



Hornsea Project Four

Signposting document of responses to Mr and Mrs Taylor Deadline 3 Submission

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Glossary

Term	Definition
Export Cable Corridor (ECC)	The specific corridor of seabed (seaward of Mean High Water Springs (MHWS)) and land (landward of MHWS) from the Hornsea Project Four array area to the Creyke Beck National Grid substation, within which the export cables will be located.
Hornsea Project Four Offshore Wind Farm	The term covers all elements of the project (i.e. both the offshore and onshore). Hornsea Four infrastructure will include offshore generating stations (wind turbines), electrical export cables to landfall, and connection to the electricity transmission network. Hereafter referred to as Hornsea Four.
Onshore substation (OnSS)	Comprises a compound containing the electrical components for transforming the power supplied from Hornsea Project Four to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid. If a HVDC system is used the OnSS will also house equipment to convert the power from HVDC to HVAC.
Orsted Hornsea Project Four Ltd.	The Applicant for the proposed Hornsea Project Four Offshore Wind Farm Development Consent Order (DCO)
Trenchless Techniques	Also referred to as trenchless crossing techniques or trenchless methods. These techniques include Horizontal Directional Drilling (HDD), thrust boring, auger boring, and pipe ramming, which allow ducts to be installed under an obstruction without breaking open the ground and digging a trench

Acronyms

Term	Definition
COPFAS	Cottingham and Orchard Park Flood Alleviation Scheme (COPFAS)
DCO	Development Consent Order
ERYC	East Riding of Yorkshire Council (ERYC)
FRA	Flood Risk Assessment (FRA)
IAQM	Institute of Air Quality Management (IAQM)
oCoCP	Outline Code of Construction Practice (oCoCP)
oCTMP	outline Construction Traffic and Travel Management Plan (oCTMP)
OnSS	Onshore Substation (OnSS)
PRoW	Public Rights of Way (PRoW)

1 Introduction

- 1.1.1.1 During the Open Floor Hearing on Monday 11 April 2022, four actions were identified (as confirmed in [EV-007a](#)). Action 1 requested additional information be submitted by Mr and Mrs. Taylor in respect of surface water flooding. This information was submitted alongside other information, including speaking notes, at Deadline 3 ([REP3-059](#)).
- 1.1.1.2 Action 4 requested the Applicant to provide a specific signposted document, covering relevant parts of the Hornsea Four DCO application relevant to their Open Floor Hearing representation. [Table 1](#) sets out comments raised by Mr and Mrs. Taylor and provides a detailed response as well as signposting to the appropriate documents where commitments and approaches are secured.

Table 1: Responses to Comments Raised at Deadline 3.

Comment Raised at Deadline 3	Summary of Applicant's Response	Signposting to Relevant Submission Documents
<p>Flooding in Field No TAO 335 8605. Site of the converter stations.</p> <p>Situated on the East and North East boundaries is an area of low lying land of approximately 3 acres. With increasing Climate Change, now in Summer and Winter, after a period of heavy rain of one inch or less, it holds the water from the surrounding fields. It acts as an Attenuation Pond, this helps to prevent flooding towards Cottingham which was badly flooded in July of 2007. It works in a similar way to the several Attenuation Chambers constructed around the local area. My husband, who has farmed here all his working life knows this area has tended to flood each year. Several attempts to drain it were unsuccessful, so it was</p>	<p>An Onshore Infrastructure Flood Risk Assessment (FRA) was developed in consultation with the Environment Agency and Lead Local Flood Authority. All sources of flooding have been taken into consideration throughout the FRA when considering the siting and design requirements for the Hornsea Four Onshore Substation (OnSS).</p> <p>The Applicant has engaged with both the Environment Agency and Lead Local Flood Authority throughout the process, specifically with regard to flood risk issues at the OnSS, and they have confirmed there are no concerns related to the assessment of flood risk at the OnSS.</p> <p>The design would ensure that the OnSS would be elevated such that it would not be at risk from any source of flood risk, particularly fluvial or surface water flooding.</p> <p>The Onshore Infrastructure Drainage Strategy (Co19 of the Commitment Register) includes measures to limit discharge rates and attenuate flows to maintain greenfield runoff rates from the OnSS and therefore would not increase flood risk to neighbouring land.</p> <p>Appropriate flood risk mitigation measures at the OnSS are committed to, which is reflected in the following commitments (A4.5.2: Commitment Register (APP-050)):</p> <ul style="list-style-type: none"> • Co19: An Onshore Infrastructure Drainage Strategy will be developed for the permanent onshore operational development in accordance with the Outline Onshore Infrastructure Drainage Strategy. The Onshore Infrastructure Drainage Strategy will include measures to ensure that existing land drainage is reinstated and/or maintained. This will include measures to limit discharge rates and attenuate flows to maintain greenfield run-off rates at the Onshore Substation. The Onshore Infrastructure Drainage Strategy will be developed in line with the latest relevant drainage guidance notes in consultation with the Environment Agency, Lead Local Flood Authority, and relevant Internal Drainage Board as appropriate. • Co184: Where the permanent access track to the OnSS may be required to pass over an existing watercourse, the crossing will be appropriately designed to maintain floodplain capacity and/or flow conveyance, where reasonably practicable. This shall include an allowance for the predicted effects of climate change. 	<p>A6.2.2: Onshore Infrastructure Flood Risk Assessment (APP-098)</p> <p>A4.5.2: Commitment Register (APP-050)</p> <p>A6.2.2: Onshore Infrastructure Flood Risk Assessment (APP-098) B1.1.1 Consultation Report - Volume B1 - Annex 1.1: Evidence Plan (APP-130)</p> <p>F2.6 Volume F2.6: Outline Onshore Infrastructure Drainage Strategy (APP-241)</p> <p>A4.5.2: Commitment Register (APP-050)</p>

Comment Raised at Deadline 3	Summary of Applicant's Response	Signposting to Relevant Submission Documents
<p>sown with grass. A plan and photos taken in Nov 2019 will be forwarded.</p>	<ul style="list-style-type: none"> Co185: Where the permanent access track to the OnSS is within areas of flood risk (as shown on the Environment Agency Flood Map for Planning) it will be appropriately designed to maintain existing ground elevations to ensure continued floodplain capacity and/or flow conveyance, where reasonably practicable. Co191: The drainage design at the onshore substation will include Sustainable Drainage System (SuDS) measures including filter drains, swales, attenuation and flow control structures for the operational drainage of the Onshore Substation. Surface water will be discharged from the site at a controlled rate which will be determined during the detailed design stage. Appropriate consideration will be given to maintaining the existing floodplain capacity and / or flow conveyance during extreme rainfall events. These principles are provided in the Outline Onshore Infrastructure Drainage Strategy with which the Onshore Infrastructure Drainage Strategy will be developed. <p>Furthermore, the Onshore Infrastructure Drainage Strategy will be developed in line with the latest relevant drainage guidance notes in consultation with the Environment Agency, the Lead Local Flood Authority, and relevant Internal Drainage Board, as appropriate. This is secured via Requirements 13 and 15 of the draft DCO which adequately secures the flood mitigation measures.</p> <p>The Applicant notes the reference to surface water flooding in the north-east corner of Field No TAO 335 8605. The Applicant confirms that surface water flooding at the OnSS, including in this location, has been considered within A6.2.2: Onshore Infrastructure FRA (APP-098). Figure 18 of the A6.2.2: Onshore Infrastructure FRA (APP-098) (also included as Figure 1 below) highlights this corner of the field as comprising a known historical flooding location. This is further confirmed by the surface water mapping reproduced on Figure 19 of the A6.2.2: Onshore Infrastructure FRA (APP-098) (also included as Figure 2 below), which shows this lower-lying area of the field as being at increased surface water flood risk.</p> <p>As part of the A6.2.2: Onshore Infrastructure FRA (APP-098), the assessment considered potential flood risk to Hornsea Four as well as the potential impact to off-site receptors. With regard to surface water flooding, Section 2.10 of the A6.2.2: Onshore Infrastructure FRA (APP-098) provides a summary of key actions undertaken by East Riding of Yorkshire Council (ERYC) following the flooding in July 2007,</p>	

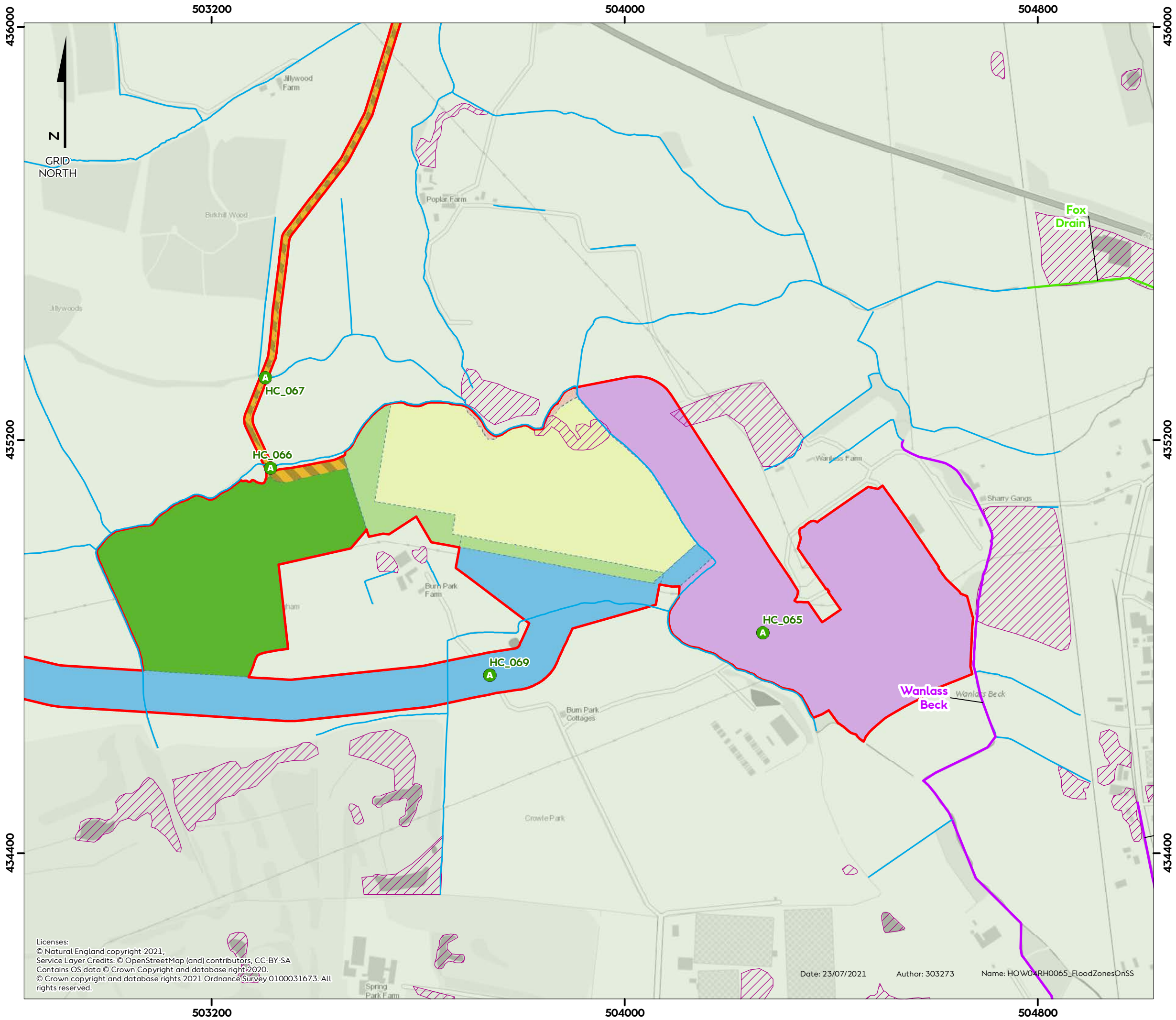
Comment Raised at Deadline 3	Summary of Applicant's Response	Signposting to Relevant Submission Documents
	<p>including the development of the Cottingham and Orchard Park Flood Alleviation Scheme (COPFAS). As part of the assessment for Hornsea Four, a review of the modelling undertaken for the COPFAS study was carried out and the flood risk in the context of the OnSS discussed with ERYC at a meeting on 15 May 2020 (ON-HYD-7.1 within B1.1.1 Consultation Report - Volume B1 - Annex 1.1: Evidence Plan). It was concluded that the COPFAS will provide limited benefit to the OnSS location; however, by attenuating surface water at various points it reduces flooding downstream.</p> <p>With regard to the surface water ponding in the north-east corner it is confirmed that this is within the area identified for the development of the OnSS. As noted in F2.6 Volume F2.6: Outline Onshore Infrastructure Drainage Strategy (APP-241) the drainage design at the OnSS will include Sustainable Drainage System (SuDS) measures, surface water will be discharged from the site at a controlled rate (to maintain greenfield runoff rates) and appropriate consideration will be given to maintaining the existing floodplain capacity and / or flow conveyance during extreme rainfall events. This has been included as Co19 and Co191 of A4.5.2: Commitment Register (APP-050) (as detailed in above in this response).</p> <p>As such, the Applicant can confirm that the existing surface water flood risk in this location has been considered in A6.2.2: Onshore Infrastructure FRA (APP-098), both in the context of flood risk to the OnSS as well as any potential off-site impact. The Applicant has committed to include appropriate measures to ensure surface water can be attenuated within the site and discharged at an appropriate rate, thereby ensuring there is no increased risk as a result of Hornsea Four. The surface water drainage requirements will be provided in full in the detailed Surface Water Scheme (which is secured via DCO Requirement 15).</p> <p>On this basis, the Applicant considers that the above mitigation is sufficient to avoid significant impacts related to surface water flood risk arising from Hornsea Four.</p>	
<p>Field No TAO 334 4672</p> <p>Situated to the South, which is on the Cable Route, has Springs here which rise and flow following similar weather.</p>	<p>The Applicant notes the reference to the presence of springs in Field No TAO 334 4672. Both the potential for groundwater and surface water flooding at the OnSS and along the onshore ECC has been considered within A6.2.2: Onshore Infrastructure FRA (APP-098).</p> <p>Section 4.8.6 of A6.2.2: Onshore Infrastructure FRA (APP-098) noted the potential for groundwater emergence to occur around the OnSS. Further to this, Figure 19 of the A6.2.2: Onshore Infrastructure</p>	<p>A6.2.2: Onshore Infrastructure Flood Risk Assessment (APP-098)</p> <p>A4.5.2: Commitment Register (APP-050)</p>

Comment Raised at Deadline 3	Summary of Applicant's Response	Signposting to Relevant Submission Documents
	<p>FRA (APP-098) (also included as Figure 2 below) shows the potential for surface water flooding and / or flow paths within Field No TAO 334 4672.</p> <p>The potential surface water flooding or flow path in this location would only interact with the onshore ECC and, as such, once constructed all works would be located below ground. During construction, the Applicant has confirmed that drainage channels will be installed on either one or both sides of the onshore ECC to ensure that direct impacts to the hydraulic regime are not altered, to be developed in consultation with the Environment Agency and LLFA / IDB, as appropriate (Co19 of A4.5.2: Commitment Register (APP-050)).</p> <p>Therefore, it is concluded that there would be no impact on the above ground surface water flow path as a result of Hornsea Four.</p> <p>Furthermore, to ensure there is no impact on groundwater flow, Co13 of A4.5.2: Commitment Register (APP-050) provides a commitment that measures will be implemented to ensure that the cable trench does not become a conduit for groundwater flow. All such measures will be identified following consultation with the Environment Agency and will be reported within the CoCP (Co124).</p> <p>On this basis, the Applicant considers the above mitigation is sufficient to avoid significant impacts related to flood risk arising from Hornsea Four.</p>	
<p>Security of the OnSS access track from the A1079, i.e. gate at the entrance to prevent unauthorised entry.</p>	<p>The OnSS access road will form part of the construction site and as such it is a legal requirement to exclude unauthorised personnel from entering the site. Temporary security gates would be installed on the access road with sufficient set back to allow traffic to safely enter off the A1079 thus avoiding any congestion on the main highway. This access is the main point of entry for the OnSS works and would be manned 24/7 with a security guard and a gatehouse positioned at the gates to allow access to the site and restrict unauthorised entry. The type of gates, which will be confirmed within the detailed design, could be either steel or something as simple as an arm barrier that the guard will open to allow authorised entry to the site.</p> <p>During operation, there would be no need to have manned security on the gates and as such a different entry system would be installed to allow access to the substation for authorised personnel. Generally,</p>	<p>PRoW Outline Management Plan which forms appendix C of the Outline CoCP (F2.2: Outline Code of Construction Practice (APP-237))</p>

Comment Raised at Deadline 3	Summary of Applicant's Response	Signposting to Relevant Submission Documents
	<p>these gates would be electronic with either a keypad or phone number to contact for entry and would be more substantial than the temporary gates used for construction.</p> <p>Due to the complicated network of Public Rights of Way (PRoW) surrounding the OnSS, the impact of the stopping up of affected PRoWs has been reviewed to ensure minimum long-term impact to the wider PRoW network at the OnSS.</p>	
<p>Fire risk at the OnSS (including emergency vehicle access both into the OnSS but also evacuation for the Taylors if required in an emergency event).</p> <p>We feel the fire risk will increase due to the close proximity of the Converter Stations and other structures. Access for Emergency Vehicles could be difficult. In April 2013 a massive blaze at Creyke Beck sub-station, in which no-one was injured, meant that we were not allowed to leave the premises, the ponies panicked and had the wind direction changed, we and the ponies would have had to be evacuated.</p>	<p>Access for emergency vehicles in the event of an emergency will be permitted along the OnSS access road and it has been designed to accommodate this if required.</p> <p>Table 3 in G1.2: Environmental Risk Assessment of the Onshore Substation and Energy Balancing Infrastructure (AS-020) presents the environmental risk assessment, which includes consideration of both the likelihood of an accident occurring and the severity of any impact on named receptor categories (e.g. human, flora and fauna, watercourses, etc.).</p> <p>The worst case 'severity' of any residual impact is low (2), and low severity accords with a 'neutral' or 'slight' impact. Given that neither neutral nor slight impacts are significant in an Environmental Impact Assessment (EIA) context, following the incorporation of mitigation measures, none of the residual impacts from fire are determined to result in a likely significant effect. With generator sourced energy, an electrical fault will activate a suitable protective device that cuts off the energy source and even trips the generator/energy storage facility, with wind down energy diverted to dump loads. This is a well understood and mature system of control to protect people and the system.</p> <p>The risk management techniques that will be adhered to are presented in F2.12: Outline Energy Balancing Infrastructure HazID Report (APP-247) and include:</p> <ul style="list-style-type: none"> • Energy storage selection and layout; • Internal segregation of modules inside storage units; • Isolation of storage units within the facility; • External ancillary, monitoring, and switching equipment (remove spark and maintain control); • Remote Ventilation System; • Remote electrical isolation of facility; • Overcurrent detection and protection; and 	<p>G1.2: Environmental Risk Assessment of the Onshore Substation and Energy Balancing Infrastructure</p> <p>F2.12: Outline Energy Balancing Infrastructure HazID Report (APP-247)</p>

Comment Raised at Deadline 3	Summary of Applicant's Response	Signposting to Relevant Submission Documents
	<ul style="list-style-type: none"> Short circuit protection. <p>F2.12: Outline Energy Balancing Infrastructure HazID Report (REP2-029) secures the measures under Requirement 26 of the draft DCO.</p>	
<p>Noise, dust, vibration and light pollution to both the Taylor's property and their livestock (horses).</p> <p>The house which is mainly single glazed, the buildings and the surrounding pony paddocks will be subjected to noise, dust vibration and light pollution. Due to the very close proximity of the converter station construction work, the temporary working area and the cable route the entire are we occupy will be surrounded. Access is required 24/7.</p>	<p>The OnSS site selection process considered several environmental, technical, and commercial factors. This included both the proximity to the nearest residential receptors and settlements. The appraisal balanced the proximity of individual residential properties with proximity to larger clusters of properties, amongst other factors.</p> <p>The proximity to Burn Park Farm is acknowledged by the red rating for the identified site; however, considering all factors, on balance the site is considered to be the most appropriate within the OnSS search area. It is noted that necessary mitigation measures have been identified and secured for both construction and operational stages to reduce potentially significant environmental effects as far as practicable. In particular, the Outline Code of Construction Practice (oCoCP) (F2.2: Outline Code of Construction Practice (APP-237)) identifies (and secures) the mitigation measures to prevent effects arising from noise, dust, vibration, and light pollution, specifically:</p> <ul style="list-style-type: none"> Section 5.4 of the oCoCP details the lighting control measures which includes production of a Construction Lighting Plan which will ensure that any artificial light emitted from premises will not be prejudicial to health or be a nuisance as required by the Environmental Protection Act 1990; Section 6.8 of the oCoCP details the traffic and transport control measures which includes the outline Construction Traffic and Travel Management Plan (oCTMP) and commits to carry out construction works in such a way that maintains highway safety and avoids or minimises adverse effects on local communities and highway users; Section 6.9 of the oCoCP details the noise and vibration control measures including a commitment that construction works will be undertaken in accordance with the best practicable means (as defined in Section 72 of the Control of Pollution Act 1974), to minimise noise and vibration effects. Noise control measures will be consistent with the recommendations of the current version of BS 5228 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' - Part 1: Noise and Part 2: Vibration' (BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014), and that at locations where deemed 	<p>A4.3.3: Selection and Refinement of Onshore Infrastructure (APP-038)</p> <p>A3.8: Noise and Vibration (APP-032)</p> <p>A3.9: Air Quality (APP-033)</p> <p>A4.5.8: Health Impact Assessment (APP-056)</p> <p>F2.2: Outline Code of Construction Practice (APP-237)</p>

Comment Raised at Deadline 3	Summary of Applicant's Response	Signposting to Relevant Submission Documents
	<p>necessary (to be determined in consultation with ERYC and identified in the detailed CoCP(s)), screening and appropriate temporary noise barriers will be used; and</p> <ul style="list-style-type: none"> • Section 6.10 of the oCoCP details the air quality control measures and sets out that Dust mitigation management measures as detailed within Institute of Air Quality Management (IAQM) guidance (IAQM 2014) will be adopted near sensitive receptors: <ul style="list-style-type: none"> ○ Record all complaints and make the log available to the local authority when asked; ○ Undertake daily on and off-site inspections and record in a log; ○ Cover or fence stockpiles of dusty materials; ○ Remove any dusty materials from site as soon as possible; ○ Ensure vehicles turn off engines when not in use; ○ Ensure plant is fitted with appropriate dust suppression methods, or use these techniques in conjunction, where practicable; ○ Take measures to prevent material being tracked off-site by vehicles (e.g. road sweeper, wet sweeping methods); ○ Regularly inspect haul routes and make any repairs as necessary. Record in a log; and ○ A construction method statement relevant to management of dust will be submitted for approval to the relevant authority. <p>In respect of impacts on livestock and horses, specific consideration of livestock and horses is not typical in the EIA process. Assessments undertaken for the OnSS on human and ecological receptors sufficiently assess construction and operational impacts arising from Hornsea Four and secures necessary mitigation measures.</p> <p>The Applicant considers that this mitigation is sufficient to avoid significant effects arising from Hornsea Four.</p>	
<p>A vet's report regarding out ponies' welfare, which is of concern, will be forwarded.</p>	<p>Noted. The Applicant's position regarding livestock and horses is set out above.</p>	<p>N/A</p>



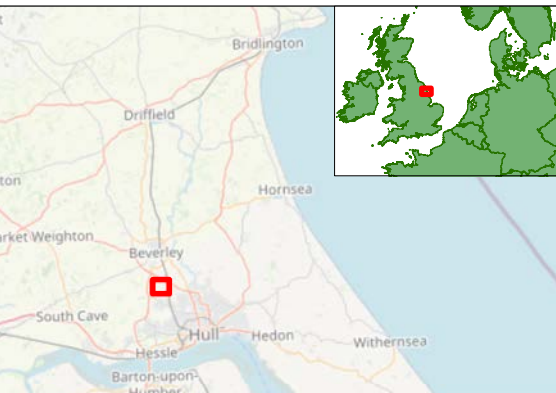
Hornsea Four

Figure 18

Onshore Substation Flood Zones

- Order Limits
- Onshore Export Cable Corridor
- Permanent Access Track
- Temporary Access Track
- Onshore Substation (Temporary Works)
- Attenuation Area
- Existing Landscaping
- Landscape Mitigation Area
- Substation Permanent Space
- Grid Connection Works
- Haul Road Crossing Access Point
- Main River
- IDB Maintained Watercourse
- Ordinary Watercourse
- Historic Flood Locations
- Environment Agency Flood Zones**
- Flood Zone 1
- Flood Zone 2
- WFD Operational Waterbody Catchments**
- Hull Lower

*All areas not shown as being located in either Flood Zone 2 or 3 are classed as Flood Zone 1 (when considering fluvial and tidal flood risk)



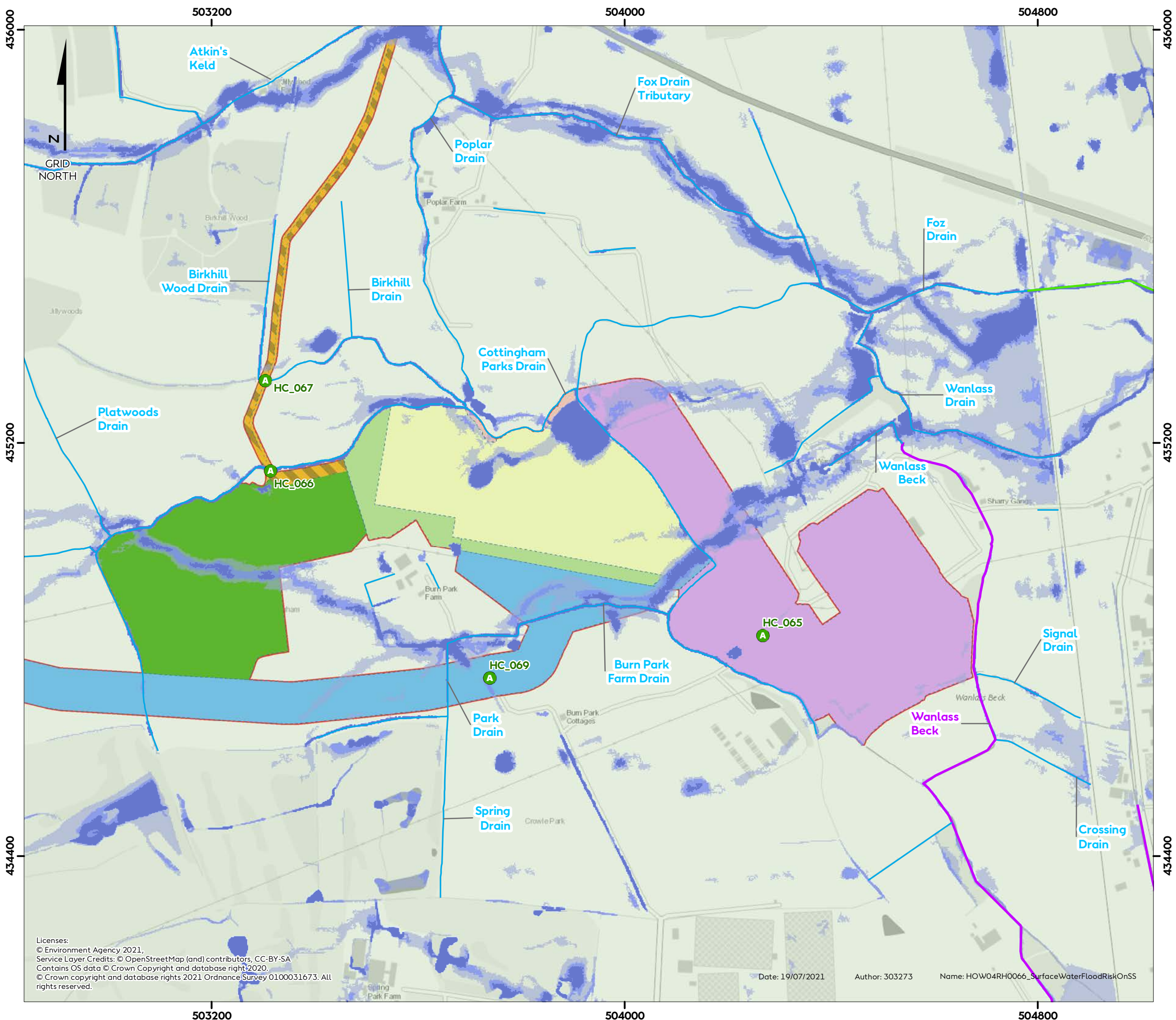
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 Scale@A3: 1:7,000
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 0 125 250 Yards

REV	REMARK	DATE
	First Issue for PEIR	03/07/2019
A	Updated following PEIR consultations, for DCO	23/07/2021

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Date: 23/07/2021 Author: 303273 Name: HOW04RH0065_FloodZonesOnSS

Title: Onshore Substation Flood Zones
 Document no: HOW04RH0065
 Created by: AZ
 Checked by: ID
 Approved by: CS

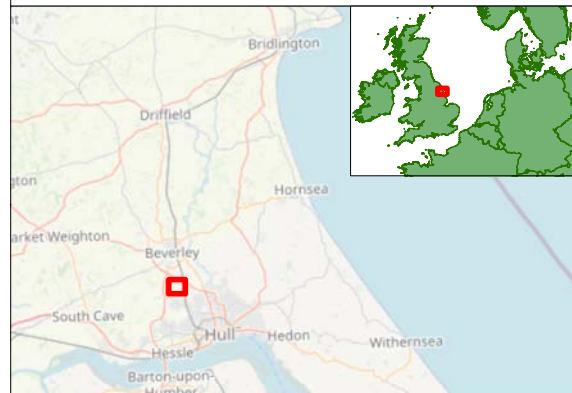


Hornsea Four

Figure 19

Onshore Substation Surface Water Flood Risk

- Order Limits
 - Onshore Export Cable Corridor
 - Permanent Access Track
 - Temporary Access Track
 - Onshore Substation (Temporary Works)
 - Attenuation Area
 - Existing Landscaping
 - Landscape Mitigation Area
 - Substation Permanent Space
 - Grid Connection Works
 - A Haul Road Crossing Access Point
 - Main River
 - IDB Maintained Watercourse
 - Ordinary Watercourse
- Environment Agency Flood Map for Surface Water**
- High Risk (Greater than 1 in 30 Annual Probability of Flooding)
 - Medium Risk (Between 1 in 100 and 1 in 30 Annual Probability of Flooding)
 - Low Risk (Between 1 in 1,000 and 1 in 100 Annual Probability of Flooding)
- WFD Operational Waterbody Catchments**
- Hull Lower




Coordinate system: British National Grid
 Scale@A3: 1:7,000

0 125 250 Metres

0 125 250 Yards

REV	REMARK	DATE
	First Issue for PEIR	29/05/2019
A	Updated following PEIR consultations, for DCO	19/07/2021

Title: Onshore Substation Surface Water Flood Risk
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 Created by: AZ
 Checked by: ID
 Approved by: CS



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