

Norfolk Vanguard Offshore Wind Farm

The Applicant

Responses to First

Written Questions

Appendix 11.1 – Cable Route Info Sheet (Autumn 2018)

Applicant: Norfolk Vanguard Limited
Document Reference: ExA;WQApp11.1;10.D1.3
Deadline 1

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Photo: Kentish Flats Offshore Wind Farm



Commitment to minimising impacts and responding to local concerns

Commitment to HVDC technology - This commitment has resulted in:

- The number of cable circuits to be installed throughout the cable route (including trenchless crossings and landfall) being reduced from six to two.
- Removed the previous requirement for a cable relay station (CRS) near the North Norfolk coast.
- Reduced the onshore cable route working width from 100m to 45m.
- Reduces the maximum number of cable installation phases from three to two.
- Reduces the total number of jointing bays for Norfolk Vanguard from 450 to 150.
- Reduces materials and subsequent traffic requirements.
- Reduces number of link boxes from approximately every 1-3 km to every 5km, if required.

Strategic approach to delivering Norfolk Vanguard and Norfolk Boreas

- Subject to both Norfolk Vanguard and Norfolk Boreas receiving consent and progressing to construction, onshore ducts will be installed for both projects at the same time, as part of the Norfolk Vanguard construction works. This would allow the main civil works for the cable route to be completed in one construction period and in advance of cable delivery, preventing the requirement to reopen the land and thus minimising disruption.

Commitment to sectionalised duct installation

- The onshore cable duct installation strategy is proposed to be conducted in a sectionalised approach in order to minimise impacts. This would minimise the amount of land being worked on at any one time and would also minimise the duration of works on any given section of the route

Trenchless Crossings

- Commitment to trenchless crossing techniques to minimise impacts to specific features such as major roads, railways, main rivers and county wildlife sites.

Onshore Cable Route

Autumn 2018

This information sheet supplements details regarding the onshore cable route presented in the April FAQs document¹ and summarises key documents submitted as part of the recent planning application relating to the management of the construction to ensure proposed mitigation requirements are enacted. Links to relevant documents within the planning application are provided within this sheet for further information.

Method of installation

Construction along the onshore cable route will occur in three distinct stages. The pre-construction stage which prepares the cable route for access and excavations; duct installation stage where ducts are buried along the length of the cable route to accommodate cables for both Norfolk Vanguard and Norfolk Boreas; and the cable pull and jointing stage where cables are pulled through the pre-installed ducts to connect the wind farm to the National Grid.

The activities and procedures for each stage of the construction are briefly summarised below with further details available in FAQs and Chapter 5: Project Description of the Environmental Statement - Section 5.5.2.²

1. Pre-Construction

- Road Modifications - New or improved junctions off existing public highways to allow for construction traffic to mobilisation areas and associated locations.
- Hedge and tree netting / removal.
- Ecological preparations.
- Archaeological preparations.
- Pre-construction drainage.

2. Duct Installation

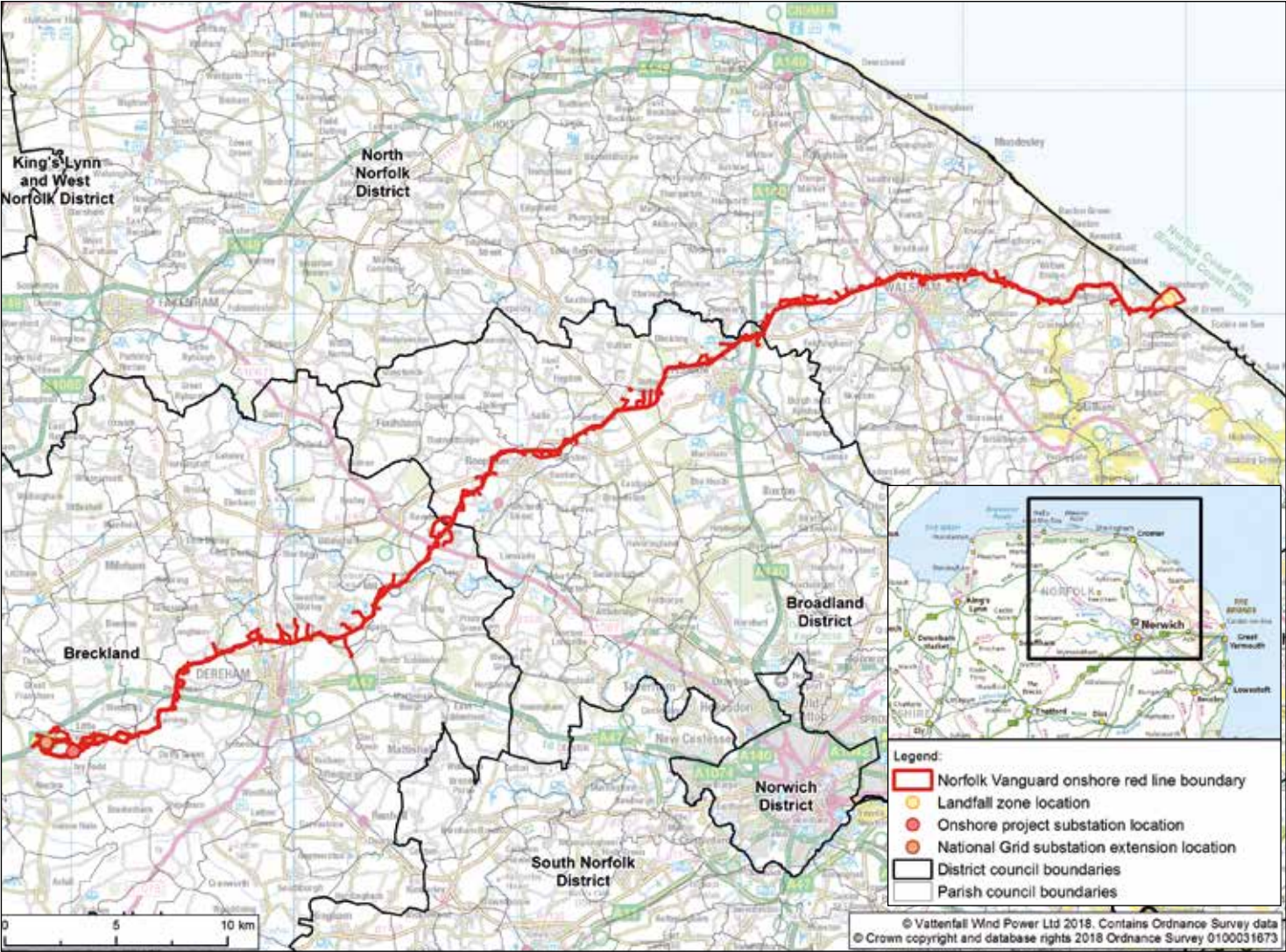
- Establish mobilisation areas (100m x 100m) distributed along the cable route³. These locations act as the access point from the public highway to the cable route and include welfare facilities, site offices, materials storage and car parking amongst other functions to facilitate the duct installation.
- Establish running track within the cable route between the mobilisation area and the workforce.
- Workfront excavates trenches in approximate 150m lengths, lays ducts to a minimum depth of 1.05m within trenches and backfills. Each 150m length is estimated to be 1 weeks work.
- Following completion of the cable route section assigned to the workforce (average of 4km), land is reinstated, including associated mobilisation area.

- Multiple workfronts to be operating in parallel along the length of the cable route to minimise installation time to within the 2 year period.

3. Cable pull and jointing

- Use of cable logistics area for local site offices and temporary cable storage, located near Oulton (strategic central location along the length of the cable route).⁴
- Use of construction accesses and direct public highway to cable route accesses (no requirement for mobilisation areas).
- Establish short lengths of running track within the cable route where necessary (we estimate this would require no more than 20% of total cable route length to be re-established temporarily) to access joint bays from access point, with joint bays at approximate 800m intervals.
- Pull cable through pre-installed ducts between joint bays, joint lengths of cable and establish link boxes (if required and at minimum 5km spacing).
- Reinstate land.
- Approximately 5 weeks per joint location allowing for establishment and reinstatement although elapsed time may be up to 10 weeks appreciating that two joint bays need to be open concurrently to allow cables to be pulled between and jointed within the bays.
- Multiple cable pulling/jointing teams to be operating in parallel along the length of the cable route to minimise installation time.
- Cables are proposed to be pulled in up to two separate phases for Norfolk Vanguard, with each phase lasting up to 1 year.

¹ <https://corporate.vattenfall.co.uk/contentassets/bf0e5e31bbab467eaf02040c7b17513a/nvb-faq-apr18-l.pdf>
² <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001493-Chapter%2005%20Project%20Description%20Norfolk%20Vanguard%20ES.pdf>
³ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001667-Figure%205.04%20Onshore%20Project%20Area.pdf>
⁴ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001667-Figure%205.04%20Onshore%20Project%20Area.pdf>



Keeping Informed

Ahead of and during construction, the project will proactively seek to inform local residents, Parish/Town Councils and other stakeholders of the type and timing of works programmed as further details become available. A local liaison officer will respond to queries and concerns.

Working Hours

Working hours will normally be 7am to 7pm five days per week, plus 7am to 1pm on Saturdays, however there may be certain exceptions which will be discussed with the local authorities (for example, larger components may be best delivered outside these hours to avoid traffic impacts and limited 7 day 24 hour working may be required during trenchless crossing activities).



Traffic and Transport

Materials such as aggregate for the running track (to protect the subsurface), ducts, stabilised backfill and associated machinery will be delivered to the mobilisation areas in heavy goods vehicles (HGVs) during the duct installation, in addition to the daily workforce in light vehicles. The duct installation period of the construction will see the greatest quantum of construction traffic.

Chapter 24 of the application details the traffic and transport baseline traffic flows (forecast to 2022), estimated vehicle movements to supply materials and manpower (including potential source locations and associated contingencies for alternate sources and increased material requirements) and assesses the impacts of these movements and any additional mitigation which may be required.

The public road network to be used to access the mobilisation areas is presented in Figure 24.1⁵ of the application which distils the road network into individual links which are assessed. A commitment has been made to restrict HGVs from entering the centre of the main towns along the route such as Dereham, Reepham and Aylsham. Furthermore, from the mobilisation area, the materials will be transported to the workfront via the running track within the cable route, minimising vehicle movements on the public highway.

A summary of the construction impact assessment per link is presented in Appendix 24.38 of the application. Where enhanced mitigation measures are identified to be required these are detailed as per Table 24.28 of Chapter 24 and secured in the relevant management plans (see overleaf for further details on management plans).

⁵ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001863-Figure%2024.01%20Study%20Area.pdf>

Enhanced Traffic Management Plan (TMP) Measures
Driver training and toolbox talks
Driver information packs to include: <ul style="list-style-type: none">• Delivery timing constraints (e.g. school arrival/departure times);• HGV delivery routes;• Diversion routes; and• Identify safe areas to pull over to reduce the effect of slow moving platoons of vehicles
Safety Awareness – Educate drivers to report ‘near misses’
Engagement structure – to provide clear governance and reporting (stakeholders) structure
Monitoring and Reporting – To monitor traffic flows at mobilisation areas and the onshore project substation
Contact information at all roadwork sites and robust complaint response standards (7 days)

Programme*

The three phases of construction across the onshore cable route will occur concurrently within the proposed timescales of pre-construction across 2020/21, the duct installation across 2022/23 and the subsequent cable installation in 2024 and 2025. It should be noted that works will be localised along the cable route for shorter periods of time during these periods.

Activity	Year					
	2020	2021	2022	2023	2024	2025
Onshore cable route						
Preconstruction works						
Duct Installation works						
Cable Pull, Joint and Commission						
Phase 1						
Phase 2						

*Construction years noted in this document are indicative and represent our desired programme. While the durations of each stage are set, dates may change depending on other factors such as Contracts for Difference (CfD) awards.

Management Plans

As part of the DCO application a number of outline management plans have been provided relevant to the onshore construction. These management plans form the basis for enacting the mitigation measures identified from the assessments to minimise impacts and the construction best practice methods to be employed during construction. These outline plans will be further developed post consent as detailed design of the project is conducted and are required to be agreed with relevant statutory authorities prior to construction commencing. Abiding by the management plans will be a condition of the DCO. Onshore management plans include:

- **Outline Code of Construction Practice (OCoCP)**⁶ – Sets out the management measures which we will require our contractors to adopt and implement for any onshore construction works for the project and related off-site activities. The CoCP, once finalised, provides a key mechanism, enforceable via Requirement 20 of the DCO, through which the relevant regulatory authorities can be assured that environmental impacts associated with the construction of the onshore infrastructure will be formally controlled and mitigated.
- **Outline Traffic Management Plan (OTMP)**⁷ – Sets out the standards and procedures for managing the impact of Heavy Goods Vehicles (HGV) traffic during the onshore construction period, including localised road improvements necessary to facilitate the safe use of the existing road network, in accordance with Requirements 21 and 22 of the Draft DCO.
- **Outline Travel Plan (OTP)**⁸ – Sets out a comprehensive strategy, in accordance with Requirement 21 of the DCO, on how onshore construction employee traffic would be managed and controlled to ensure the project is within the bounds of the assessed employee generated traffic impacts. The purpose of the OTP is to limit employee traffic

Selective Use of Trenchless Methods

We have committed to trenchless installation methods underneath a number of sensitive features along the cable route. This allows direct impacts to features to be mitigated, however the application of trenchless methods has been carefully considered as it can have a number of disadvantages such as:

- Can be more time consuming due to requirement to establish and demobilise drilling rigs, extending the installation programme and generating impacts in a single location for a prolonged period compared to continuous advance of sectionalised duct installation method.
- Requires specialist equipment and services.
- Typically requires additional land take to accommodate temporary drilling rig works area.
- Continuation of the running track may be required to allow works beyond the feature being crossed.
- Typically requires additional site investigations to understand deeper geology which introduces further pre-construction works. Deeper installation can also introduce additional risks associated with groundwater and require increased cable sizes.

It is possible that additional trenchless crossings beyond those currently committed to could be considered post consent, should the benefits of such methods outweigh the disadvantages.

movements and reduce traffic impacts on local communities and commuters in Norfolk. The OTP presents an outline of measures that could be employed to meet these targets, such as encouraging more sustainable methods of travel for construction employees and promoting travel alternatives to single occupancy car trips, but does not seek to be too prescriptive to ensure that innovation by the contractor in bringing forward the final Travel Plan is not constrained.

- **Outline Access Management Plan (OAMP)**⁹ – Sets out detail on the location, frontage, general layout, visibility and embedded mitigation measures for access for the onshore project substation, landfall and points of access to the onshore cable route. It presents the requirements and standards that will be incorporated into the final access design and to be observed as part of Contractor’s obligations to comply with Requirements 21 and 22 of the DCO.
- **Outline Landscape and Ecological Management Strategy (OLEMS)**¹⁰ – Sets out the landscape and ecological mitigation and enhancement measures that are deemed necessary on the basis of the assessment of impacts during construction, operation and decommissioning of the onshore works. We will work with the relevant local authorities to ensure appropriate resourcing is in place to monitor compliance with the provisions of the OLEMS, and the plans and schemes of which it forms the basis.

⁶ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001926-8.01%20Outline%20Code%20of%20Construction%20Practice.pdf>
⁷ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001933-8.08%20Outline%20Traffic%20Management%20Plan.pdf>
⁸ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001934-8.09%20Outline%20Travel%20Plan.pdf>
⁹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001935-8.10%20Outline%20Access%20Management%20Plan.pdf>
¹⁰ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001932-8.07%20Outline%20Landscape%20Ecological%20Management%20Strategy.pdf>

Electromagnetic fields (EMF)

Norfolk Vanguard and Norfolk Boreas Offshore Wind Farms will deploy HVDC transmission technology to transmit power into the National Grid. Expert bodies including Public Health England, the World Health Organisation and the International Agency for Research on Cancer have reviewed the available evidence from studies of humans and animals, and do not identify any health risk for humans or animals exposed to DC magnetic fields.

Furthermore, government EMF guidelines set to protect public health are outlined in a Code of Practice, that was developed by the UK Government. The Code of Practice will be adhered to, to ensure that the maximum EMF strengths that could be generated by the proposed design are well below the guideline exposure limits. This includes any cumulative EMF associated with other electricity circuits, such as Hornsea Project Three. See also our EMF leaflets.¹¹

¹¹ EMF Leaflet 1 – <https://corporate.vattenfall.co.uk/contentassets/bf0e5e31bbab467eaf02040c7b17513a/vattenfall-emf-information-sheet.pdf>
EMF Leaflet 2 –<https://corporate.vattenfall.co.uk/contentassets/bf0e5e31bbab467eaf02040c7b17513a/vattenfall-orsted-emf-information-sheet.pdf>

