stations, boiler vents, or ventilation outlets for catering establishments) within 20 m.”

Notwithstanding the above, the 50 m distance threshold relates to major sources of pollution. NRMM emissions generated by construction activity is not considered to be comparable to major sources of pollution (for example a large multi-storey car park). Furthermore, in consideration of likely construction activities, the extent of NRMM used throughout all stages of VE is likely to be lower than those used to facilitate the construction of the Northampton Gateway Rail Freight Interchange. Construction activities for VE will also occur in temporary and mobile manner (e.g. across the full spatial extent of the onshore Export Cable Corridor (ECC)). Exposure to emission contributions will therefore be transient. Whereas for the Northampton Gateway Rail Freight Interchange, construction activities will be confined to a smaller boundary – where exposure to emissions is likely to be constant. Use of 50 m to screen impacts from NRMM is considered to be overly precautionary.

A 50 m distance screening threshold in relation to NRMM emissions has been applied to the Order Limits initially to inform the spatial extent of affected receptors (human and ecological). Use of the Order Limits for the purposes of informing the extent of NRMM emissions is conservative – as it relates to the maximum design parameters/ extents of any proposed construction area, however, ensures all potential scenarios and associated impacts have been assessed. Furthermore, the Order Limits includes operational access routes that follow existing tracks. Use of the Order Limits increases the extent of assessed interactions, however, ensures throughout VE lifecycle are understood. In addition, it assumes that all NRMM will be operated at the extents of the Order Limits, which is highly unlikely to be the case, as NRMM locations will vary across the active construction area and will not typically be operated continuously at the boundary.

Use of the Order Limits in this context is likely to facilitate a conservative assessment, and therefore increases the opportunity for interactions with sensitive receptors. As per Volume 9, Report 9.21: CoCP, site machinery will be positioned to maximise the separation distance(s) to sensitive receptors, as far as practically possible.

1.3 Construction Phase Assessment

1.3.1 Baseline Air Quality Conditions

This section presents baseline air quality conditions with respect to the construction phase.

1.3.1.1 Defra Mapped Background Pollutant Concentrations

Defra maintains a nationwide model of existing and future background air quality concentrations at a 1 km grid square resolution (Defra, 2020). The datasets include annual



average concentration estimates for the following pollutants using a reference year of 2018 (the year in which comparisons between modelled and monitoring are made):

- Oxides of nitrogen (NO_x);
- Nitrogen dioxide (NO₂);
- Particulate matter (PM₁₀); and
- Fine particulate matter (PM_{2.5}).

Consideration has been given to pollutant concentrations reported for the first year of proposed activities associated with VE (2027 – the earliest potential year onshore construction will commence). Use of 2027 datasets to characterise baseline pollutant concentrations for the whole lifespan of VE is conservative, in recognition of the forecast improvements to air quality (associated with the introduction of policy and cleaner emission technologies/ restrictions).

Baseline concentrations anticipated throughout the whole life cycle of VE (beyond 2027) are expected to be lower in comparison to those reported. Further, this assumes that all NRMM activity will occur under worst-case air quality conditions (projected to occur across the whole lifespan of VE).

The maximum mapped background concentrations from the 1 km grid squares covering the Order Limits are presented in Table A. The corresponding annual mean Air Quality Assessment Levels (AQALs) and/ or Critical Levels (where available) are provided for comparison.

Table A: Maximum Defra Mapped Background Pollutant Concentration Estimates

Year	Maximum Annual Mean Background Concentration (µg/m ³)			
	NO _x	NO ₂	PM ₁₀	PM _{2.5}
2027	8.8	6.8	15.5	8.8
AQAL/ Critical Level	30	40	40	20

The maximum background concentrations presented in Table A are well-below the relevant respective annual mean human health AQALs or ecology Critical Level.

The NRMM study area is not considered to be sensitive to air quality.

1.3.1.2 Local Monitoring

A review of monitoring conducted across the NRMM study area by local and central government agencies has been undertaken as detailed in Volume 6, Part 3, Chapter 10: Air Quality.

NO₂ diffusion tube monitoring is undertaken by TDC within the NRMM study area (TDC, 2020). Diffusion Tube DT20 is located roadside of the A120 adjacent to the extent of the Order Limits. The A120 is an arterial trunk road, anticipated to experience higher vehicle volumes than other roads that are located within the NRMM study area. NO₂ annual mean concentrations recorded at this location will represent localised vehicle emission contributions.



Use of NO₂ annual mean concentrations recorded at this location for the purposes of characterising baseline conditions across is considered to be conservative and may exaggerate conditions.

Monitoring results are detailed in Table B.

Table B: Results from Local Non-Automatic Monitoring Locations

Site ID	2019 Data Capture	Annual Mean Concentration (µg/m ³)				
		2015	2016	2017	2018	2019
DT20	100	21.0	21.9	24.2	20.3	20.7

The annual mean NO₂ concentration at DT20 was ‘well-below’ the annual mean AQAL for all years assessed.

The NRMM study area is not considered to be sensitive to air quality.

1.3.1.3 Meteorological Data

Local numerical weather prediction (NWP) meteorological data has been used to identify localised meteorological conditions across the NRMM study area, and prevailing dispersion characteristics. The same data has been used in the dispersion modelling exercise.

The processed NWP meteorological data (centred on the Order Limits) was provided by an accredited 3rd party vendor.

A wind rose of the 2019 NWP data is presented in Figure A below.

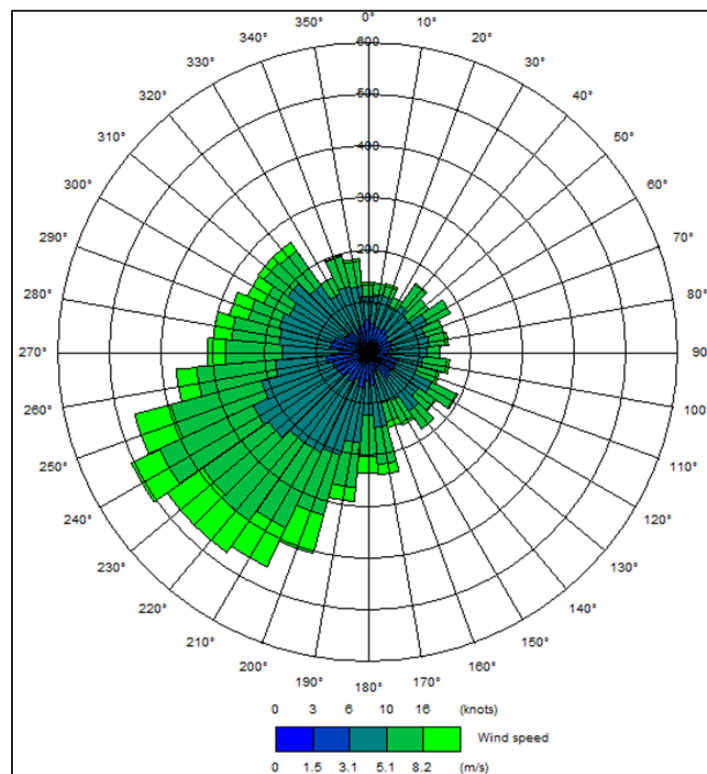


Figure A: Wind Rose for NWP Meteorological Data 2019



Winds are predominantly from the south-west. Receptor locations to the north and east of potential NRMM activity are therefore more likely to be impacted by emissions, as they will be located downwind of the source.

1.3.2 NRMM Emissions Regulation

NRMM emissions are controlled through European Directives (e.g. Regulation EU 2016/1628) in terms of maximum operable emission limits. Emissions standards are applied to NRMM engines at the point of placing on the market and typically become stricter following the introduction and availability of cleaner technologies and fuels. The most recent stringent emission standards, Stage V, were effective from 2019 for engines below 56 kW and above 130 kW, and from 2020 for engines of 56-130 kW.

The CoCP (Volume 9, Report 9.21) includes a voluntary commitment for all NRMM to comply with Stage V emission standards as a minimum. This is the latest emission standard currently available.

1.3.3 Construction Details

1.3.3.1 Working Hours

Construction working hours are to be agreed with the Local Authority, with necessary permit/authorisations required for the construction work to commence.

Typically, construction activities will be daytime only; 07:00 to 19:00 Monday to Saturday, with no work beyond the site boundary on Sundays, Bank Holidays or in the night-time without prior agreement.

Certain 'time critical/ continuous activities' (major Horizontal Directional Drilling (HDD) works) would occur outside these hours. Any requirement to work outside of these normal hours would only occur with prior agreement from the Local Authorities.

1.3.3.2 Construction Timescales

The earliest potential year construction of VE will commence is 2027.

Onshore construction activities will be split into discrete campaigns and be conducted in a phased and gradual manner. Works will vary along the spatial extent of the Order Limits, according to specific works.

The onshore construction of VE will comprise of three discrete campaigns:

- Landfall connection (6 months);
- High Voltage Alternating Current (HVAC) export cable installation (18 months); and
- Onshore substation (OnSS) construction (24 months).

The nature of work will differ across these three elements. The construction campaigns will span between 6 to 24 months and are therefore considered short-term.

For further information on the construction campaigns, see Volume 6, Part 3, Chapter 1: Onshore Project Description.



1.3.3.3 The Number and Type of NRMM to be Used

Table C to Table K details the maximum number of NRMM proposed to be operable at any point during the different construction activities.

Construction activities have been grouped to represent the full lifecycle of a specific activity (e.g. Transition Joint Bay (TJB): grouping of excavation, wall and base construction, connection of cables within the TJB, roof and backfill).

The maximum estimated percentage (%) for each type of NRMM operable during the activity lifecycle has also been presented.

Whilst specific NRMM equipment may be operated continuously (up to 100 %), construction activities will be temporary/ mobile. By way of example, construction activities along the onshore ECC construction area will move as construction progresses. Exposure to NRMM emissions (in the majority of cases) will be transient.

Table C: NRMM: Establish Access and Temporary Construction Compound (TCC) and/ or HDD Compound. Removal of Access and/ or HDD Compound

Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
D6 dozer	2	100
30T excavator	2	100
20T dumper	3	100
Smooth drum vibro road roller	1	100
21T excavator	1	100
5T forward tipping dumper	1	100
Loading shovel (not required for HDD compound establishment)	2	100
Tractor & fencing kit	1	100
Tractor & trailer	1	70
Tractor & fuel bowser (or self-propelled)	1	10
Tractor & water bowser (for dust suppression)	1	25
Grader	1	100
Telehandler	1	70
Mobile self-contained welfare unit	2	25
Mobile generator	2	25
Temporary lighting	6	25
Road surface paver & roller (not required for HDD compounds)	1	25
Tractor & soil tiller, roller, seeder	1	25



Table D: NRMM: Site Preparation, Including Fencing, Haul Road Construction and Topsoil Strip. Haul Road Removal and Removal of fencing and Reinstatement

Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
D6 dozer	1	100
30T excavator	2	100
20T dumper	3	100
Smooth drum vibro road roller	2	100
21T excavator	1	100
5T forward tipping dumper	1	100
Loading shovel (not required for HDD compound establishment)	1	100
Tractor & fencing kit	2	100
Tractor & trailer	1	70
Tractor & fuel bowser (or self-propelled)	1	50
Tractor & water bowser (for dust suppression)	1	25
Grader	1	100
Telehandler	1	70
Mobile self-contained welfare unit	2	25
Mobile generator	2	25
Temporary lighting	12	25

Table E: NRMM: Landfall Beach Operations and HDD Exit Pit

Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
21T excavator	1	10
Cable winch	1	10
Percussive piling rig (if cofferdam approach used)	1	70
Pump	2	25
Temporary lighting	4	50

Table F: NRMM: TJB

Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
D6 dozer	1	100



Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
30T excavator	1	100
20T dumper	2	100
Smooth drum vibro roller	1	10
21T excavator	1	50
5T forward tipping dumper	1	50
Tractor & fuel bowser (or self-propelled)	1	10
Tractor & water bowser (for dust suppression)	1	25
Mobile self-contained welfare unit	1	25
Mobile generator	2	25
Temporary lighting	4	25
Pump	2	100
Tractor & trailer	1	50
Mobile concrete pump/ concrete mixer truck	1	50
Telehandler	1	50
Mobile crane	1	25
Cable laying tracked crane	1	25
Crawler crane	1	25
Loading shovel	1	100
Trench roller	1	75
Cement mixer	1	25
Pre-cast concrete truck	1	5

Table G: NRMM: Trench Bays and Jointing Bays

Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
D6 dozer	2	100
30T excavator	2	100
20T dumper	2	100
Smooth drum vibro roller	1	100
21T excavator	2	100
5T forward tipping dumper	2	100
Tractor & fuel bowser (or self-propelled)	1	10



Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
Tractor & water bowser (for dust suppression)	1	25
Mobile self-contained welfare unit	1	25
Mobile generator	2	25
Temporary lighting	8	25
Pump	2	100
Tractor & trailer	1	50
Mobile concrete pump/ concrete mixer truck	1	50
Telehandler	1	50
Mobile crane	1	50
Crawler crane	1	10
Loading shovel	2	100
Trench roller	2	75
Tractor & cable drum trailer	1	50
Cable winch	1	50

Table H: NRMM: HDD Rig Mobilisation and Demobilisation

Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
30T excavator	2	100
20T Dumper	1	100
Generator	1	100
Telehandler	2	75
Vibratory Piling Rig	1	10
Mounting supports for directional drill (hydraulic hammer) - Not applicable for rig demobilisation	1	25
Smooth Drum vibro road roller	1	100
Grader	1	100
Temporary lighting	6	25



Table I: NRMM: HDD Compound Operations (Pilot Drilling and Reaming - Two HDD Rigs)

Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
Generator	2	100
Telehandler	2	75
Vibratory piling rig	0	10
Directional drill generator	2	100
Mounting supports for directional drill (hydraulic hammer)	0	25
Mud pump	2	100
Mixing tank	2	100
Cuttings/ Recycling tank	2	100

Table J: NRMM: TCC Operations

Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
Generator	2	100
Wheel wash	0	10
Telehandler	2	75
Road sweeper	1	10

Table K: NRMM: Unlicensed Works

Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
21T excavator	1	25
5T Forward Tipping Dumper	1	25
Trench Roller	1	10
Mobile crane	1	25
Mobile generator	1	25
Temporary lighting	1	25
Pump	1	25

Table L: NRMM: OnSS Construction

Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
Excavator (earthworks)	6	100



Vehicle/ Equipment	Maximum Indicative Number (No.) at any Point	Maximum Estimated Percentage of Operation During All Activities
Excavator (hydraulic breaker)	4	100
Dozer	4	75
Air compressor	4	100
Dump truck	8	70
Generator	2	100
Crusher	2	80
Large rotary bored piling rig	1	100
Tracked drilling rig with hydraulic drifter	1	100
Crane mounted auger	1	100
Mini piling rig	2	100
Compressor for mini piling	1	100
Truck mixer with pump	2	10
Grinder	5	50
Asphalt spreader with support lorry	1	100
Vibratory roller	2	70
Grader	1	100
Mobile crane	1	50
Lorry	3	25
MEWP	2	75
Forklift truck	2	50
Pneumatic chipper/drill	3	50
Scaffolding	1	25

Review Outcomes

The most frequently used piece of NRMM across all campaigns is temporary lighting. Emissions associated with temporary lighting are considered low risk.

The OnSS construction comprises the greatest number and variety of NRMM resulting in the largest emission magnitude. This includes eight No. dump truck, six no. excavator and five no. grinders. Additionally, construction works at the OnSS extend for the longest duration up to 24 months, in comparison to other campaigns (Section 1.3.3.2). Consequently, the OnSS construction represents the worst-case construction campaign with respect to risk potential. Emission risk potential associated with other construction campaigns are smaller.

In relation to the onshore ECC, construction activities will be temporary/ mobile indicatively lasting up to 18 months (Section 1.3.3.2). They will not be fixed for a prolonged duration and will move as construction progresses. Exposure to NRMM emissions will be transient.

In relation to the construction compounds (TCC and HDD), NRMM will be operational within a fixed area and exposure pathways to surrounding receptors are likely to be constant, thus



presenting the greatest risk. However, the number and variety of NRMM proposed to be used within the construction compounds is considered small in comparison to other activities. The risk potential is low.

1.3.4 Affected Receptors

Volume 6, Part 3, Chapter 10: Air Quality, Figure 10.5 provides an illustration of the NRMM study area, following the application of the 50 m distance threshold from the Order Limits.

This approach assumes that all NRMM will be operated on the boundary of the Order Limits (inclusive of all design options), and therefore increases the opportunity for interactions with sensitive receptors. This is unlikely, as site machinery will be positioned to maximise the separation distance(s) to sensitive receptors, as far as practically possible. This is a measure included within the CoCP (Volume 9, Report 9.21). However, this approach ensures all potential scenarios and associated impacts have been assessed.

A review of onshore sensitive (human and ecological) receptors located within the NRMM study area 50 m of the Order Limits has been undertaken.

1.3.4.1 Human Receptors

Table I details the extent of human receptors located within 50 m of potential NRMM activity generated by VE.

Table M: Details of Affected Human Receptors

Affected Area/ Properties	
Properties on Manor Way	Frinton Golf Club
Properties on Second Avenue	Property off Swan Road
Properties on B1032 Clacton Road	Properties off B1035 Thorpe Road
Properties on Little Clacton Road	Property off Pork Lane
Property on Mill Lane	Properties on B1035 Clacton Road
Property off B1033 Thorpe Road	Property on Bentley Road
Property on Payne's Lane	Properties on Ardleigh Road
Properties on B1414	Property on Hungerdown Lane
Properties on Golden Lane	-

Human receptors are found within the NRMM study area i.e. 50 m of the Order Limits.

Based upon the construction activity analysis outcomes (Section 1.3.3.3), the OnSS construction represents the worst-case construction campaign with respect to risk potential. However, there are no sensitive human receptors located within 50 m of the proposed OnSS works.

There are no human receptors located within 50 m of the proposed major HDD works.

1.3.4.2 Ecological Receptors

Table J details the extent of ecological receptors located within 50 m of potential NRMM activity generated by VE.



Table N: Details of Affected Ecological Receptors

Site Name	Designation	Sensitive Habitat
Holland Haven Marshes	Site of Special Scientific Interest (SSSI)	Vascular Plant Assemblage
	Local Nature Reserve (LNR)	Vascular Plant Assemblage
Simon's Wood	Plantations on Ancient Woodland Site (PAWS)	Mixed Woodland
	Local Wildlife Site (LoWS)	Mixed Woodland
Great Holland Pits	LoWS	Not Sensitive (Open Mosaic Habitat on Previously Developed Land)
Little Bromley Churchyard	LoWS	Lowland Grassland (Neutral)

Sensitive ecological designations are found within the NRMM study area i.e. 50 m of the Order Limits.

Based upon the construction activity analysis outcomes (Section 1.3.3.3), the OnSS construction represents the worst-case construction campaign with respect to risk potential. However, there are no sensitive ecological receptors located within 50 m of the proposed OnSS works.

In relation to landfall operations, potential NRMM activity has the potential to interact with the Holland Haven Marshes SSSI and LNR. These activities are temporary - only predicted to last up to 6 months. As such, exposure to NRMM emissions will be temporary and indiscernible. Furthermore, a large proportion of the landfall construction activities are expected to be below ground level i.e. associated with trenchless techniques. This is likely to minimise any impacts from NRMM emissions.

In relation to the onshore ECC, potential NRMM activity has the potential to interact with the following designations:

- Holland Haven Marshes SSSI and LNR;
- Simon's Wood PAWS and LoWS; and
- Little Bromley Churchyard LoWS.

However, construction activities will be temporary/ mobile indicatively lasting up to 18 months (Section 1.3.3.2). They will not be fixed for a prolonged duration and will move as construction progresses. Exposure to NRMM emissions will be transient.

1.3.5 Controls and Mitigation

A series of construction phase control measures are included within Volume 9, Report 9.21: CoCP to minimise NRMM emissions.

These controls are principally based on LAQM.TG(22) (Defra, 2022) recommended suite of measures. These are replicated here:

- Ensure all vehicles switch off engines when stationary - no idling vehicles;
- Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable;



- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate);
- Ensure all equipment complies with the appropriate NRMM emission standards; and
- Where feasible, ensure further abatement plant is installed on NRMM equipment, e.g. Diesel Particulate Filters (DPFs).

As per LAQM.TG(22), following application of the above controls, impacts associated with NRMM emissions on sensitive receptors are unlikely to be significant.

Building upon the above, relevant measures recommended from the outcomes of the IAQM dust assessment have also been incorporated. These include the following:

- Plan site layout so that machinery is located away from receptors, as far as is possible; and
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.

The CoCP (Volume 9, Report 9.21) also includes a voluntary commitment for all NRMM to comply with Stage V emission standards as a minimum.

These controls extend beyond the standard suite in LAQM.TG(22), aiming to prevent impacts wherever possible. The application of these measures is proactive.

1.3.6 Assessment of Significance of Effect

This section summarises the information presented to determine the likelihood of a significant effect arising from construction NRMM emissions. The following points have been considered:

- Onshore construction activities will be split into discrete campaigns and be conducted in a phased and gradual manner;
- Based upon the review of NRMM operable across the three discrete campaigns, the OnSS is identified as the worst-case construction campaign with respect to risk potential. This is attributed to the number and variety of NRMM proposed and duration of construction (24 months). However, there are no sensitive human or ecological receptors located within 50 m of the proposed OnSS works. Thus, there are no impacts;
- In most cases, construction activities will be temporary/ mobile. By way of example, construction activities along the onshore ECC not be fixed for a prolonged duration and will move as construction progresses. Exposure to NRMM emissions will be transient;
- Where NRMM equipment will be operational within a fixed area (e.g. compounds) and exposure pathways to surrounding receptors are constant, the number and variety of NRMM is considered small in comparison to other campaigns. The risk potential is low;
- The construction period is considered short-term and temporary, lasting up to 18 months in instances where receptors are located within 50 m (excluding the OnSS).



Furthermore, working hours are limited (normal hours are 07:00 to 19:00 Monday to Saturday);

- A series of construction phase control measures are included within Volume 9, Report 9.21: CoCP to minimise NRMM emissions. These measures represent established best practice techniques, prescribed by IAQM (IAQM, 2023) and LAQM.TG22 (Defra, 2022). The CoCP also includes a voluntary commitment for all NRMM to comply with Stage V emission standards as a minimum. Following application of these controls, effects are considered not significant; and
- The NRMM study area is not considered to be sensitive to air quality. Maximum annual mean background concentrations across all potential construction areas are 'well-below' the relevant AQALs or Critical Level. The likelihood of NRMM causing an exceedance (whilst considering the above points) is therefore low.

Given the above, it is considered unlikely that significant effects on onshore sensitive human and ecological receptors will arise due to NRMM emissions generated during the construction phase of VE.

Potential impacts from NRMM emissions would therefore be considered negligible, direct and short-term/temporary, with the resultant effects **not significant** in terms of the EIA regulations.

1.4 Operational Phase Assessment

Onshore operational activities limited to maintenance are expected to be intermittent/infrequent in comparison to the assessed construction activities. To give an indication of the extent of operational activities, planned maintenance to the OnSS would comprise one visit per week, which may increase to daily for a two-week period per year during annual maintenance. In relation to the onshore cable route, planned maintenance may involve one visit to each cable joint pit per year. NRMM may not be required during these maintenance activities.

The extent of NRMM proposed to be used during the operational phase is not expected to be greater in comparison to the construction phase. For these reasons, operational activities are not anticipated to exceed the construction phase worst-case criteria assessed, and impacts are likely to be lesser in comparison. Based on information presented in Section 1.3, effects associated with construction NRMM are not significant in terms of the EIA Regulations.

Furthermore, the controls measures endorsed by LAQM.TG(22) (Defra, 2022) to minimise NRMM emissions will also be employed during the operational phase – as relate to standard practice. Following the application of these control, impacts on local air quality are unlikely.

As such, based on the above information, effects associated with operational NRMM emissions are considered to be **not significant** in terms of the EIA Regulations.

1.5 Decommissioning Phase Assessment

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.



Decommissioning activities are expected to occur for up to three years. Decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed, and impacts are likely to be lesser in comparison, given the following:

- Landfall infrastructure is expected to be left *in situ* where appropriate, to abate potential future impacts and minimise the extent of decommissioning activities and NRMM;
- NRMM emission restrictions are expected to tighten in future years and in the interim before decommissioning activities occur (>25 years). This forecast is based on the introduction and availability of cleaner technologies and fuels, alongside enforcement by legislation. Therefore, emission contributions from NRMM emissions generated during the decommissioning phase are expected to be lower in comparison; and/or
- Air quality is expected to improve in future years (a trend highlighted in Table A), and in the interim before decommissioning activities occur (>25 years). This forecast is based on the introduction of policy and legislation, and the availability of cleaner technologies. The likelihood of a significant effect arising during the decommissioning phase is therefore low.

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 effects from NRMM emissions on human and ecological receptors are not significant. Further assessment in relation to the decommissioning phase is therefore not required.

Effects associated with decommissioning effects are believed to be **not significant** in terms of the EIA Regulations.

Nonetheless, the decommissioning methodology would be finalised nearer to the end of the lifetime of VE, to be in line with current guidance, policy and legislation. Any such methodology would be agreed with the relevant authorities and statutory consultees.

This will include an assessment of Air Quality impacts associated with the decommissioning phase. This ensures all potential impacts will be assessed at an appropriate stage – when information is available. Decommissioning works would be undertaken in accordance with best practice measures. This is a project design measure.



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