Date: 25 January 2021

Application by Aquind Limited for a Development Consent Order for the 'Aquind Interconnector' electricity line between Great Britain and France (PINS reference: EN020022)

Comments on the ExA's further written questions (ExQ2) [PD-031] (question references LV2.9.1 and LV2.9.2) and related appendices

On behalf of

Mr. Geoffrey Carpenter & Mr. Peter Carpenter

Registration Identification Number: 20025030

Submitted in relation to Deadline 7 of the Examination Timetable

BLAKE MORGAN

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1. ExA WQ 1 (ref: LV2.9.1):

"*The new viewpoint photography provided by the Applicant at Deadline 6 [REP6-055] to [REP6-057] is welcome. It is noted that new VP 1b and new VP 2 closely replicate VP 15 and VP 1 in terms of compass direction, but in both cases are from lower elevations. Please could the corresponding elevations (AOD) for the new viewpoint locations be provided so that they can be accurately compared with the elevations provided for VP 15 and VP 1.*

Please could the Applicant provide visualisations of the Proposed Development on the baseline photographs from new VP 1b and new VP 2, together with an assessment of effects, including any breaking of the skyline by the Converter Station building and structures.

***Could confirmation be provided that all three magnifications of new VP 2 are at a bearing of 211 degrees, noting that the higher magnification photographs (15.60B and 15.60C) are not centred on the broader, panoramic shot (15.60A)*".**

Comments

2. Mr. Geoffrey Carpenter and Mr. Peter Carpenter (the "Affected Party") have no specific comment on the additional viewpoints VP1b and VP2 as they are located to the north of the converter station but comment on their context.

3. By way of general comment in relation to the Examining Authority's (the "ExA") request for visualisations of the proposed development on the baseline photographs and an assessment of effects we would reiterate our concern that none of the visualisations have been amended to take into account ash dieback ("ADB") following survey in September 2020 and its actual possible effect of lowering the future baseline of ADB affected tree belts which form an integral part of the Applicant's short, medium and longer term visual mitigation for the scheme.

4. The ADB survey [**AS-054** Appendix 3] identified progression of ADB throughout Stoneacre Copse [**AS-054** Annex 1 Figure 1]. It refers to the Tree Council's 'Ash Dieback Disease: A Guide for Tree Owners (June 2020)' (**Appendix 1**) and uses the four part assessment method used by Suffolk County Council which identifies four classes based on the percentage of crown remaining (see **Appendix 1** of this response Section 3 page 13). The June 2020 document also very helpfully provides indicative images of what trees could actually look like at those various stages of Classes 1 to 4. Given these visualisations it becomes abundantly clear how visual

mitigation could be affected by ADB. The difference between Class 1 and Class 4 is significant during the summer when trees should be providing maximum screening.

5. Stoneacre Copse is identified and surveyed as 'Woodland F' and the conclusion of the Applicant is that "*losing ash in this woodland would have a significant impact on visual amenity as assessed in the LVIA*". This is particularly so because the Stoneacre Copse tree belt is of relatively narrow width in its western and central parts and consequently any thinning of canopies will have significant effect. It accepts that Stoneacre Copse provides important visual screening for residential properties off Broadway Lane and Broadway Lane (south) as well as recreational receptors to the east, south east and south and partially screens more elevated views of Lovedean Sub-Station.

6. Despite this, the landscape and visual impact re-assessment at [**AS-054** Appendix 2] fails to re-assess visual impact in relation to all relevant residential receptors, including residential properties 11 and 12 and concludes, in section 5.4.2 entitled "*Would the change generate new or different likely significant environmental effects?*", that the "*Applicant's EIA team do not consider that the Proposed Changes generate any new or different likely significant environmental effects*". This conclusion is despite the conclusion about Woodland F (above) and the admission in Section 4 that "*losses to woodland as a result of ash dieback would erode the future baseline considered in the ES as the disease will cause the deterioration and loss of trees that provide a screening function*".

7. In addition to wondering why the impact on certain residential properties has not been re-considered we also note the inclusion in the description of development in the draft DCO **[REP6-015]** and Explanatory Memorandum **[REP6-018]** for the extension of the "*existing substation, including site establishment, earthworks, civil and building works*" within Works No 1.

8. This work appears to be the delivery of the extension of the existing Lovedean Sub-Station granted under planning reference 13/01025/FUL to National Grid and is to be located on land between the proposed converter station, the existing station and, most importantly, immediately to the north of the northern end of Stoneacre Copse. We show the location plan and proposals plans at **Appendix 2** of this response. If this is the case there are a number of points to raise.

9. Firstly, assuming that the permission for that sub-station extension may not have lapsed in September 2016 because, despite its age there is evidence of discharge of conditions including pre-commencement conditions, and because the Applicant's **[APP-118]**, 6.1.3 Environmental Statement - Volume 1 - Chapter 3 Description of the Proposed Development, includes at Plate 3.4 Proposed Eastern and Western connection bays which shows the constructed bays:

> *"3.6.2.1 To facilitate the connection to the National Grid Lovedean Substation, it will be necessary to provide additional electrical infrastructure. The electrical connection equipment at Lovedean Substation is expected to be a combination of Air Insulated Switchgear ('AIS') and Gas Insulated Switchgear ('GIS').*
>
> *3.6.2.2 It will be necessary to connect two HVAC Cable circuits (each comprising three cables). One connection point is proposed to be located on the western side of the Lovedean substation and the other on the eastern side of the substation for each HVDC Circuit, as shown in Plate 3.5."* (emphasis added)

10. Plate 3.4 of the Environmental Statement **[APP-118]** includes in red a notation describing the "*substation extension*".

11. If the permission has been saved by the undertaking of some material works by National Grid constituting lawful implementation then it is notable that the permission has not been identified to date in documents such as the Onshore Short List of Developments [**APP-347**, Sheet 1, and **APP-347(a)**, Sheet 1] *against which* environmental effects are assessed **[APP-144]**. But, **[APP-110]**, 5.4.2 Planning Statement - Appendix 2 Planning History, Table 1, Planning History, contends that Planning Permission reference 13/01025/F for the:

"Extension of the existing substation to include additional electrical equipment - shunt reactor, static var compensator and super grid transformer" has been "*approved and implemented*" (emphasis added).

12. If implemented, there seems no actual need to include it as "*authorised development*".

13. If secondly, alternatively that planning permission has lapsed and is envisaged to be delivered as a new element part of the Application then it appears to constitute a change and ought to have been included from the start and not sought to be shoehorned in at this late stage and

(without yet even an application to change the DCO or its Rochdale Envelope Parameter Envelope (see changed draft DCO **[REP6-015]** at Deadline 6)). As at Deadline 7, there remains no formal application to change the Application element by *extending* their scope.

14. The only explanation for this proposed extension and increase in the scope of the development can be found in the Schedule of Changes to the Draft DCO document **[REP6-041]** which asserts at page 46 that, "*updates are made to the description of Work No.1 to more clearly describe the works to be approved following a request from NGET for additional clarity*". There is no other explanation given for the exceptionally late addition and no request for a change yet to include this new element within the scope of the "*authorised development*". But there was no prior description of the extension itself being in the DCO, as opposed to works to connect to the extension itself (i.e. that assumed that National Grid would execute its own planning permission (if implemented). The Affected Party cross-refers to the Appendices of the ExA's WQ1 Comment on Rochdale Envelope, Vanguard DCO Environmental Statement in which an "extension" by National Grid is a discrete element of that application development, in addition to the Converter Station element. See **ExA WQ 2 (ref: LV2.9.2) Comments: Appendix 1, page 2, Section 5.1, paragraph 4, bullet 4**: "extension to the Necton National Grid substation and overhead line modifications".

15. Secondly, such an addition to the elements of or scope of the project falls to be regarded as significant in itself (see **Appendix 3** of this note which shows the proposals as taken from National Grid's Design and Access Statement) and the project re-assessed accordingly. The existing sub-station extension did in its *own right* require environmental assessment. The Affected Party has included previously extracts from that environmental statement for that particular project.

16. There is little mention of this extension in the Application documentation, but the most pertinent being in the Assessment of Landscape and Visual Effects **[APP-406]** which envisaged, "*for a future baseline it is assumed <u>landform</u> on National Grid land would alter to accommodate the extension*". That is not a robust or transparent enough statement to rely on at this late stage to avoid an updated or supplementary ES/VIA exercise and does not assume construction of the extension as part of the authorised development itself.

17. Thirdly, the spread of ADB within this northern part of Stoneacre Copse would actually undermine the future visual baseline for short and medium term screening of this additional sub-station extension and that has clearly not been factored into any visual assessments or visualisations to date within the Application ES.

18. Fourthly, it does not appear that certain amended landscape mitigation plans [**REP6-027**, **REP6-028** and **REP6-054]** have been updated as they continue to show proposed calcareous grassland as landscape mitigation and this assumes an unbuilt extension and not a built extension. There remains no landscape mitigation plan showing the built out extension, nor regard to the ES for that planning permission.

ExA WQ 1 (ref: LV2.9.1) Comments: Appendix 1

Tree Council: 'Ash Dieback Disease: A Guide for Tree Owners (June 2020)

June 2020

ASH DIEBACK DISEASE

A GUIDE FOR TREE OWNERS

CONTENTS

THIS GUIDANCE **IS** FOR YOU **IF**:

- **You are a homeowner or landowner and have trees on your land**
- **You think you may have ash trees on your land**

THIS GUIDE WILL HELP YOU TO:

- **Understand what ash dieback disease is and its impacts**
- **Learn to spot ash trees and understand what the signs of ash dieback look like**
- **Understand your responsibilities**
- **Understand options for managing affected ash trees**
- **Understand the value of ash trees and the environmental impact of ash dieback**
- **Understand the importance of replanting trees where possible and what species to plant**

What is ash dieback disease?

Ash dieback is a highly destructive fungal disease affecting ash trees. It causes leaf loss and canopy decline and in some cases causes the trees to die. The disease was first officially recorded in the UK in 2012 and is now widespread across England, Wales and Scotland.

Why is it important?

Ash trees are the third most common tree in Britain, present in woodland, hedgerows, parks and gardens across the country and have much cultural significance in our urban and rural landscapes. They are also valuable habitats for over 1,000 species of wildlife, including a wide range of mammals, birds, invertebrates, plants and lichens.

It is estimated that there are more than 60 million ash trees outside woodlands in the UK and that the majority will become affected with ash dieback in years to come. A proportion of these infected and weakened trees will pose safety risks, especially if they are next to a busy road, public pathway, school or community grounds. Anyone with an ash tree on their land has a responsibility to ensure that risk posed by the tree is kept within appropriate limits.

The future of ash trees

A small proportion of ash trees may have what's called 'genetic tolerance' to ash dieback, meaning they will survive and reproduce to create the next generation of trees. Therefore, tree owners have an important part to play in understanding the impacts of ash dieback on the environment and protecting tolerant and resistant trees and their associated wildlife wherever possible and safe to do so.

A typical ash tree

1. What is ash dieback disease?

How will ash trees be affected by ash dieback?

Ash dieback is caused by a fungus called *Hymenoscyphus fraxineus* (formerly known as *Chalara fraxinea*). It arrived in Europe from Asia during the 1990s and rapidly spread. Although the first official record in Britain was in 2012, later analysis shows that some UK trees were infected with the fungus as early as 2004.

The disease is a serious threat to the future of the common ash tree. Research from the UK and Europe has found that seven or eight out of every 10 ash trees may die (although there are some local variations), but some trees do show some levels of tolerance and may even recover over time.

Some research carried out in France and published in April 2020, suggests that isolated ash trees, such as those growing in hedges or other open areas, may be less affected by ash dieback than those in woodlands. Whether this will be the case in Britain, only time will tell.

The ash dieback fungus progressively damages the vascular tissues of the tree, causing particular branches to die back by blocking their supply of water and nutrients, hence the name.

Ash dieback causes a range of symptoms including wilted and spotted leaves (see page 12 for more information and images). Most affected ash trees will lose some of the leaves at the top of the tree (which is called its crown). However, ash dieback can affect trees in different ways – for example, some may develop dark patches called 'basal lesions' at the base of their trunk, but have no sign of ash dieback in their leaves and branches. This is why it's important to **consult a tree professional** if you are unsure.

Image © Jon Stokes

Ash trees in a woodland declining due to ash dieback

Once the fungus infects a tree, the dead or dying branches can become brittle and fall. Over time, as the tree loses nutrition, water and the leaves which produce its food, the disease may eventually kill the tree. However, often other opportunistic disease-causing organisms (pathogens), such as honey fungus or shaggy bracket, may cause the eventual death of the tree by accelerating wood decay and tree failure rather than ash dieback itself.

Images © Jon Stokes

Honey fungus

Shaggy bracket fungus

How important are ash trees in Britain and what are their benefits?

Ash trees are hugely valuable native trees and support almost 1,000 species including a huge variety of lichens, invertebrates and other wildlife. They are a valued part of our national treescape, especially in limestone areas such as the Cotswolds, where ash have been dominant and were historically managed as old pollards, particularly for wood fuel.

The annual estimated social and environmental value of ash trees growing outside woodlands is an estimated £230 million. Ash is a precious native species and no one tree can entirely replace it.

Ash dieback will have an impact on local ecosystems and the appearance of many urban and rural green spaces we enjoy. However, if we work together across the country to tackle the issue, the disease presents an opportunity to develop UK 'treescapes' that are more resilient to pests, diseases and other threats.

Image © Jon Stokes

A hedgerow ash in the Cotswolds

2. The science

How is ash dieback spread?

Tiny fungal spores land on the leaves of an ash tree or at the base of the trunk. These wind-borne spores are produced from small white mushroom-like structures, **pictured right**, which grow on last year's fallen ash leaf stalks in the leaf litter.

While the fungus is naturally spread via airborne spores, it can also be spread by moving infected trees through trade, or moving fallen leaves.

Image © Jon Stokes

Are any trees resistant to the disease? Is there a cure?

There is no known cure to this tree disease. However, there is long-term hope as several studies have reported that a low percentage of ash trees – between 1% and 5% of the population – may have a genetic tolerance to ash dieback, meaning they can survive and reproduce to eventually create the next generation of ash trees.

By retaining trees with no or limited signs of ash dieback, owners and tree managers might allow precious ash dieback-tolerant trees to live and reproduce.

In addition, dying and dead ash trees have huge ecological value, especially mature, veteran and ancient trees, so provided that they are managed following current guidance on **tree risk management**, it's important to keep them in the landscape.

Owners of ash trees in areas open to the public will have to balance conserving ash with managing ash trees which might pose a danger to the public. It is important all owners of ash trees understand their responsibilities (**see page 14**).

Does the fungus present a threat to humans or animals?

No, there is no evidence that the fungus can affect or infect humans or animals. The safety threat comes from dead or dying trees falling or dropping branches, causing injury or damage.

How quickly will an infected tree die?

It is not possible to predict how long it will take for a specific tree to decline. The climate, site conditions and local tree cover appear to play a large role in the extent to which trees are affected by the disease. Isolated trees, trees growing in open areas or those in hedges appear to be far less affected than those in a forest environment.

The photographs in **Figure 1** show the change in one tree in Devon over one season (photographs taken on 6.7.2016

Clearing fallen leaves from around infected trees

As the fungus grows in the leaves that fall on the ground in the autumn, clearing the leaf litter from around the bases of ash trees may reduce the levels of fungus spores present, which may increase the chances of the trees surviving for longer. This action should be considered especially for ancient, veteran or other trees of special importance. Always observe good biosecurity practices – more information can be found on the **government website**.

Images from top to bottom: © Rob Wolton, Jon Stokes

Figure 1: Change in one tree over one season

and 7.7.2017). The pictures show a 10%-15% decline in the crown of a mature tree in a single season. However, reports show different rates of decline on a site-by-site basis.

Young ash, and those which have been coppiced (cut down to the base to encourage new growth) appear to generally decline from the disease quickly, while some ancient and mature trees, and ash trees outside woodlands, appear to be able to live for many years with the disease. However, mature ash trees with ash dieback can die more quickly if other pathogens, like honey fungus, take advantage of the already weakened tree. Trees have died from ash dieback in as little as two growing seasons.

Where the dark patches called 'basal lesions' are found on the trunks – usually in areas of dense ash populations and wet woodlands – these can make trees unstable and potentially dangerous more quickly. The rot found in these trees is usually associated with other secondary pathogens such as honey fungus and can occur without any obvious dieback symptoms in the crown. This makes identifying potentially 'dangerous' ash trees considerably harder. This is why it's important to learn to identify ash dieback, survey your trees and then get the advice of a qualified tree professional on what action you should take if you find any cause for concern (**See page 17**).

Stress in trees

The health of a tree can be heavily affected by its living conditions. Conditions that are not good for a tree's health are said to cause 'stress'. These might include: root damage from ploughing, root compaction caused by people walking over the land on top of a tree's roots, building development or utilities works, air pollution levels, or where a grown tree in an open area has been shaded by trees planted too close. Trees in urban settings may experience higher levels of stress, and this stress can make them more susceptible to the symptoms of ash dieback or other pests and diseases.

3. Spotting ash dieback in your trees

Where do I start?

The general steps that you may need to take to manage your ash trees are:

1. Learn to identify ash trees
2. Learn to spot symptoms of ash dieback disease
3. Survey your ash trees on a regular basis (**see page 17**)
4. Consult a qualified, insured tree professional to get some specific advice on the health and risks associated with your ash trees
5. Make a decision on whether there are any trees which might require pruning or felling, based on the advice of a professional
6. Put a management plan in place and apply for a felling licence if necessary
7. Continue monitoring your ash trees
8. Replace ash trees that are lost with another species wherever possible (**see page 21**)

How do I recognise an ash tree?

Ash is a very common tree, mostly found in woodland and hedgerows. In Britain, there are approximately 60 million ash trees growing outside woodlands, and an estimated two billion ash trees overall including all saplings and seedlings.

HOW TO SPOT AN ASH TREE

- **Leaves:** Ash leaves are 'compound leaves', comprising three to six pairs of 'leaflets', arranged in opposite pairs with one terminal leaflet at the end of the leaf

One ash leaf comprises many leaflets

- **Seeds:** Ash seeds (called 'keys') are flat single-winged seeds which hang in abundant bunches (sometimes confused with ash leaves wilted by dieback)

Ash seeds

Images © Jon Stokes

Twigs with black leaf buds

- **Twigs and leaf buds:** Ash are easily identified in winter by their smooth twigs that have distinctive black, velvety buds arranged opposite each other.

Grey/brown bark with lichen growing on it

- **Bark:** The bark is pale brown to grey, which fissures as the tree ages. Over 770 species of lichen can live on it.

Height and form

- **Height and form:** When fully grown, ash trees can reach a height of 40 metres.

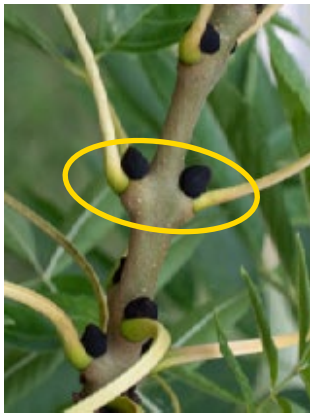
Ash is most commonly confused with the rowan tree (which is sometimes also called the mountain ash). The main differences are:

- Mature rowan trees are much smaller than ash trees, growing to only 10 metres tall, compared to up to 40 metres in a mature ash tree
- Ash trees have shiny black buds in winter, where rowan trees have brown buds
- Ash flowers are small and black, while rowan flowers are white
- Ash produce seed in the form of winged 'keys', rowan produce berries
- Although both species have 'compound leaves' the whole leaf (all the leaflets) on rowan tree are in staggered pairs on the twig, while ash leaves grow opposite each other

Rowan trees cannot get ash dieback disease, although they can be affected by other diseases such as fireblight, which could lead to confusion.

A compound ash leaf

A compound rowan leaf



Ash leaves are opposite each other

Rowan leaves are staggered on the branch

Rowan tree (above), Rowan berries (right)

How can I identify ash dieback in my trees?

It is easiest to spot signs of ash dieback during the summer when trees should be in full leaf, **like the one below**. Ash comes into leaf at different times in the spring, sometimes as late as the end of May, but by mid-June all healthy ash should be in full leaf.

Some affected ash trees will fail to come into leaf at all, while others will 'flush' normally before showing signs of ill-health or dieback later. It's important to bear in mind that failure to flush or dieback in ash can have many causes, **so if an ash tree looks unhealthy, it does not automatically mean it is affected with ash dieback.**

Image © Jon Stokes

A healthy ash tree

SIGNS OF POSSIBLE ASH DIEBACK

- Spots on the leaves
- Wilted leaves
- Branches losing their leaves and 'dying back'
- Dark patches, called lesions, on the branches and/or trunk

The symptoms are easily visible in young trees, but they can be harder to recognise in more mature trees. Unfortunately, lesions can be caused by a number of factors including other fungi and bacteria and so dark patches alone do not necessarily mean the tree has ash dieback. For more detailed information on lookalike signs and symptoms of ash dieback, see the **Observatree guidance** here.

Anyone responsible for managing ash trees should learn to recognise the visual symptoms of ash dieback so they can assess the current health of their ash tree population and then consult, if appropriate, with a tree professional on what action they might take.

Once you know what you are looking for, you should survey your trees to assess their health. If you spot signs of ash dieback, you should survey them each year to track the progress of the disease.

ASSESSING THE CROWN HEALTH OF YOUR ASH TREE

Suffolk County Council has developed a four-part system for assessing the health of an ash tree's crown. While other problems such as drought stress or root problems can cause crowns to look sparse and thin, crown health is a quick and useful gauge of the tree's overall health.

As crown health is not the only symptom of ash dieback, if you are unsure, consult with a qualified tree professional.

Spots on the leaves

Wilted leaves

Branches losing their leaves

Dark patches on the trunks

All images © Jon Stokes

By looking at the crown of an ash tree, you should be able to place it in one of the following classes. Don't worry if you're not completely sure – just make your best guess:

CLASS 1 100%–76% of the crown remains

CLASS 2 75%–51% of the crown remains

CLASS 3 50%–26% of the crown remains

CLASS 4 25%–0% of the crown remains

This system does not allow you to make specific management judgements about the safety of any individual tree, but it helps to identify trees that may need attention.

If you are concerned about the extent of decline in your tree's canopy (especially if it starts to look like a class 3 or 4 tree), you need to decide how to manage your tree. It is usually best to consult a qualified tree professional who can survey your tree or trees, assessing their condition and the circumstances in which they are growing, to advise you on what action to take. If the tree is assessed as presenting an unacceptable risk to people or property, felling may be recommended. It is important to seek guidance quickly if you think your tree may be in a dangerous condition.

Otherwise, pruning work such as the removal of dead wood, a reduction of the crown, or the removal of a specific limb might manage the safety risk while allowing the tree to continue providing benefits to the landscape and to nature.

For your management options for an ash tree **see page 16**.


Class 1


Class 2


Class 3


Class 4

4. Your responsibilities

Managing the risk from trees is the responsibility of the owners and managers of the land on which they grow. If your ash tree or one of its branches falls on someone or someone else's property, you may be liable.

Understanding the law

Under both the civil law and criminal law, an owner of land on which a tree stands has responsibilities for the health and safety of those on or near the land and has potential liabilities arising from the falling of a tree or branch. The civil law gives rise to duties and potential liabilities to pay damages in the event of a breach of those duties. The criminal law gives rise to the risk of prosecution in the event of an infringement of the criminal law. Further details can be found in the National Tree Safety Group publication **'Common sense risk management of trees'**.

Following official guidance

To help landowners understand the risk of harm posed by their trees and to manage such risk in a reasonable, balanced and proportionate way, national guidance has been produced by the National Tree Safety Group (NTSG) which should be followed by all tree owners.

NTSG's approach follows five key principles:

- Trees provide a wide variety of benefits to society
- Trees are living organisms that naturally lose branches or fall
- The overall risk to human safety is extremely low
- Tree owners have a legal duty of care
- Tree owners should take a balanced and proportionate approach to tree safety management

If you have any concerns about the health of your ash trees, you should consult a tree professional such as your Local Authority Tree Officer, or a qualified tree professional (see page 17).

Balancing safety with ecological benefits

Reasonable public safety must be the top priority when assessing what action to take on the trees you own. Levels of risk will range from low to high. Examples of locations where trees may present high levels of risks are: roads, car parks, railways, well-used public spaces, playgrounds, schoolgrounds and public right of ways.

Where ash trees pose a low safety risk, for example trees in hedges between two fields with no public access, they should be left to decline naturally so they can continue to contribute benefits to the environment (see page 17).

5. Options for managing affected ash trees

What are my options for managing my affected ash trees?

To decide which management option is most suitable for your ash trees, consider:

- Roughly what percentage of the crown has died?
- What risk does that tree pose to humans, animals or property?
- Can you mitigate the risk by means other than pruning or felling the tree (e.g. moving a pathway or a seat that is under the tree)?
- Is the tree old, or does it have a rich history worthy of preservation (ancient and veteran trees possess special cultural and ecological attributes)?
- Is the tree showing signs of tolerance to the disease?

NOTE: THESE ARE SUGGESTIONS TO HELP YOU CONSIDER YOUR OPTIONS – THE LEGAL RESPONSIBILITY REMAINS WITH YOU AS THE TREE OWNER. WHEN IN DOUBT, CONSULT A QUALIFIED PROFESSIONAL FOR ADVICE.

MANAGEMENT POSSIBILITIES

There are a range of tree management options that can be considered for trees affected by ash dieback. These include:

- Retain the tree with no work – provided the risk level is acceptable
- Deadwood removal – prune dead wood and branches showing marked symptoms of dieback to reduce the risk from falling branches
- Pollarding/topping: if the tree is posing an unacceptable risk to people or property, reduce its height by removing all the upper branches and allowing it to regrow
- Coppicing – cut the tree to the base and allow it to regrow
- Felling – fell the tree and prevent regrowth. The larger the trees, the more likely the wood will be of habitat value. Where possible, the felled wood should be left in situ in as large pieces as possible. See guidance from the **Ancient Tree Forum**.

Each of these options carries different benefits and challenges. To decide which management option is most suitable, consider:

- which option manages the risks most effectively?
- what is your purpose in taking action? Do you want to retain trees where possible, or remove all risk?

The final decisions will need to be made by the landowner but professional advice from a competent tree professional will be invaluable. To find a local professional, consult your Local Authority Tree Officer, or see **the advice from the Arboricultural Association** or the **Institute of Chartered Foresters**.

HOW DO I PUT AN ONGOING PLAN FOR TREE MANAGEMENT IN PLACE?

The National Tree Safety Group (NTSG) provides the following guidance for householders to ensure you are meeting your responsibilities:

- You don't need a written tree safety 'policy', but you should have a 'management plan' either written down or implicitly understood This can be as simple as having a set of processes agreed between yourself and anyone else who manages trees on your land (a gardener, maintenance staff) for how you ensure your trees are safe to enjoy
- In order to inspect your trees, you should walk around your garden once a year in late summer/autumn. If your trees look sound and healthy with no obvious defects, that's all you need to do
- A tree or branch with no leaves on it in summer is probably dead. If it is a large tree, or a branch at height, it may be dangerous for you to remove it, so you will need to employ a competent, fully insured tree surgeon
- If your tree has what looks like a fungus on it, **look it up** to check what its presence means or get advice from a suitably knowledgeable and experienced person

As ash dieback spreads, the number of ash tress with problems will rise. Tree managers should adapt their tree management plans to take this into account – this may include carrying out more frequent inspections of affected trees, especially if they are alongside a road or path or other high-risk sites.

When you've decided on a course of action, you should:

- Familiarise yourself with and observe all relevant tree and environmental legislation (**see page 20**)
- Ensure that trained, qualified and insured contractors carry out the work
- Wherever possible, re-plant trees with an appropriate species (**see this guidance from the Forestry Commission**)

WHERE CAN I GO FOR SPECIFIC ADVICE ON MY TREES?

The final decision on what action to take will need to be made by you, the tree owner, but you should seek professional advice from a fully insured tree management professional who holds the LANTRA Professional Tree Inspection Certificate. To find a local professional, consult your Local Authority Tree Officer, or see **advice from the Arboricultural Association** or the **Institute of Chartered Foresters**.

It's important to note that only trained and experienced tree surgeons or forestry workers should do work on ash trees affected by ash dieback. Be aware that rogue trader tree contractors operate in some areas. Seek advice from your Local Authority if you're unsure about a contractor.

HOW DO I CONDUCT AN ASH SURVEY?

Local Authorities in **Norfolk** have produced guidance on conducting annual ash surveys to assess the risk posed by ash dieback symptoms, which they have kindly shared below:

- Inspect for ash dieback in the summer (mid-June to mid-September) when trees are in leaf and record the percentage of crown 'missing'
- Where possible, take photos so you can compare the changes in the trees between inspections
- If you have many trees, prioritise inspection of your trees by risk. For example, you might start with large trees beside roads or pathways, and inspect these trees most regularly
- Unless trees need urgent safety work, plan tree work outside of the bird nesting season (February – August)

WOULDN'T IT JUST BE EASIER TO FELL MY ASH TREES NOW?

Healthy looking ash trees should not be felled in anticipation of the disease, unless there are other overriding management requirements to do so. Ash dieback is having a serious impact

on our treescape, and whatever we can do to retain trees in the landscape where safe to do so increases the chance that the next generation of ash trees will be able to grow and thrive.

Declining ash trees that may eventually die, can also continue to contribute ecological benefits if kept in the landscape for as long as possible. Therefore, where safe to do so, please consider keeping your ash trees in the landscape, and replace lost trees with other species.

MY TREE(S) MAY POSE A RISK TO THE PUBLIC – WHAT DO I NEED TO CONSIDER?

If your tree(s) are seriously affected by ash dieback and are, for example, in an area of public access or next to a road or park, you may have to notify other organisations and/or take legislation into account. For example:

- Are there any constraints from the Local Planning Authority, e.g. does the tree have a Tree Preservation Order, or do you live in a Conservation Area? (**see page 19**)
- Do you need a felling licence? (**see page 19**)
- Is your tree along a roadside or railside? If so, you should contact the local Highway Authority (e.g. your County Council) or Network Rail before undertaking any tree work
- Is the tree host to any European Protected Species, e.g. bats? (**see page 20**)
- Is the land protected as a designated site such as a site of special scientific interest (SSSI) or national nature reserve (NNR)? (**see page 21**)
- Might you be in breach of the Wildlife and Countryside Act (WACA) 1981? (**see page 20**)

Is there any money to help with the costs of managing my ash tree?

Currently there is no central or local government financial support for private individuals managing their trees with ash dieback in the non-woodland environment. It is the responsibility of the landowner to fund the management of the trees on their property, including the risks posed by ash dieback. Support for work in woodlands is available through Forestry Commission grants – see **here**.

Image © Jon Stokes

Ancient ash trees, including living, dying or dead trees which have been managed down to the main stem, can have enormous ecological benefit

What do I do if my ash tree is protected by a Tree Preservation Order (TPO) or grows in a conservation area?

If you have an ash tree which is protected by a Tree Preservation Order (TPO), subject to certain exemptions, you must obtain formal permission from your Local Planning Authority, e.g. your District Council, to undertake work on this tree. That is, unless a felling licence would normally be required, in which case you should apply for the licence and declare the presence of the TPO on the application. If you live in a conservation area and want to undertake work on an ash tree which has ash dieback, you must notify your Local Planning Authority at least six weeks in advance. This gives the planning authority an opportunity to place a TPO on the tree if considered appropriate. There are some exceptions to these rules which differ in England, Scotland, Wales and Northern Ireland, so consult your Local Planning Authority first.

Do I need a felling licence?

Tree felling is a legally controlled activity and you usually need permission to fell growing trees, including diseased ones. Licences are free and are issued by the Forestry Commission (in England) usually for a five-year period. Most felling licences will contain conditions that require felled trees or areas of woodland to be replaced by replanting or being allowed to regenerate. You generally don't require a felling license to fell single trees that are standing in a garden although other permissions may be needed.

Some exemptions exist to the need for a felling licence, including:

- There is an immediate risk of serious harm and urgent work is needed on a tree to remove the risk
- Felling which yields less than $5m^3$ of timber, to allow for very small-scale felling works. For example, a tree with a mid-trunk diameter of approx. 60cm and which stands 10-15m tall will generate c$5m^3$ of timber. You can find out more about **estimating timber volumes here**
- All trees that are standing in a garden. However, for larger estates or residences of unusual composition, land attached to a dwelling is not automatically considered to be a garden by the Forestry Commission.

There are no exemptions for diseased ash trees and the Forestry Commission therefore expects that most ash tree felling in response to ash dieback will be permitted through the use of an approved felling licence, unless the usual exemptions apply.

It's important to note that, in certain circumstances you may still need permissions from other organisations before you begin felling trees (see Tree Preservation Orders in Section 5 and Wildlife & Countryside Act and other environmental legislation in Section 6). Further information can be found in **Tree Felling, Getting Permission** and **Operations Note 46a**, both by the Forestry Commission.

Guidance varies from country to country. You can find out more specific information on felling licences and exemptions in England, Scotland, Wales and Northern Ireland in the links below.

• **England** | • **Northern Ireland**
• **Scotland** | • **Wales**

6. Conservation and promoting a healthy treescape

Keeping ash trees in the landscape for the future

The Tree Council, Defra and the Forestry Commission advocate that ash trees that do not pose a health and safety risk should be retained in the landscape wherever possible so they can continue to provide biodiversity benefits.

We strongly encourage all tree owners to replace ash trees lost by replanting other species. We hope that resistant ash trees will also regenerate naturally from seed.

What do I need to know about the Wildlife and Countryside Act?

All birds, their nests and eggs, are protected by law and it is thus an offence, with certain exceptions, to:

- Intentionally kill, injure or take any wild bird
- Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built

It is therefore necessary to ensure that any management work on an ash tree does not disturb nesting birds. If you think you have nesting birds using your ash tree consult a tree professional (**see page 17**).

What do I need to do about European Protected Species (EPS)?

If there are rare, threatened or protected species in an ash tree (such as bats which may use holes in an old ash tree), specific advice is needed to protect them. It is illegal to:

- Capture, kill, disturb or injure them (on purpose or by not taking enough care)
- Damage or destroy their breeding or resting places (even accidentally)

To understand the law on protected species see the **gov.uk website**, which shows how to apply for a protected species licence. If you think you have bats or other protected species using your ash tree consult a tree professional (**see page 17**).

Image ©Commons / Allan Hopkins

A garden warbler in an ash tree

What do I do about ash trees in parks, public open spaces and heritage sites?

In public open spaces and public parks, the safety risks posed by ash dieback will be managed by the Local Authority or landowner, who will be responsible for managing their trees. If you see an ash tree that concerns you, contact the owners, describing the location and condition of the tree(s) in question.

What do I do if my ash trees are in a designated site of special scientific interest (SSSI) or a national nature reserve (NNR) etc?

Natural England and the Forestry Commission have produced specific guidance on how to manage ash trees in protected sites. For details, see **here**.

What species should I replace ash with?

There is no one tree that can replace ash. However, **aspen, alder, field maple, sycamore, birch, rowan, oak and disease-resistant elm** are all good choices.

Your choice depends on why the replacement tree is being planted – is it for timber, wildlife or aesthetics? You might consider the following factors:

- Ash trees have a big beneficial impact on soil quality. **Alder** and **lime** leaves have similar qualities, as do to a smaller extent **sycamore**, **field maple** and **aspen**
- Many of the generalist birds and mammals that feed on ash can also be found on **oak** and **beech**, **sycamore**, **birch** and **hazel**

A mature oak (left), and a mature sycamore (right)

Images © Jon Stokes

- For the specialist ash related insects, mosses and lichens, disease-resistant **elm** is the best substitute, followed by **sycamore**, **aspen**, **oak** and **hazel**

Alternative tree selection also varies depending on the conditions of the site where the tree will grow and the type of location, such as a hedgerow, garden or park.

New ash trees can be allowed to grow from seed (natural regeneration), but it is likely that most of these young trees may die from ash dieback themselves. Of course, any that survive may be the future of our ash population and should be nurtured carefully.

It is now theoretically possible to buy ash trees from nurseries within Britain and Europe. However, The Tree Council cannot recommend the purchase or planting of any ash trees at this stage, as there are currently no guaranteed disease-resistant strains available on the market.

An Ash Dieback Resilience Group has been set up in Devon and **suggests the following:**

1 Act now to minimise the landscape impact of ash tree loss – start promoting new trees and taking better care of existing trees

2 Use the Devon 3/2/1 formula: plant at least 3 new trees for loss of a large tree, 2 for a medium tree and 1 tree for a small tree

3 Promote natural regeneration (letting new trees grow from the natural seeds) wherever possible, particularly in woodlands

4 Grow the right trees in the right places in the right ways and give them the right aftercare

5 Encourage a diverse range of trees to develop a resilient landscape

6 When choosing species, consider local factors such as what trees are characteristic of the area, soil type, management requirements, local stresses

7 For wildlife, landscape and woodfuel, choose native species, or those well established in the British Isles, such as sycamore, wild pear, crab apple or white willow. In urban areas it is more acceptable to use species from other parts of the world

8 Reduce the risks of introducing new diseases by only planting trees grown in Britain, by reputable nurseries

Ancient, veteran and heritage trees

Ancient, veteran and heritage trees are irreplaceable. They have great ecological, cultural and amenity value.

Much of the value of these trees can be retained for a long time, even after they have died. There is also some evidence that ancient and veteran trees may be more tolerant to ash dieback than other ash trees.

Therefore, when considering what action to take on such a tree, the advice of an experienced tree consultant who is knowledgeable in the care of ancient trees and their management for reasonable public safety should be sought. They will be able to advise on the level of risk posed and help you understand your options. For example, in some circumstances moving the 'target' (i.e who or what might be harmed) by fencing off an informal footpath may be a simpler and less costly option than removal or carrying out drastic tree surgery.

If there are no health and safety reasons that demand work to ancient, veteran, heritage or any other isolated ash trees, where possible the trees should be left to decline naturally. If leaf litter gathers around the base of these trees, it should be removed and destroyed (such as by composting), to reduce the levels of the fungus present.

Terminology:

Ancient trees are those which have reached a great age in comparison with others of the same species.

Veteran trees can be any age, but will have ancient characteristics such as heartrot or hollowing of the trunk or major limbs.

Heritage trees are trees that are part of our history and culture, and can be connected with specific historic events or people.

Source: Ancient Tree Forum

Image © Jon Stokes

An ancient ash

About this guidance:

- This guide was produced by The Tree Council with expert input from the following organisations:
  - **Defra**
  - **Forestry Commission**
  - **Forest Research**
  - **Natural England**
  - **Arboricultural Association**
  - **Ancient Tree Forum**
  - **London Tree Officers Association**
  - **Scottish Natural Heritage**
  - **National Tree Safety Group**
  - **Suffolk County Council**
  - **Norfolk County Council**

  With thanks to all who have helped develop and review this guidance.
- The data in this document are solely the view of The Tree Council and contributors. The authors do not accept any liability for any loss incurred as a result of relying on its contents
- To find a qualified tree consultant, visit the **Arboricultural Association** or the **Institute of Chartered Foresters**
- There are a variety of online resources available to help with identifying ash dieback, including:
  - **The Forestry Commission dieback identification advice**
  - **The Observatree ash dieback identification guide**
  - **The Tree Council guide to symptoms in large trees**
  - **Arboricultural Association Ash Dieback Guidance for Tree Owners, Managers, Contractors and Consultants**
- **The National Tree Safety Group** (NTSG) provides detailed guidance on dealing with ash dieback, which should be followed by all owners of trees
- This guidance is in line with the government recommendations in the **Tree Health Resilience Strategy**, published in May 2018
- For more information on managing individual ash trees affected by ash dieback, see the **Forestry Commission Operations Note 46a**

June 2020

ASH DIEBACK DISEASE

A GUIDE ***FOR TREE OWNERS***

www.treecouncil.org.uk | info@treecouncil.org.uk

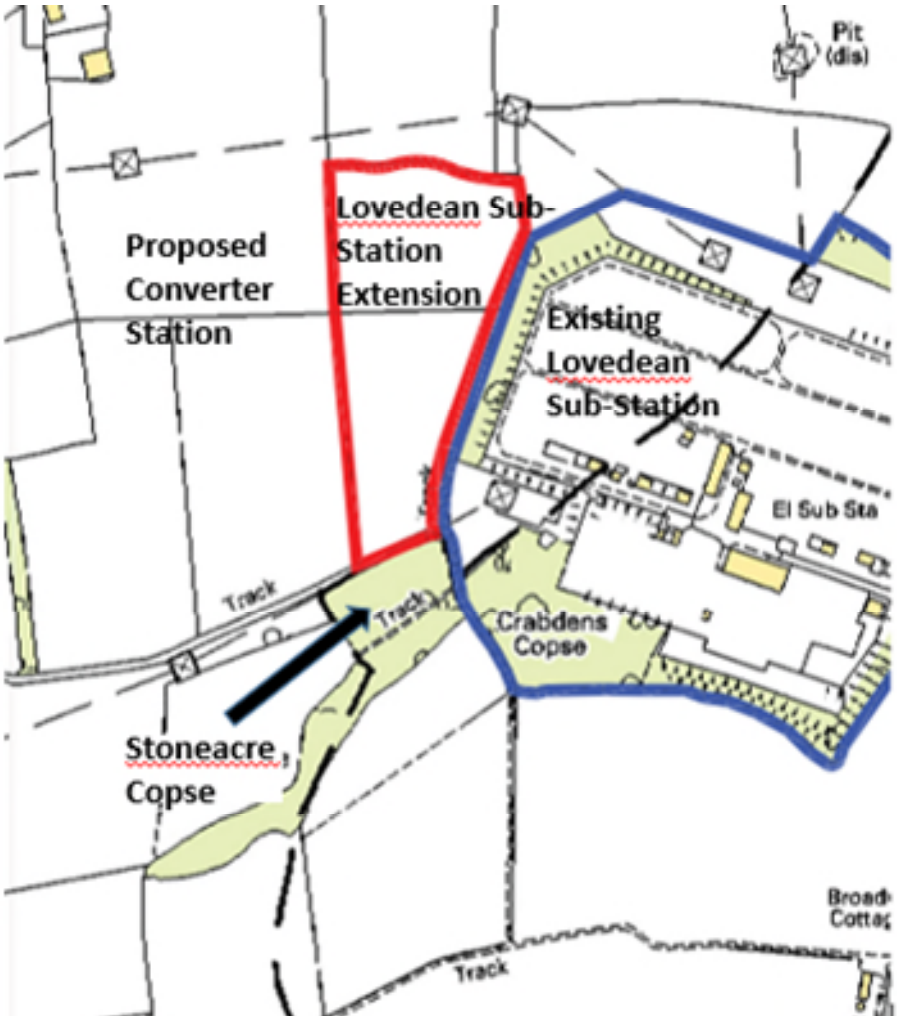
Registered charity number 279000

Department for Environment Food & Rural Affairs

the tree council

ExA WQ 1 (ref: LV2.9.1) Comments: Appendix 2

Location Plan showing position of Lovedean Sub-Station Proposed Extension in relation to new Converter Station and Stoneacre Copse



ExA WQ 1 (ref: LV2.9.1) Comments: Appendix 3

Lovedean Sub-Station Extension Proposals Plan

1. ExA WQ 2 (ref: LV2.9.2):

"*In its answer to ExQ1.5.13 in relation to the restriction of approval under draft Requirement 7 of the Ddco to Works 2, 4 and part of Works 5 (and the exclusion of Works 1, 3 and the rest of 5), the Applicant states that 'the flexibility required for design and construction meant that it was more appropriate to develop any necessary mitigation in detail <u>once</u> the final alignment and construction areas have been decided <u>and actual impacts can be understood</u>'* (emphasis added).

Please expand on the differentiation, and why some landscape mitigation measures are subject to a Requirement while others appear not to be so. If 'the actual impacts' are not yet understood for some areas, how was the LVIA carried out and reported?

***What reliance can the Examining Authority and Secretary of State place on the outcome?*"**

Comments

2. The Affected Party supports the ExA's concerns that if *landscape mitigation measures are not subject to the same requirement there is a strong suggestion that the <u>actual</u> impacts cannot have been adequately understood for some areas* because the Rochdale Envelope appears to have been set too small to contain all of the envisaged development and because the visualisations do not include a range of images showing the range of effects from Ash Die Back disease so that an evidential gap in the environmental evaluation arises (emphasis added). The 'full knowledge' required appears incomplete. The ExA cannot rely on the Landscape and Visual Impact Assessment ("LVIA").

3. The Affected Party has made previous representations on the reliance by the Applicant of a *Rochdale* Envelope Approach and adherence to the national advice to ensure a match between the relevant Envelope parameters and *their* evaluation, and also that "flexibility" is not abused by ensuring descriptions (here, the parameters) are not inadequate. This is because mitigation flows *from* the logically prior evaluation. It refers to Advice Note 9 (July 2018), paragraph 2.2 which states:

- *the assessment should be based on cautious 'worst case' approach:*
  "such an approach will then feed through into the mitigation measures envisaged […] It is important that these should be adequate to deal with the worst case, in order to optimise the effects of the development on the environment" (para 122 of the Judgement); and
- *"the need for 'flexibility' should not be abused:*
  "This does not give developers an excuse to provide inadequate descriptions of their projects. It will be for the authority responsible for issuing the development consent

to decide whether it is satisfied, given the nature of the project in question, that it has 'full knowledge' of its likely significant effects on the environment. If it considers that an unnecessary degree of flexibility, and hence uncertainty as to the likely significant environmental effects, has been incorporated into the description of the development, then it can require more detail, or refuse consent" (para 95 of the Judgment);

4. Paragraph 2.4 advises (in line with the *Smith* case):

   - *"the DCO must not permit the Proposed Development to extend beyond the 'clearly defined parameters' which have been requested and assessed. The Secretary of State may choose to impose requirements to ensure that the Proposed Development is constrained in this way"*

5. The "clearly defined parameters" in law in this Application comprise (subject to certain provisions about removing one choice), the Rochdale *Envelope* Option B(i) and Option B(ii). The Envelopes operate in three-dimensions so as to allow for three-dimensional flexibility within that envelope and do not operate in two dimensions. Indeed, in *Tew*, a bare red outline *plan* (i.e. in two dimensions) breached the requirement for a relevant envelope to evaluate.

6. The definition of "development" used in the Planning Act 2008 ("PA 2008") is the same as section 55(1) of the Town and Country Planning Act 1990. See section 32 of the PA 2008. The meaning of "development" is: "means the carrying out of building, engineering, mining or other operations in, on, over or under land, or the making of any material change in the use of any buildings or other land." "Building operations" includes "structural alterations". *"Building"* includes any structure or erection, and any part of a building, as so defined, but does not include plant or machinery comprised in a building".

7. The surprising, quite extreme degree of, flexibility sought by the Applicant is most recently seen in the Work No. 1 changed scope of elements that (as at Deadline 6 and with limited remaining Examination Hearing Time available) seeks to add to the scope of the authorised development a three-dimensional development element described as the *"extension of the existing Lovedean substation, including site establishment, earthworks, civil and building works"* and, in relation to the Affected Party's land, a Works No. 2 and 3 overlap area is now proposed including a *"temporary work area of up to five hectares associated with Work No. 1, Work No. 2 and Work No. 4 consisting of a construction and laydown compound and car parking for up to 206 vehicles including associated vegetation removal and groundworks"* to be located in the fields to the north of Stoneacre Copse as shown on Works Plan Rev 04 [REP6-008].

8. The Explanatory Memoranda [REP6-018] is updated to reflect the extension works being included as Works No. 1.

9. An Environmental Imp[act Assessment ("EIA")/LVIA should be undertaken in a manner that clearly identifies and proceeds *from* the parameters (i.e. the *maximum possible extent* of the proposals by geography, plan and height, and so volume) of all of the proposed elements of the project identified on a cautious 'worst case' approach.

10. As the *Rochdale* Envelope Note 9 advises, the principle assists where flexibility is considered appropriate to address uncertainties of detailed design and, if such flexibility is sought, then it is essential that Applicants ensure the environmental statement explains fully how the flexibility sought has been taken into account in the assessments, why it is required and that there is consistency across the application documents. But the flexibility assumes an *outer* shell parameter *inside of which* the "development" proposed may occur (and be evaluated within rational parameters (as in, "within" parameters as stated in the *Smith* case[1])) and not a shell that extends iteratively in three dimensions outside of which development may occur (so as to extend the three dimensional parameters of the Order limits at the same time). On the face of it, that latter approach is an "abuse" under Advice Note 9.

11. In the context of LVIA the approach should be to clearly identify the outer extent of the Rochdale Envelope on the visualisations and photomontages, which has not been done in this case. Such an approach would enable a better understanding of worst case impacts and design mitigation accordingly.

12. An example of the legally correct and *lawful* approach to evaluation (by photomontages) mentioned above was taken in the recently consented Norfolk Vanguard DCO. The starting point was the Project Description Chapter 5 (**Appendix 1** of this note) which identified the onshore key *parameters* of the proposed converter station and identified the height of the *tallest* structure inside of the Envelope: these were lightning protection masts (each a

[1] *Paragraph 33: "The decision maker is not however entitled to leave the assessment of likely impact to a future occasion simply because he contemplates that the future decision maker will act competently. Constraints must be placed on the planning permission within which future details can be worked out, and the decision maker must form a view about the likely details and their impact on the environment."*

development) and their incorporation into the converter station area design was set out in the Lightning Protection Masts Information Sheet with the Converter Station situated below their height within the Envelope (see **Appendix 2** of this note). Those tallest structures established the highest part of the parameter volume *inside of which* the rest of the evaluated development could occur in detail.

13. The LVIA Chapter 29 (**Appendix 3** of this response) *then* between paragraphs 48 and 59 clearly set out the methodology explaining the *Rochdale* Envelope approach and Advice Note 9 "*clearly defined parameters*". The *Smith* case, paragraphs 33 and 34, reinforces in law that the parameters are "*within which*" the details must evolve and not "*outside of which*" it may occur. At the end of that clear explanation paragraph 59 referred to Figures 29.13 to 29.24, being the photomontages. That is, the LVIA evaluated the "reasonable worst-case" by taking the *outer* Envelope parameter as the evaluated development envelope and not the Converter Station volume that was a smaller volume.

14. Those Figures 29.13 to 29.24 (**Appendix 4** of this response) impose the computer generated *Rochdale* Envelope extent onto the landscape photographs (represented by blue dashed/dotted lines) in order to clearly show the maximum limits of the proposals *within* that Envelope. There is no legend on the photographs but the document is headed by a section setting out the 'methodology statement for visualisations'. Paragraph 3 of that confirms as follows:

> " '*The Project Design Envelope', explains how the project EIA will be based on the 'Rochdale Envelope' approach, as supported by The Planning Inspectorate Advice Note Nine (The Planning Inspectorate, 2012). The Rochdale Envelope presents the parameters of the project which represent the worst-case scenario. This ensures the DCO application covers the maximum possible extent of the project.* ***Visualisations in Figures 29.13 to 29.24 therefore present a Rochdale Envelope approach, marked by a blue dashed 3D box around the computer-generated model, indicating the maximum possible extent of the project****. This* ***ensures*** *that the LVIA considers the worst case scenario in respect of* ***both the National Grid substation extension and the onshore project substation***" (emphasis added).

15. In this way the conclusions of the VIA and EIA and subsequent mitigation proposals are robustly identified and designed and would avoid the degree of opacity in proposals as shown by the Applicant's latest attempts to extend the parameters of the development proposals.

16. However, and by contrast, the Application envelope has evaluated the Options B(i) and B(ii) Envelopes but the proposed masts appear tall development than the top of each box. In

addition, the suggestion of including the “extension” to the existing sub-station (itself subject to EIA) as such development, cannot presently fit inside those Envelopes because they do not extend far enough eastwards so as to encompass that envisaged extension development.

ExA WQ 2 (ref: LV2.9.2) Comments: Appendix 1

Vanguard Environmental Statement: Chapter 5 Project Description

Royal HaskoningDHV
Enhancing Society Together

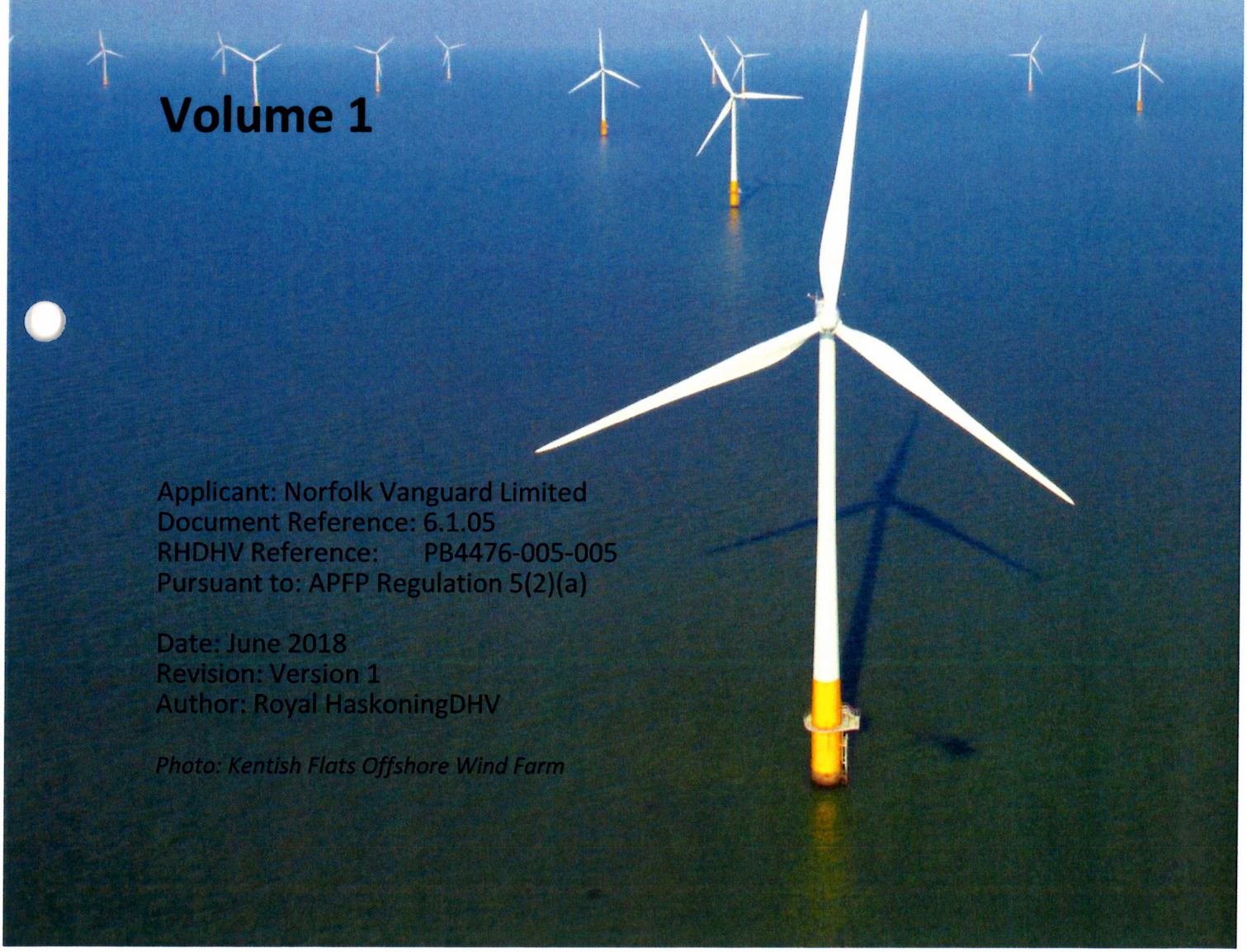
VATTENFALL

Norfolk Vanguard Offshore Wind Farm

Chapter 5
Project Description

Environmental Statement

Volume 1



Applicant: Norfolk Vanguard Limited
Document Reference: 6.1.05
RHDHV Reference: PB4476-005-005
Pursuant to: APFP Regulation 5(2)(a)

Date: June 2018
Revision: Version 1
Author: Royal HaskoningDHV

Photo: Kentish Flats Offshore Wind Farm

5 PROJECT DESCRIPTION

5.1 Introduction

1. This chapter of the Norfolk Vanguard Environmental Statement (ES) provides a full description of the components required for construction, operation, maintenance and decommissioning of Norfolk Vanguard offshore wind farm and includes a consideration of the methods used for installation, maintenance and decommissioning.

2. As outlined in Chapter 1 Introduction and detailed throughout this chapter, the offshore wind farm (OWF) comprises two distinct areas, Norfolk Vanguard East (NV East) and Norfolk Vanguard West (NV West) ('the OWF sites'). The offshore wind farm would be connected to the shore by offshore export cables installed within the offshore cable corridor from the wind farm to a landfall point at Happisburgh South, Norfolk. From there, onshore cables would transport power over approximately 60km to the onshore project substation at Necton, Norfolk.

3. Once built, Norfolk Vanguard would have an export capacity of up to 1800MW, with the offshore components comprising:

   - Wind turbines;
   - Offshore electrical platforms;
   - Accommodation platforms;
   - Met masts;
   - Measuring equipment (LiDAR and wave buoys);
   - Array cables;
   - Interconnector cables; and
   - Export cables.

4. The key onshore components of the project are as follows:

   - Landfall;
   - Onshore cable route, accesses, trenchless crossing technique (e.g. Horizontal Directional Drilling (HDD)) zones and mobilisation areas;
   - Onshore project substation; and
   - Extension to the Necton National Grid substation and overhead line modifications.

5. Vattenfall Wind Power Ltd (parent company of Norfolk Vanguard Limited), through one of its subsidiaries, is also developing Norfolk Boreas, a 'sister project' to Norfolk Vanguard. Norfolk Boreas would share a grid connection location and also much of the offshore and onshore cable corridors with Norfolk Vanguard. Therefore, in order to minimise impacts, Norfolk Vanguard Limited will include within its Development

5.5.2.7 Key parameters

335. Table 5.32 summarises the onshore cable route key parameters with Table 5.33 summarising the joint pit key parameters.

Table 5.32 Summary of onshore cable route key parameters

Element	Minimum	Maximum	Additional information
Number of cable trenches	2	4	Norfolk Vanguard and Norfolk Boreas duct installation
Width of cable trench (m)	1	5	Maximum considers two adjacent trenches are excavated as a single trench rather than as two separate trenches of 1m
Length of cable Route (km)		60	Approximate
Cable Diameter (mm)	100	150	
Type of cable	XLPE or MIND electrical cables, plus fibre optics		
Voltage (kV)	320	500	
Temporary strip width (m)	35	45	Duct installation would cover up to 45m in width to facilitate future installation of onshore cables for Norfolk Boreas (see Plate 5.15)
Permanent strip width (m)	13	20	Permanent strip would cover up to 20m in width to accommodate Norfolk Vanguard and Norfolk Boreas.
Burial depth (m)	1.05	-	1.05m 'normal' agricultural, 1.2m 'deep ploughing' agricultural to top of duct target. Up to 20m at trenchless crossings.

Table 5.33 Summary of joint pit key parameters

Element	Minimum	Maximum	Comments
Number of cable circuits	2	2	Separate jointing pits are required for each cable circuit (Norfolk Boreas joint pits not included in Norfolk Vanguard DCO).
Width (m)	3	6	
Length (m)	10	15	
Depth (m)	1.5	2	
Nominal distance between jointing pits (m)	500	1000	Actual distance dependant on existing infrastructure along the cable route, cable specification and cable delivery limitations. Typically 800m.

5.5.2.8 Operations and Maintenance

336. There is no ongoing requirement for regular maintenance of the onshore cables following installation, however access to the onshore cable route would be required to conduct emergency repairs, if necessary. Access to each field parcel along the

to provide compliance with the technical requirements of the National Grid and allow safe operation of the Norfolk Vanguard connection.

376. The onshore project substation will consist of two similar converter stations, each having a power transfer capability of between 800MW and 1000MW. As such, in the worst case scenario the onshore project substation will consist of:

- 2x converter buildings - housing DC filter equipment and power electronics to convert HVDC to HVAC power for connection to National Grid;
- 2x outdoor HVAC compounds – each compound will contain one or more 400kV transformers, plus HVAC filters, busbars and cable sealing ends;
- Control building – housing SCADA and protection equipment;
- Access roads – for operation and maintenance access to equipment; and
- Associated connections between equipment via overhead busbar and cabling, including buried earthing system.

377. The largest equipment within the onshore project substation will be the converter halls with an approximate height of 19m. The tallest structure at the onshore project substation site will be the lightning protection masts at a height of 25m. All other equipment will not exceed a height of 13m. The total land requirement for the onshore project substation to the perimeter fence is 250m x 300m.

378. Table 5.34 summarises the onshore project substation key parameters.

Table 5.34 Onshore project substation key parameters summary

Element	Maximum	Comments
Length of site (m)	300	
Width of site (m)	250	
Tallest Structure (m)	25	Lightening protection masts
Tallest building (m)	19	Converter hall
Fence Height (m)	2.4 + 1.0	Palisade fence + electrical pulse fencing

5.5.5.2 Location

379. The onshore project substation is proposed to be located within the footprint illustrated in Figure 5.5. A detailed site selection process (described in Chapter 4 Site Selection and Assessment of Alternatives) has been undertaken to determine a suitable location. Siting of the onshore project substation has had due consideration to avoid existing watercourses, hedgerows and other known infrastructure/ constraints to minimise impacts. Consideration has also been given to the potential siting of equivalent onshore project substation for Norfolk Boreas for cumulative assessment purposes.

ExA WQ 2 (ref: LV2.9.2) Comments: Appendix 2

Vanguard Lightning Protection Masts Information Sheet

Royal HaskoningDHV
Enhancing Society Together

VATTENFALL

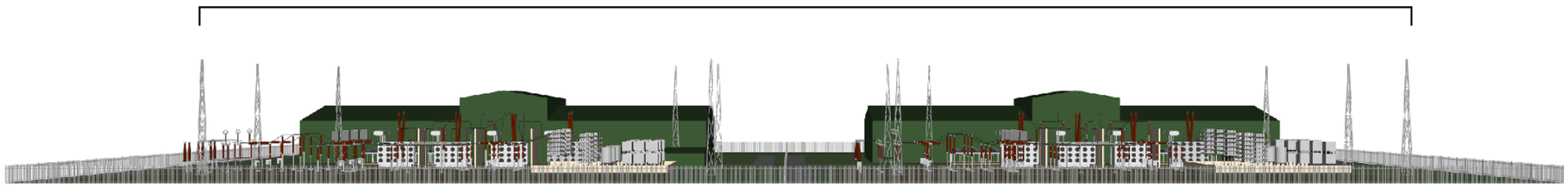
Norfolk Vanguard Offshore Wind Farm

Lightning Protection Masts Information Sheet

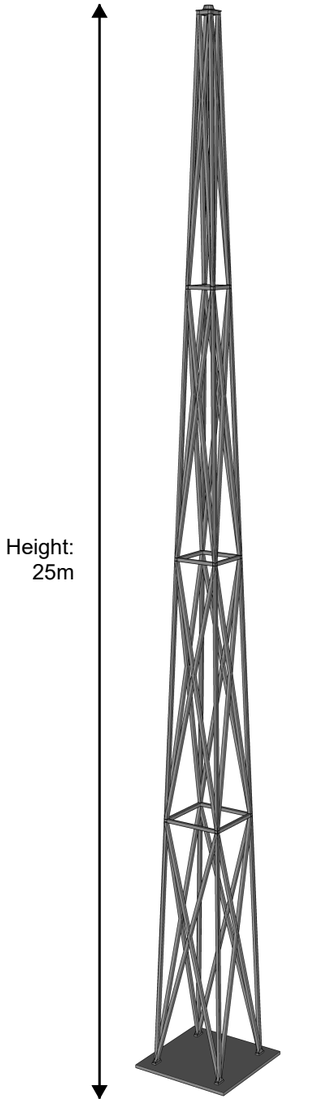
Applicant: Norfolk Vanguard Limited
Document Reference: ExA; ISH; 10.D3.1F
Deadline 3

Date: February 2019

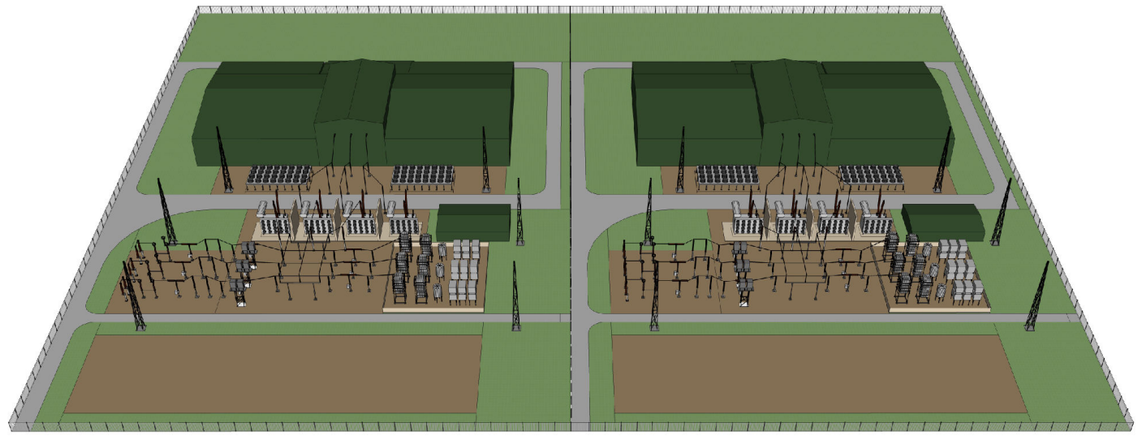
Photo: Kentish Flats Offshore Wind Farm



HVDC Substation Front View



Lighting Protection Mast



HVDC Substation Oblique View

Sourced from ABB based on East Anglia 1 HVDC substation design.

Project: Norfolk Vanguard	Report: Examination: For Information Only

Title:

ExA; ISH; 10.D3.1F
Lighting Protection Masts
Information Sheet

Figure: n/a | Drawing No: ExA; ISH; 10.D3.1F

Revision:	Date:	Drawn:	Checked:	Size:	
01	11/02/2019	LA	JP	A3	
02	12/02/2019	LA	JP	A3	

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Enhancing Society Together

ExA WQ 2 (ref: LV2.9.2) Comments: Appendix 3

Vanguard Environmental Statement: Chapter 29 Landscape and Visual Impact Assessment

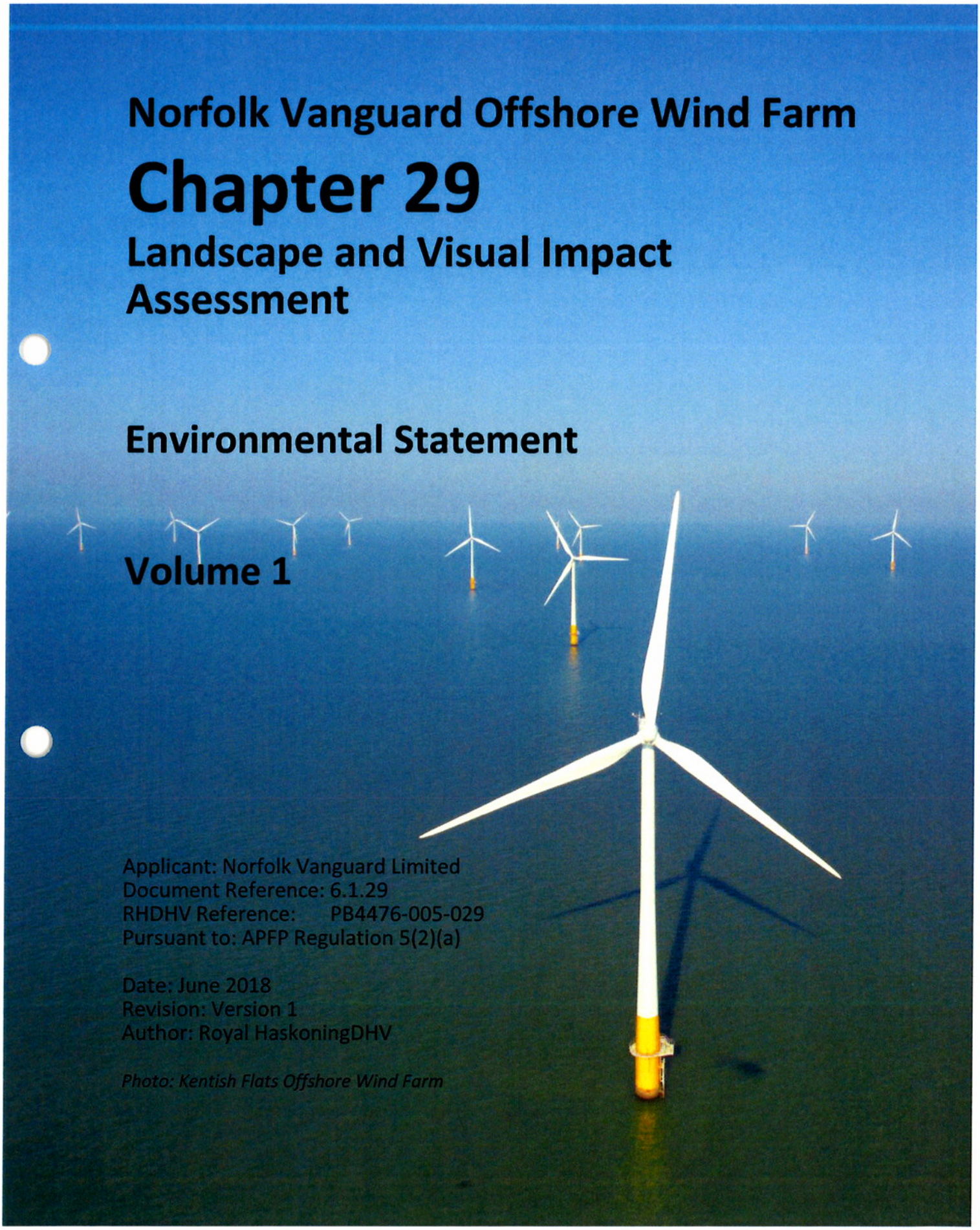
Norfolk Vanguard Offshore Wind Farm

Chapter 29

Landscape and Visual Impact Assessment

Environmental Statement

Volume 1



Applicant: Norfolk Vanguard Limited
Document Reference: 6.1.29
RHDHV Reference: PB4476-005-029
Pursuant to: APFP Regulation 5(2)(a)

Date: June 2018
Revision: Version 1
Author: Royal HaskoningDHV

Photo: Kentish Flats Offshore Wind Farm

48. Chapter 6 EIA Methodology Section 6.4, 'The Project Design Envelope', explains how the project EIA will be based on the 'Rochdale Envelope' approach, as supported by The Planning Inspectorate Advice Note Nine (The Planning Inspectorate, 2012). The Rochdale Envelope presents the parameters of the project which represent the worst-case scenario. This ensures the DCO application covers the maximum possible extent of the project. Visualisations in Figures 29.13 to 29.24 therefore present a Rochdale Envelope approach, marked by a blue dashed 3D box around the computer-generated model, indicating the maximum possible extent of the project. This ensures that the LVIA considers the worst case scenario in respect of both the National Grid substation extension and the onshore project substation.

49. The design of the National Grid substation extension is represented by a computer-generated model indicating the worst case scenario, set within the parameters of the Rochdale Envelope. This ensures that if any modifications to the design are made, these will occur within the worst case scenario assessed.

50. The design of the onshore project substation will be further developed within the parameters set by the Rochdale Envelope. The computer-generated model included in the visualisations provides an indicative representation of the worst case scenario within the Rochdale Envelope and this has formed the basis of the LVIA. Those aspects of the design that would not change include the footprint of the development (250m x 300m), the maximum height of the buildings (19m), the maximum height of the lightning protection masts (25m) and the general infrastructure of indoor converter halls and outdoor electrical infrastructure. The computer-generated model has been included in the photomontages to give an impression of the general appearance and character of the onshore project substation, set within the parameters of the Rochdale envelope.

51. Visualisations of energy developments have a number of limitations when using them to form a judgement on the effects of this type of development. These include:

- A visualisation can never show exactly what the energy development will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;
- The images give a reasonable impression of the scale of the energy developments and the distance from the viewpoint and, whilst they have been produced to accord with best practice guidance, can never be 100% accurate;
- The viewpoints illustrated are representative of views in the area, but cannot represent visibility at all locations;
- To form the best impression of the impacts of the development these images are best viewed in the field at the viewpoint location shown; and

- The visualisations must be printed at the right size to be viewed properly (A1 width) and viewed at a comfortable viewing distance.

52. The photographs used to produce the photomontages have been taken using Canon EOS 5D and 6D Digital SLR cameras, with a fixed lens and a full-frame (35mm negative size) CMOS sensor. The photographs are taken on a tripod with a pano-head at a height of approximately 1.5m above ground.

53. To create the baseline panorama, the frames are individually cylindrically-projected and then digitally joined to create a fully cylindrically-projected panorama using Adobe Photoshop or PTGui software. This process avoids the wide-angle effect that would result should these frames be arranged in a perspective projection, whereby the image is not faceted to allow for the cylindrical nature of the full 360-degree view but appears essentially as a flat plane. These should be viewed flat at a comfortable arm's length. These images are each printed on paper 841 x 297 mm (half A1), which provides for a relatively large-scale image.

54. Tonal alterations are made using Adobe software to create an even range of tones across the photographs once joined.

55. 3D model views that illustrate the onshore project substation and National Grid substation extension within a computer-generated image of the landform are used in the assessment to present an indicative appearance of the project. These are produced with Visual Nature Studio software and are based on the OS Terrain 5 digital terrain model with a 5m data grid (OS Terrain 5). There are limitations in the accuracy of DTM data so that finer elements of landform may not be picked up precisely and may result in parts of the onshore project substation or National Grid substation extension, being more or less visible than is shown, however, the use of OS Terrain 5 minimises these limitations. Where descriptions within the assessment identify the extent of onshore infrastructure visible this refers to the illustrations generated and therefore the reality may differ to a degree from these impressions. The modifications to the overhead line, which include an additional tower and an incremental change in the location and height of another tower, are included in the ES photomontages.

56. Photomontages have been produced for all the representative viewpoints, using Adobe Photoshop software, to provide a realistic image of the appearance of the proposal. For most views, these include the introduction of the onshore project substation and National Grid substation extension only, as these are the elements that create the greatest change in views and are likely to be most visible from the surrounding area. The location and scale of the computer-generated model has been verified using markers such as the existing transmission towers, the existing substations, church towers and other fixed built features in the landscape.

57. The photographs and photomontages used in this assessment are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.

58. GPS readings and accurate aerial photography have been used to verify viewpoint locations and markers within the OS terrain model, which is referenced to the OS British National Grid co-ordinate system.

59. In respect of the onshore project substation and National Grid substation extension, there are twelve representative viewpoints shown in Figures 29.13 to 29.24. Viewpoints 1 to 8 were agreed with Statutory Consultees involved in the LVIA (ETG) Meetings, while Viewpoints 9 to 12 were added in response to comments raised at these meetings. The figures for each viewpoint show the following;

- Location map of the viewpoint, baseline photograph and computer-generated model;
- Photomontage of Norfolk Vanguard onshore project substation, National Grid substation extension and overhead line modifications;
- Photomontage of Norfolk Vanguard onshore project substation, National Grid substation extension overhead line modifications and mitigation planting;
- Photomontage of Norfolk Vanguard onshore project substation, and National Grid substation extension, Norfolk Boreas onshore project substation and National Grid substation extension, and overhead line modifications; and
- Photomontage of Norfolk Vanguard onshore project substation and National Grid substation extension, Norfolk Boreas onshore project substation and National Grid substation extension, overhead line modifications, and with mitigation planting for both projects.

29.5.4.3 Public access

60. The assessment has been carried out from publicly accessible areas. In instances where parts of these areas have been inaccessible, other sources of information have been used and professional judgement has been applied in the interpretation of these sources. For example, where sections of the busy A47 have been inaccessible owing to the health and safety risks, then stopping places nearby have been used in order to gain a similar experience and the assessment has been supplemented through the use of Google Earth to better understand the experience from the road.

ExA WQ 2 (ref: LV2.9.2) Comments: Appendix 4

Vanguard Environmental Statement: Visualisations Figures 29.13 to 29.24

Figure List

Methodology Statement for Visualisations

1. The viewpoint assessment is illustrated by a range of visualisations, including photographs and photomontages, which accord with SNH's Visual Representation of Wind Farms Version 2.2 (SNH, 2017). In the absence of detailed guidance on the production of photomontages for non-wind farm developments, the Landscape Institute (LI) in its Advice Note 01/11 makes the following comment:

   - "Scottish Natural Heritage's Visual representation of windfarms: good practice guidance states that the guidance may also be applicable to other forms of development or within other locations. The LI endorses this guidance and strongly advises members to follow this where applicable in preference to any other guidance or methodology."

2. Although the onshore elements of the project do not constitute a wind farm, the SNH guidance has been applied in the production of the photomontages. In PEIR, 90-degree field of view frames were presented for each viewpoint. However, through PEIR consultation and further site work, it has been agreed that 53.5-degree field of view frames would assist interpretation of the likely effects of the project and are more appropriate for the purposes of the assessment. The 53.5-degree field of view frames show an enlarged image of the development, which is considered more authentic in conveying the likely actual scale that would be experienced on site. A 90-degree baseline photograph frame has also been included to illustrate the wider context of the views experienced from each viewpoint.

3. Chapter 6 EIA Methodology Section 6.4, 'The Project Design Envelope', explains how the project EIA will be based on the 'Rochdale Envelope' approach, as supported by The Planning Inspectorate Advice Note Nine (The Planning Inspectorate, 2012). The Rochdale Envelope presents the parameters of the project which represent the worst-case scenario. This ensures the DCO application covers the maximum possible extent of the project. Visualisations in Figures 29.13 to 29.24 therefore present a Rochdale Envelope approach, marked by a blue dashed 3D box around the computer-generated model, indicating the maximum possible extent of the project. This ensures that the LVIA considers the worst case scenario in respect of both the National Grid substation extension and the onshore project substation.

4. The design of the National Grid substation extension is represented by a computer-generated model indicating the worse case scenario, set within the parameters of the Rochdale Envelope. This ensures that if any modifications to the design are made, these will occur within the worse case scenario assessed.

5. The design of the onshore project substation will be further developed within the parameters set by the Rochdale Envelope. The computer-generated model included in the visualisations provides an indicative representation of the worst case scenario within the Rochdale Envelope and this has formed the basis of the LVIA. Those aspects of the design that would not change include the footprint of the development (250m x 300m), the maximum height of the buildings (19m), the maximum height of the lightning protection masts (25m) and the general infrastructure of indoor converter halls and outdoor electrical infrastructure. The computer-generated model has been included in the photomontages to give an impression of the general appearance and character of the onshore project substation, set within the parameters of the Rochdale envelope.

6. Visualisations of energy developments have a number of limitations when using them to form a judgement on the effects of this type of development. These include:

   - A visualisation can never show exactly what the energy development will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;
   - The images give a reasonable impression of the scale of the energy developments and the distance from the viewpoint and, whilst they have been produced to accord with best practice guidance, can never be 100% accurate;
   - The viewpoints illustrated are representative of views in the area, but cannot represent visibility at all locations;
   - To form the best impression of the impacts of the development these images are best viewed in the field at the viewpoint location shown; and
   - The visualisations must be printed at the right size to be viewed properly (A1 width) and viewed at a comfortable viewing distance.

7. The photographs used to produce the photomontages have been taken using Canon EOS 5D and 6D Digital SLR cameras, with a fixed lens and a full-frame (35mm negative size) CMOS sensor. The photographs are taken on a tripod with a pano-head at a height of approximately 1.5m above ground.

8. To create the baseline panorama, the frames are individually cylindrically-projected and then digitally joined to create a fully cylindrically-projected panorama using Adobe Photoshop or PTGui software. This process avoids the wide-angle effect that would result should these frames be arranged in a perspective projection, whereby the image is not faceted to allow for the cylindrical nature of the full 360-degree view but appears essentially as a flat plane. These should be viewed flat at a comfortable arm's length. These images are each printed on paper 841 x 297 mm (half A1), which provides for a relatively large-scale image.

9. Tonal alterations are made using Adobe Photoshop software to create an even range of tones across the photographs once joined.

10. 3D model views that illustrate the onshore project substation and National Grid substation extension within a computer-generated image of the landform are used in the assessment to present an indicative appearance of the project. These are produced with Visual Nature Studio software and are based on the OS Terrain 5 digital terrain model. There are limitations in the accuracy of DTM data so that finer elements of landform may not be picked up precisely and may result in parts of the onshore project substation or National Grid substation extension, being more or less visible than is shown, however, the use of OS Terrain 5 minimises these limitations. Where descriptions within the assessment identify the extent of onshore infrastructure visible this refers to the illustrations generated and therefore the reality may differ to a degree from these impresions. The modifications to the overhead line, which include an incremental change in the location and height of one tower and the addition of another tower, are included in the ES photomontages.

11. Photomontages have been produced for all the representative viewpoints, using Adobe Photoshop software, to provide a realistic image of the appearance of the proposal. For most views, these include the introduction of the onshore project substation and National Grid substation extension only, as these are the elements that create the greatest change in views and are likely to be most visible from the surrounding area. The location and scale of the computer-generated model has been verified using markers such as the existing transmission towers, the existing substations, church towers and other fixed built features in the landscape.

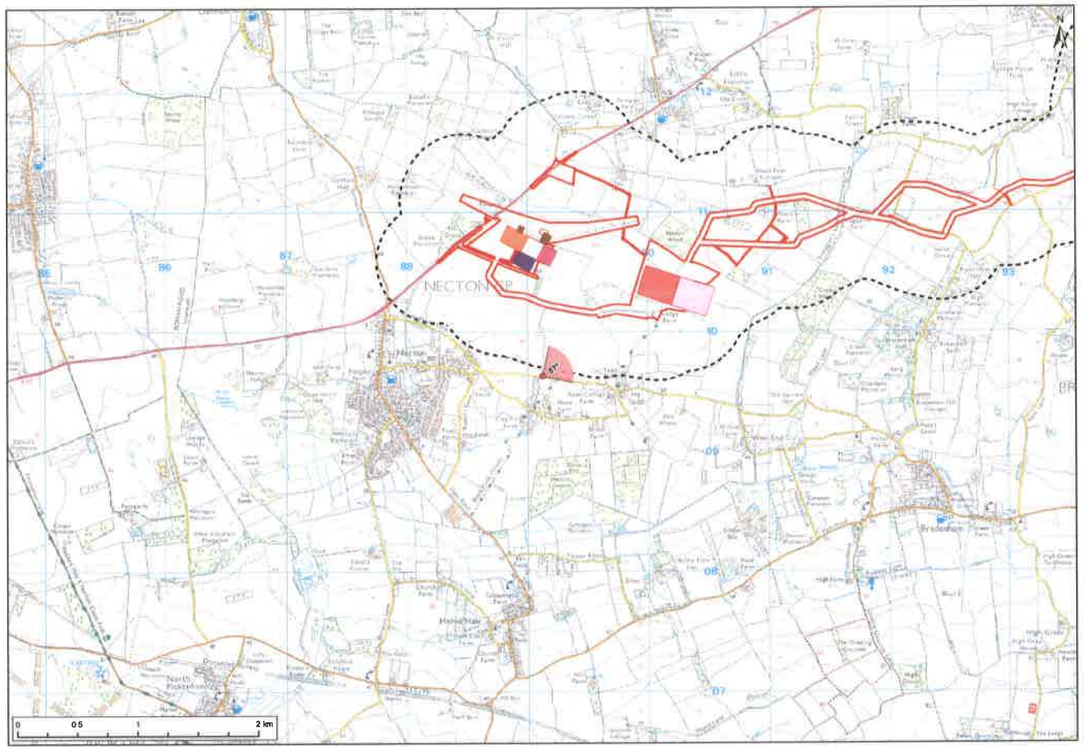
12. Each photomontage is presented on A1 width paper in planar projection with a 53.5 degree horizontal field of view and an image size of 260mm x 820mm. These should be viewed flat at a comfortable arms length.

13. The photographs and photomontages used in this assessment are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.

14. GPS readings and accurate aerial photography have been used to verify viewpoint locations and markers within the OS terrain model, which is referenced to the OS British National Grid coordinate system.

15. In respect of the onshore project substation and National Grid substation extension, there are twelve representative viewpoints shown in Figures 29.13 to 29.24. Viewpoints 1 to 8 were agreed with Statutory Consultees involved in the LVIA (ETG) Meetings, while Viewpoints 9 to 12 were added in response to coments raised at these meetings. The figures for each viewpoint show the following;

    (a) Location map of the viewpoint;
    (b) Baseline photograph and computer-generated model;
    (c) Photomontage of Norfolk Vanguard onshore project substation, National Grid substation extension and overhead line modifications;
    (d) Photomontage of Norfolk Vanguard onshore project substation, National Grid substation extension overhead line modifications and mitigation planting;
    (e) Photomontage of Norfolk Vanguard onshore project substation and National Grid substation extension, Norfolk Boreas onshore project substation and National Grid substation extension, over head line modifications; and
    (f) Photomontage of Norfolk Vanguard onshore project substation and National Grid substation extension, Norfolk Boreas onshore project substation and National Grid substation extension, over head line modifications, with miligation planting for both projects.



Viewpoint Location Plan Baseline Panorama (90 Degree View)
Scale: 1:25,000

Viewpoint Location Plan: 53.5 Degree View
Scale: 1:2,500

Legend:

- Norfolk Vanguard onshore red line boundary
- Study area 500m

Onshore project substation

- Onshore project substation

Norfolk Boreas

- Norfolk Boreas onshore project substation
- Norfolk Boreas National Grid substation extension

National Grid

- National Grid substation extension
- National Grid new / replacement overhead line tower

Existing substation locations

- Existing Necton substation
- Necton National Grid substation

Viewpoint

- 90 degree field of view viewpoint
- 53.5 degree field of view viewpoint

Project:	Report:
Norfolk Vanguard	Environmental Statement

Title:
Viewpoint 1:
Ivy Todd Road West

Figure: 29.13a | Drawing No: PB4476-004-029-013

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
04	15/05/2018	LA	JP	A3	Multiple
05	04/06/2018	LA	JP	A3	Multiple

Co-ordinate system: British National Grid | EPSG: 27700

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OS reference:	589120 E 309633 N	**Horizontal field of view:**	90° (cylindrical projection)	**Camera:**	Canon EOS 5D Mark II
Eye level:	60.5 m AOD	**Principal viewing distance:**	522 mm	**Lens:**	50mm (Canon EF 50mm f/1.4)
Direction of view:	57°			**Camera height:**	1.5 m AGL
Nearest substation:	1.04 km			**Date and time:**	25/01/2018, 12:22:35

Figure: 29.13b
Viewpoint 1: Ivy Todd Road West

Photomontage of the proposed Norfolk Vanguard HVDC Substation

OS reference:	589120 E 309633 N	**Horizontal field of view:**	53.5° (planar projection)	**Camera:**	Canon EOS 5D Mark II
Eye level:	60.5 m AOD	**Principal viewing distance:**	812.5 mm	**Lens:**	50mm (Canon EF 50mm f/1.4)
Direction of view:	57°	**Paper size:**	841 x 297 mm (half A1)	**Camera height:**	1.5 m AGL
Nearest substation:	1.04 km	**Correct printed image size:**	820 x 280 mm	**Date and time:**	25/01/2018, 12:22:35

Figure: 29.13c
Viewpoint 1: Ivy Todd Road West

OS reference:	589120 E 309633 N	**Horizontal field of view:**	53.5° (planar projection)	**Camera:**	Canon EOS 5D Mark II
Eye level:	60.5 m AOD	**Principal viewing distance:**	812.5 mm	**Lens:**	50mm (Canon EF 50mm f/1.4)
Direction of view:	57°	**Paper size:**	841 x 297 mm (half A1)	**Camera height:**	1.5 m AGL
Nearest substation:	1.04 km	**Correct printed image size:**	820 x 289 mm	**Date and time:**	25/01/2018, 12:22:35

Figure: 29.13d
Viewpoint 1: Ivy Todd Road West

OS reference:	589120 E 309633 N	**Horizontal field of view:**	53.5° (planar projection)	**Camera:**	Canon EOS 5D Mark II
Eye level:	60.5 m AOD	**Principal viewing distance:**	812.5 mm	**Lens:**	50mm (Canon EF 50mm f/1.4)
Direction of view:	57°	**Paper size:**	841 x 297 mm (half A1)	**Camera height:**	1.5 m AGL
Nearest substation:	1.04 km	**Correct printed image size:**	820 x 260 mm	**Date and time:**	25/01/2018, 12:22:35

Figure: 29.13e
Viewpoint 1: Ivy Todd Road West

Photomontage of the proposed Norfolk Vanguard and Norfolk Boreas HVDC Substations with mitigation planting

View flat at a comfortable arm's length

OS reference:	589120 E 309633 N	**Horizontal field of view:**	53.5° (planar projection)	**Camera:**	Canon EOS 5D Mark II
Eye level:	60.5 m AOD	**Principal viewing distance:**	812.5 mm	**Lens:**	50mm (Canon EF 50mm f/1.4)
Direction of view:	57°	**Paper size:**	841 x 297 mm (half A1)	**Camera height:**	1.5 m AGL
Nearest substation:	1.04 km	**Correct printed image size:**	820 x 260 mm	**Date and time:**	25/01/2018, 12:22:35

Figure: 29.13f
Viewpoint 1: Ivy Todd Road West