



Department
of Energy &
Climate Change

**RECORD OF THE HABITATS REGULATIONS ASSESSMENT UNDERTAKEN
UNDER REGULATION 61 OF THE CONSERVATION OF HABITATS AND
SPECIES REGULATIONS 2010 (AS AMENDED) FOR AN APPLICATION UNDER
THE PLANNING ACT 2008 (AS AMENDED)**

***Project Title:* North Killingholme Power Project**

***Date:* 7th September 2014**

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1 Introduction

Background

- 1.1 This is a record of the Habitats Regulation Assessment (HRA) that the Secretary of State (SoS) for Energy and Climate Change has undertaken under Regulation 61 of the Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitats Regulations) in respect of the Development Consent Order (DCO) and Deemed Marine Licence (DML) for the proposed North Killingholme Power Project and its associated infrastructure (the Project). For the purposes of these Regulations; the SoS is the competent authority for the Project application that has been submitted under the Planning Act 2008 regime (as amended).
- 1.2 C.GEN Killingholme Ltd (hereafter the Applicant) has applied to the Secretary of State for a DCO under Section 37 of the Planning Act 2008 (as amended) for the proposed North Killingholme Power Project. The Project application is described in more detail in Section 2.
- 1.3 In England and Wales, onshore energy generating stations greater than 50 MW constitute nationally significant infrastructure projects (NSIPs) and applications for development consent are subject to the requirements of the Planning Act 2008 (as amended).
- 1.4 The Project was accepted by the Planning Inspectorate (PINS) on 19th April 2013 and a three-member Panel of Inspectors (the Panel) was appointed as the Examining Authority (ExA) for the application. The examination of the Project application began on 12 September 2013 and was completed on 11 March 2014. The Panel submitted its report of the examination, including its recommendation (the Panel's Report), to the SoS on 11 June 2014.
- 1.5 The SoS conclusions on habitats and wild birds issues contained in this HRA report have been informed by the Panel's Report, and further information and analysis, including a Report on the Implications for European Sites (RIES) and written responses to it.

Habitats Regulation Assessment (HRA)

- 1.6 Council Directive 92/43/EC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) and Council Directive 2009/147/EC on the conservation of wild birds (the Birds Directive) aim to ensure the long-term survival of certain species and habitats by protecting them from adverse effects of plans and projects.
- 1.7 The Habitats Directive provides for the designation of sites for the protection of habitats and species of European importance. These sites are called Special Areas of Conservation (SACs). The Birds Directive provides for the classification of sites for the protection of rare and vulnerable birds and for regularly occurring migratory species. These sites are called Special Protection Areas (SPAs). SACs and SPAs are collectively termed European sites and form part of a network of protected sites across Europe. This network is called Natura 2000.

- 1.8 In the UK, the Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitats Regulations) transpose the Habitats and Birds Directives into national law as far as the 12 nm limit of territorial waters. The Convention on Wetlands of International Importance 1972 (the Ramsar Convention) provides for the listing of wetlands of international importance. These sites are called Ramsar sites. UK Government policy is to afford Ramsar sites the same protection as European sites.
- 1.9 Regulation 61 of the Habitats Regulations provides that:
- “.....before deciding to give consent, permission or other authorisation for, a plan or project which is likely to have a significant effect on a European site (either alone or in combination) and which is not directly connected with or necessary to the management of the site, the competent authority must make an appropriate assessment of the implications for the site in view of the site’s conservation objectives.”*
- 1.10 This project is not directly connected with, or necessary to, the management of a European site or a European marine site. However, it may affect European and Ramsar sites and so a Habitats Regulation Assessment (HRA) is required by Regulation 61.
- 1.11 The Habitats Regulations require that, where the project is likely to have a significant effect on any such site, an appropriate assessment (AA) is carried out to determine whether or not the project will adversely affect the integrity of the site in view of its Conservation Objectives. In this document, the assessments as to whether there are likely significant effects (LSEs), and, where required, the AAs, are collectively referred to as the HRA.
- 1.12 The HRA takes account of mitigation measures being secured, by requirements and conditions, within the DCO and DML.
- 1.13 In considering the possible impacts of the Project and in reaching his conclusions, the SoS has also taken into account duties and obligations provided for under the Conservation of Habitats and Species (Amendment) Regulations 2012, SI 2012 No. 1927, which came into force on 16th August 2012 and amend the Habitats Regulations. In particular, regulations 9(1) and 9A(1), (3) and (8) of the 2010 Regulations as inserted by regulation 8 of the 2012 Regulations are engaged when the SoS exercises his functions in relation to granting consent for a new electricity generating station and applies regulation 61(1). The key considerations in this context are securing compliance with the Habitats and Birds Directives; preserving, maintaining and re-establishing a sufficient diversity and area of habitat for wild birds in the United Kingdom; and using all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds.
- 1.14 This report should be read in conjunction with the following documents that provide extensive background information:
- Report on the Implications for European Sites proposed North Killingholme Power Project. An examining authority report prepared with the support of the environmental services team, 10th February 2014. – termed “the RIES”
 - Environmental Statement (the ES).
 - Applicant’s report to inform Habitats Regulations Assessment.

- Draft Development Consent Order dated 11 June 2014 (DCO).
- Statements of Common Ground between the Applicant and Natural England (V4.0) signed on 31 January 2014.
- Statements of Common Ground between the Applicant and Environment Agency signed on 5 November 2013.
- Statements of Common Ground between the Applicant and the Marine Management Organisation.
- Applicant's revised screening matrix summarising effects on European Sites by C.gen Killingholme Ltd, 27 November 2013.
- Natural England *comments on the Report on the Implications for European Sites 28th* February 2014.
- Environment Agency *comments on the Report on the Implications for European Sites 28th* February 2014.
- Written Representations of Natural England, 14 October 2013.
- First round of question responses from Environment Agency, 14 October 2013.
- First round of question responses from Natural England, 14 October 2013.
- First round of question responses from the Applicant (Habitats, Ecology and Nature conservation 1 of 2), 14 October 2013.
- Second round of question responses by Environment Agency, 7 January 2014
- Natural England comments on the Applicant's response to the ExA's second round of questions, 24 January 2014.
- Integrity Matrices provided by the Applicant in Response to the ExA's Rule 17 Request on 7 February 2014.
- Information from Natural England's letter to PINS in relation to Black-tailed Godwit, 10 February 2014.
- Second round written question responses from C.Gen Killingholme Ltd (Habitats, Ecology and Nature Conservation), Noise Compliance Appendices. Outline operational noise compliance methodology January 2014.
- Application for a new bespoke environmental permit from C.Gen Killingholme Ltd. Published 13th November 2013.
- Record of appropriate assessment under regulation 61 of the conservation of habitats and species regulations 2010 for an application under section 36 of the electricity act 1989. Heron renewable energy plant south Killingholme. May 2011.
- Relevant representation from the Lincolnshire Wildlife Trust Received on the 20th June 2013.

1.15 So far as is possible, the key information in these documents and written representations is summarised and referenced in this report.

The RIES and Statutory Consultation

- 1.16 Under Regulation 61(3) of the Habitats Regulations the competent authority must, for the purposes of an AA, consult the appropriate nature conservation body and have regard to any representation made by that body within such reasonable time as the authority specify.
- 1.17 The Panel, with support from the environmental services team of PINS, prepared a document entitled “Report on the implications for European Sites” RIES. The RIES was published on PINS planning portal website on 14th February 2014 for a period of 21 days for the purpose of regulation 61(3) consultation. At the time of publication, there were still a number of outstanding matters for agreement and clarification. . Written responses were received from Natural England (NE), Environment Agency (EA) and the Applicant. Within NE’s comments they update the planning inspectorate that since the RIES was issued new requirements 50 and 51 have been added to the DCO to control construction noise and visual attenuation of train movement at North Killingholme Haven Pits SSSI. They are therefore satisfied that with requirement 51 and 26 there will be no adverse effect on North Killingholme Haven Pits arising through construction of the conveyor belt. The EA notes that since the Environmental Permit application had not been duly made they were unable to issue a ‘letter of no impediment’ to the planning inspectorate. They confirm that their Environmental Permit determination will include an in-combination assessment of the development and other existing local emission sources.
- 1.18 This HRA refers to the matrices within the RIES. The RIES documents the information submitted and considered during the examination until the 14th February. This information and its matrices have been used to inform this report, supplemented by further written representations.

Relationship to other consents and licences / interdependencies

- 1.19 The DCO is not the only consent, licence or permit required to construct and operate the power station and its associated development. At the time of writing, some of these had been obtained, whilst decisions were still awaited on others such as the environmental permit. Key consents and licences that are required (in addition to the DCO) are summarised below and a brief description given of timings (where known), the competent authority and any relationship with the HRA and the DCO.
- Environmental Permit – EA – The Applicant submitted an application for a new bespoke Environmental Permit for the Project on the 15th November 2013. In response to the application, the EA requested further information in respect of deciding whether the application has been duly made. This application was subsequently duly made on the 10th March 2014.
 - Water Abstraction Licence – EA – this will be needed to abstract cooling water for the Project, different volumes would be needed depending on the scenario developed by the Applicant. The Applicant has not yet submitted an application for this licence.

- European Protected Species Licence – NE – the Applicant will decide if this is needed prior to commencement of development. These applications would follow updated ecological surveys undertaken in the season prior to development. NE has advised in particular that emergence surveys of bats from buildings to be demolished would need to be undertaken to adequately assess the potential impact on bats, and this is secured in the DCO by requirement (32(4)).

2 Project description

- 2.1 The DCO for the North Killingholme Power Project will authorise the Applicant to construct and operate a new electrical generating station and associated development on land adjacent to the C.RO Ports Killingholme Ltd Terminal at North Killingholme, North Lincolnshire.
- 2.2 The proposed development would have a capacity of up to 470 MW and operate either as a Combined Cycle Gas Turbine (“CCGT”) plant fired on natural gas or an Integrated Gasification Combined Cycle (“IGCC”) plant fuelled by solid fuels such as coal, petroleum coke or biomass. To allow the Generating Station to operate as an IGCC plant, gasification equipment would be constructed and full carbon capture and storage chain would need to be constructed and operational. This will need additional consent including an Environmental Permit from the EA.
- 2.3 When operating as a CCGT plant, the Generating Station would be fired on natural gas which would be obtained from existing high pressure gas supply networks in the area. When operating as an IGCC plant the Generating Station would be fuelled by coal (principally), possibly blended with, petroleum coke (petcoke) or biomass from which syngas will be produced to fuel the generating station. It may also operate on biomass alone in certain circumstances. The use of gasification technology will provide a great deal of flexibility with respect to the choice of fuels.
- 2.4 IGCC operation of the Generating Station, with carbon capture and storage, would take place when a solution for transporting and storing the captured CO₂ from the Generating Station is in place. Currently, a viable transport and storage system is not available. It is anticipated that, in due course, CO₂ transport infrastructure will become available through which captured CO₂ could be transported for storage in empty gas / oil fields or deep saline formations under the North Sea bed. A small proportion of the captured CO₂ could possibly be supplied to industry or other users, but the majority of the captured CO₂ would require transport and storage.
- 2.5 The land that would be utilised for carbon capture and storage is within the redline of the Applicant’s Project area. Additional information is provided by the Applicant in the Carbon Capture Ready Feasibility Study and Carbon Capture and Storage Design Concept Report. The overarching National Policy Statement for Energy EN-1 states that all commercial scale fossil fuelled generating stations have to be carbon capture ready and new coal-fired generating stations must have CCS on at least 300 MW net of the proposed generating capacity and secure arrangements for the transport and permanent storage of carbon dioxide.

- 2.6 The application Project area, covers approximately 286 hectares, which is predominately hardstanding. There are also two large ponds and areas of rough grassland/ scrub within the site. The site lies next to the Humber Estuary approximately 5 km north west of Immingham Docks. The development comprises of three main elements: the Principal Project Area (108 ha); the Electrical Grid Connection Land (93 ha); and the Gas Connection Land (85 ha). These are described below and shown on Figure 1 (see figure 2.1 of the ES). Full details of the infrastructure to be used in the Project are detailed in the schedules of the DCO.
- 2.7 The Applicant is proposing a number of different construction and operation scenarios for the Project. The Applicant is seeking flexibility to decide the scenario at a future date, this means they have had to consider the range of scenarios below within their Environmental Statement (ES):
- Scenario A – Construction of Power Island and Common Facilities only
 - Scenario B – Operation of Generating Station as a CCGT plant
 - Scenario C – Construction of Power Island with the Gasification Plant and Common Facilities
 - Scenario D – Operation of Generating Station as a CCGT plant with subsequent construction of the Gasification Plant
 - Scenario E – Operation of Generating Station as an IGCC plant
- 2.8 Development consent is not being sought for the gas and electric grid connections. These will be subject to a separate application to the Local Planning Authority. This will include a fresh assessment under the Habitats Regulations by the Local Planning Authority as a competent authority for the Habitats Directive.

Project stages

Construction

- 2.9 A programme of remediation across the operations area will need to be undertaken prior to construction. The Applicant states in the ES appendix 3.1 indicative construction programme that the overall construction period is anticipated to be about 36 months. This depends on the final construction programme and the final designs. The gasification plant which will take 36 months might occur in parallel with the construction of the Power Island and Common facilities which will take 26 months or follow commencement of its operations (ES, 3.8.1: 3.8.30 & 9.6.3). The fuel handling system would only take around 2 months to complete (ES, 3.8.16). The gas connection (ES, 3.8.26) will take approximately 18-24 months including commissioning.
- 2.10 The construction contractor will be required to submit and gain approval for a Construction Environmental Management Plan pursuant to Requirement 15 of the DCO. A piling method statement will need to be agreed with the Marine Management Organisation (MMO) as part of the deemed marine licence, to mitigate impacts on the Humber Estuary. Temporary acoustic hoardings will be erected between North Killingholme Haven Pits (NKHP) SSSI and the fuel conveyor which will be erected during construction (requirement 49). Hoarding or similar and a

lighting plan will be designed to reduce light spill from the construction works (RIES, 2.13; requirement 30).

Operation and Maintenance

- 2.11 The operational lifetime of the project will be approximately 30 years. Operations of the plant will run mainly on automated systems. There are a number of hazardous aspects including for example, the natural gas supply, oils, greases, cleaning substances, sewage effluent and a number of different chemicals (ES, 3.9.1: 3.9.37).
- 2.12 The operator will need to agree a written scheme for the management and mitigation of dust emissions as required by requirement 29 of the DCO. The designs for screening the cooling water intake to mitigate impacts on the estuarine ecology needs to be agreed with the MMO in accordance with the DML. A drainage scheme and operational noise control scheme also need to be agreed to minimise potential impacts from operating the power scheme under the DCO requirements. To mitigate impacts on the NKHP SSSI there will be a speed limit of 10 km/h to reduce noise impacts and a planting scheme to screen the Killingholme branch railway as it passes by the site (RIES, 2.13), in line with requirements 48 and 50.

Decommissioning

- 2.13 The ES states (3.10) that the anticipated operational lifetime is 30 years. A decision will be made at this point if it is appropriate to extend the life of the project. The project would need additional permits at this point to extend its operational life and ensure environmental performance in line with future legislative requirements. This would include a fresh assessment under the Habitats Regulations by the relevant authorities at that time.
- 2.14 Decommissioning will take place at the end of the Project lifetime and will involve the removal of buildings to ground level. All underground structures will either be left buried *in situ* or made safe. Project materials will be recycled as far as is practicable.
- 2.15 A full environmental departure audit will be carried out to examine and recommend remedial actions for all potential environmental risks (ES, 3.10.9). A site closure plan is needed as part of requirement 43 of the DCO. This plan will form part of the information needed for the site's Environmental Permit. Decommissioning will be undertaken in accordance with the Environmental Permit for the Project under the Environmental Permitting Regulations 2010.

3 Project location and designated sites

Location

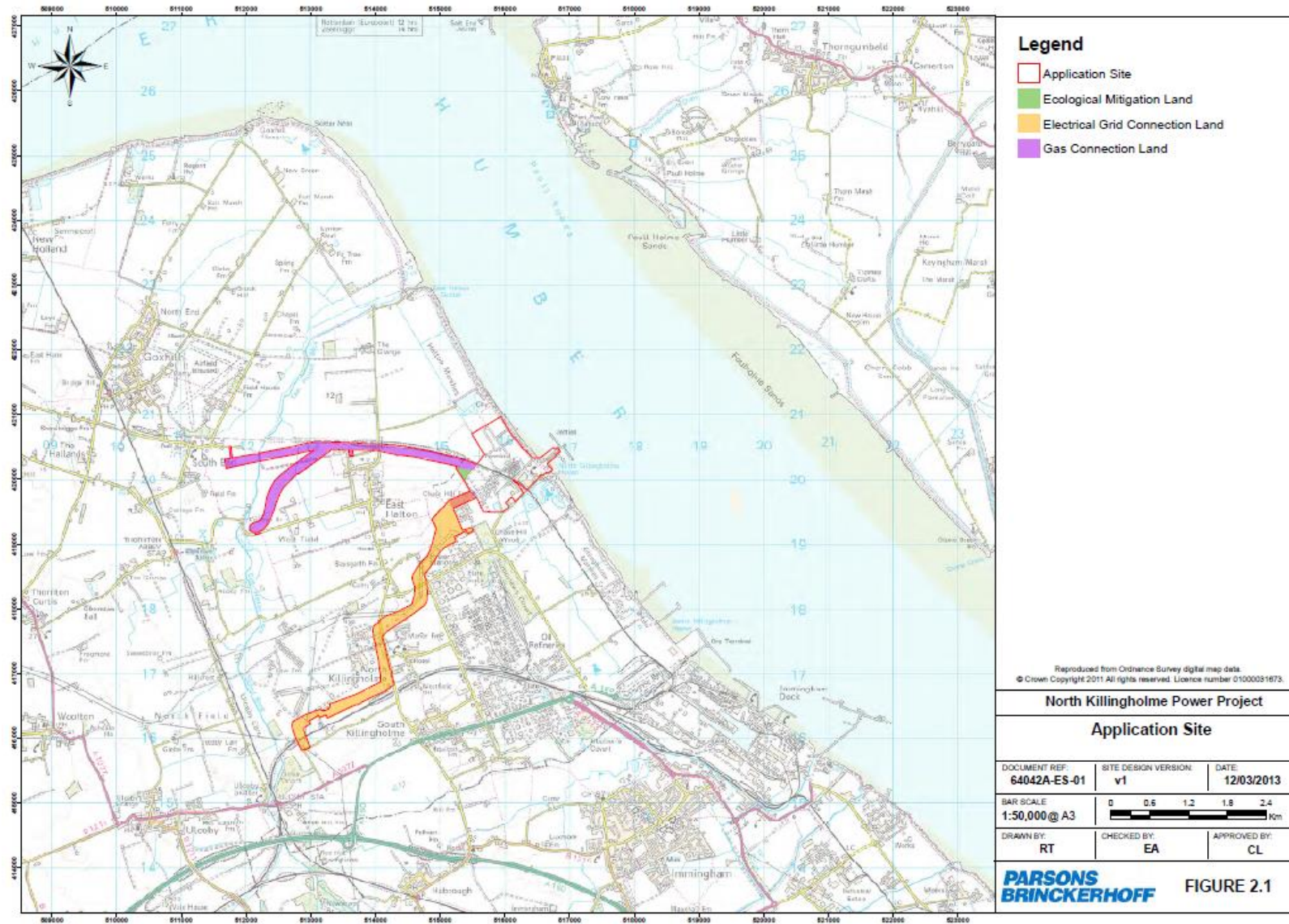
- 3.1 The project as proposed by the Applicant comprises of three main elements: the Principal Project Area; the Electrical Grid Connection Land; and the Gas Connection Land. The Principal Project Area lies approximately 5 km north west of Immingham Docks. This is in the Yorkshire and the Humber region of England. These main elements comprise approximately 286 ha:

- Principal Project Area - 108.2 ha
- Electrical Grid Connection Land - 92.9 ha
- Gas Connection Land - 84.8 ha

These are shown on Figure 1.

- 3.2 The **Principal Project Area** includes the operations area including the land proposed for the generating station, fuel handling areas (to supply and store fuel for the Generating Station via rail or sea and conveyors), cooling water connection (intake and outfall from the River Humber) and construction laydown areas.
- 3.3 **Electrical Grid Connection Land** comprises a corridor of land sufficient for a new connection to the National Electricity Transmission System.
- 3.4 **The Gas Connection Land** comprises two options for the route corridors for a new connection to a high pressure gas network (Gas Connection) in order to supply the Generating Station with natural gas as fuel.

Figure 1 Map of Project location from the applicant's Environment Statement volume 3 - figures

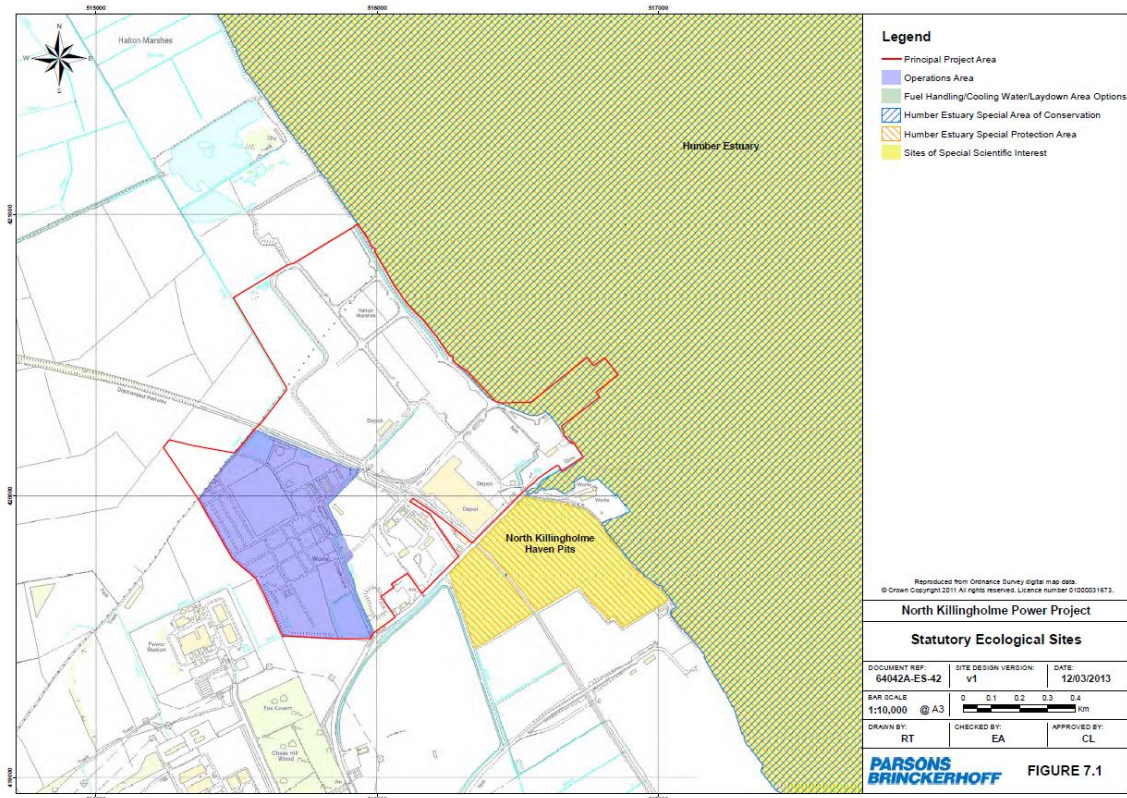


European and International Sites

- 3.5 The Humber Estuary is the largest macro-tidal estuary on the British North Sea coast. It drains a catchment of some 24,240 square kilometres and is the site of the largest single input of freshwater from Britain into the North Sea. It has the second-highest tidal range in Britain (max 7.4 m) and approximately one-third of the Estuary is exposed as mud or sand flats at low tide. The inner Estuary supports extensive areas of reedbed with areas of mature and developing saltmarsh backed in places by limited areas of grazing marsh in the middle and outer Estuary. On the north Lincolnshire coast the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. The Estuary regularly supports internationally important numbers of waterfowl in winter and nationally important breeding populations in summer (JNCC Information Sheet on Ramsar Wetlands¹).
- 3.6 The Humber Estuary is designated as a Special Area of Conservation (SAC) and a Special Protection Area (SPA) under the Habitats Regulations. The Humber Estuary is also a Ramsar site, afforded protection under the Convention on Wetlands of International Importance 1971. It is a matter of UK Government policy to afford Ramsar sites the same protection as Natura 2000 sites. These three designated sites combined make up the Humber Estuary European Marine Site (EMS). The terrestrial site of the proposed project lies on the south bank of the Humber Estuary adjacent to the Humber Estuary EMS with its cooling water intake and discharge structures located within the Estuary and SAC/ SPA/ Ramsar site boundaries.

¹ JNCC **Natura 2000 standard data form** for Special Protection Areas (SPA) for sites eligible for identification as Sites of Community Importance (SCI) and for Special Areas of Conservation (SAC) 23rd August 2007.

Figure 2 Map of Statutory Ecological Sites and Project area from the applicant's Environment Statement.



3.7 The boundary of the Humber Estuary SPA and Ramsar sites are broadly the same encompassing an area of approximately 37,600 hectares (SPA) - 37,988 hectares (Ramsar) of the Humber Estuary. The project is located 58km downstream of the upper limits and the boundary extends downstream to the North Sea

National Sites

3.8 **North Killingholme Haven Pits Site of Special Scientific Interest** is located approximately 3 km east of the Operations area. No part of the proposed Principal Project Area will be within the North Killingholme Haven Pits SSSI. However, delivery of fuel to the Project by rail has the potential to impact upon this SSSI as the railway line passes adjacent to it (ES, 2.5). The site has three pits supports saline coastal lagoon habitats. These support specialist lagoonal species including a population of tentacled Lagoon-worm *Alkmaria romijni* protected under Schedule 5 of the Wildlife and Countryside Act 1981. In relation to this application the lagoons support nationally important numbers of black-tailed godwit. The site is fringed in places with thick hawthorn scrub which provides important bird habitat. The common reed around the lagoons provides valuable feeding and breeding grounds for a range of summer migrants such as reed and sedge warblers.

3.9 The Humber Estuary SAC / SPA described above are also a SSSI. The Estuary naturally supports high suspended sediment loads. The sediment feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and

reedbeds. Also included within the SSSI are saline lagoons, sand dunes, standing waters habitats; wintering and passage waterfowl species; breeding bird assemblage of lowland open waters and their margins; vascular plant assemblages; invertebrate assemblage and grey seal, river and sea lamprey species. The envisaged impacts from the project to the features of special interest for this site are very similar to the Humber SPA and SAC.

4 Likely significant effects (LSE) test

- 4.1 An Appropriate Assessment (AA) is required if a plan or project is likely to have a significant effect on a European site, either alone or in combination with other plans or projects. A likely significant effect (LSE) is, in this context, any effect that may be reasonably predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated, but excluding trivial or inconsequential effects.
- 4.2 The purpose of this test is to identify LSEs on European sites that may result from the Project and to record the SoS conclusions on the need for an AA and his reasons for screening activities, sites or in combination plans and projects in or out of further consideration in the AA. For those features where an LSE is identified, these must be subject to an AA. This review of potential implications can be described as a ‘two-tier process’ with the LSE test as the first tier and the review of effects on integrity (AA) as the second tier.
- 4.3 This section addressed this first tier of the HRA, for which the SoS has considered the potential impacts of the Project both alone and in combination with other plans and projects on each of the interest features of the European sites identified in the RIES (and listed in Annex A) to determine whether or not there will be an LSE. Where there are predicted LSEs, these are described briefly in Table 1. Further detail is set out in the RIES Matrices.

Sites screened in/out

- 4.4 The following sites were included in the RIES LSE screening matrices. Natural England states in their Statement of Common Ground that they are satisfied that the relevant sites, listed below, for assessment have been identified:
- Humber Estuary Special Area of Conservation (SAC);
 - Humber Estuary Special Protection Area (SPA); and
 - Humber Estuary Ramsar site.

Treatment of decommissioning impacts

- 4.5 As outlined in 2.11 and 2.13 above, the anticipated operational lifetime of the project is 30 years. At the end of its lifetime, decommissioning must take place and at that point a separate authorisation will be needed. This would require new environmental assessment including the preparation of an EIA and HRA (including appropriate consultation with the relevant statutory

nature conservation bodies). A full environmental departure audit will be carried out to examine and recommend remedial actions for all potential environmental risks (ES, 3.10.9).

- 4.6 A site closure plan is needed as part of requirement 43 of the DCO. This plan will form part of the information needed for the sites Environmental Permit from the EA. Decommissioning will be undertaken in accordance with the Environmental Permit for the Project under the Environmental Permitting Regulations 2010.
- 4.7 It is not possible at this stage to predict with any certainty what the European and Ramsar site context of the Project will be in the future: sites may increase or decrease in importance over that time.
- 4.8 However, if the environmental baseline were to be similar to the current situation, then the impacts of decommissioning of the project could be expected to be similar to the anticipated impacts of construction. There is no reason to suppose that the impacts of decommissioning would cause an adverse effect on the Humber Estuary EMS site integrity and on this basis, the SoS considers that it is reasonable not to include a detailed discussion on decommissioning impacts in this report. He is satisfied that decommissioning effects will be addressed fully by the relevant authorities, prior to decommissioning and in light of more detailed information on decommissioning processes and environmental conditions at that time.

Potential impacts

- 4.9 The potential impacts used within the likely significant effects test were considered within the Applicant's HRA report and the RIES. These include habitat loss; fragmentation (e.g. a restriction of movement through or across the Estuary); air quality change (e.g. increased concentrations of NO_x and/ or increased nutrient/ acid deposition); hydrological change (e.g. discharge of cooling water/ process effluent and/or thermal plume and/or changes to hydromorphology); disturbance (e.g. noise or light or movement); mortality (e.g. resulting from fish mortality from cooling water extraction) and in combination effects.
- 4.10 The furthest reaching potential impact resulting from the proposed development is considered to relate to air quality deposition effects, with a 10 km radius applied in accordance with EA guidelines². This guidance confirms that no likely significant effects are anticipated beyond a 10 km radius from an installation. For a coal or oil-fired power station the limit is greater with a 15km radius.

Likely significant effects (LSE)

- 4.11 The Secretary of State (SoS) has considered the Project's potential construction, operational and decommissioning impacts on the interest features of the European sites (listed in Table 8 in

² Environment Agency (2011) *Environmental risk assessment for permits: overview. Annex F Air Emissions.*

Annex A) to determine whether there will be LSE in the context of the Habitats Regulations. LSEs as a result of the project are summarised below, with more detail included in the screening matrices in the RIES.

4.12 There is significant overlap between SAC/ SPA and Ramsar designations so for the purposes of this assessment, consideration of the Ramsar designations will be done in parallel with the Humber Estuary SPA and SAC designations. The SPA, SAC and Ramsar designation boundaries broadly overlap all covering the Humber estuary. Both the SPA and Ramsar designations also include North Killingholme Haven Pits. The Ramsar designating features also overlap with the SPA and SAC, including the estuarine habitats, fish, seals, the internationally important assemblage of non-breeding birds, as well as the internationally important populations of SPA bird species. NE's written representation REP-019-022 states that the qualifying features of the SAC and SPA will ensure that the interest features of the Ramsar are taken into account. The exception to this would be the natterjack toad, however, these will not be affected by proposals as the population is found at Saltfleetby to Theddlethorpe Dunes SSSI approximately 30km to the south of the project.

Table 1 Humber Estuary European Marine Site SAC, SPA and Ramsar features where LSE could not be excluded in the RIES

Designated Site	Feature where LSE could not be excluded
Humber Estuary Special Area of Conservation / Ramsar	<ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks • Estuaries • Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats • <i>Salicornia</i> and other annuals colonising mud and sand • Glasswort and other annuals colonising mud and sand • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) • <i>Petromyzon marinus</i>; Sea lamprey • <i>Lampetra fluviatilis</i>; River lamprey
Humber Estuary Special Protection Area / Ramsar	<ul style="list-style-type: none"> • <i>Botaurus stellaris</i>; Great bittern (Non-breeding) & (Breeding) • <i>Tadorna tadorna</i>; Common shelduck (Non-breeding) • <i>Recurvirostra avosetta</i>; Pied avocet (Non-breeding) & (Breeding) • <i>Pluvialis apricaria</i>; European golden plover (Non-breeding) • <i>Calidris canutus</i>; Red knot (Non-breeding) • <i>Calidris alpina alpina</i>; Dunlin (Non-breeding) • <i>Philomachus pugnax</i>; Ruff (Non-breeding) • <i>Limosa limosa islandica</i>; Black-tailed godwit (Non-breeding) • <i>Limosa lapponica</i>; Bar-tailed godwit (Non-breeding) • <i>Tringa totanus</i>; Common redshank (Non-breeding) • Waterbird assemblage of international importance

Humber Estuary SAC/ Ramsar (see RIES matrix A & C)

- 4.13 The RIES identifies LSE on the Estuary features and other habitats and species; mudflats and sand flats not covered by sea water at low tide; *Salicornia* and other annuals colonising mud and sand; Atlantic salt meadows; sea lamprey *Petromyzon marinus*; river lamprey *Lamporeta fluviatilis*.
- 4.14 The construction of the cooling water infrastructure within the Estuary has the potential to affect the features of the SAC through habitat loss and by fragmenting the features. There will be a small scale construction for the cooling water intake outside the inter-tidal habitat. The foundations of the intake will include vibration piling; this could impact on the habitats in direct contact, as well as river and sea lamprey and grey seals.
- 4.15 Given the limited nature of the piling and habitat loss, the Secretary of State agrees with NE (Statement of Common Ground), the RIES and the Applicant within their revised screening matrix and determined that this project does not have a likely significant effect on *Halichoerus grypus* grey seals. The Applicant screens this feature out on the basis that it is outside the project's zone of influence. NE's written representation from the 14th October 2013, states that the colony of breeding seals can be found at Donna Nook at the mouth of the Estuary outside the project zone of impact. Condition 20 of the Deemed Marine Licence within the DCO requires that piling will be undertaken in accordance with a piling method statement, that includes soft start procedures and pile pads/ shrouds suggested by NE to ensure that there are no effects on seals or lamprey from piling.
- 4.16 The cooling water intake structures will require up to 4 piles within the Estuary. The small construction footprint is approximately 3.2m², however it will be located next to the existing jetty in the main 'channel' below the tidal range of the Estuary. The Humber Estuary designated site has an intertidal area of approximately 9,382ha and a sub-tidal area of 16,800ha. The construction footprint is therefore approximately 0.0000019% of the total sub-tidal habitat within the Estuary or approximately 0.0000012% of the total estuarine habitat. The Project does not involve construction within the Estuary SAC intertidal habitat. NE within their statement of common ground does not find this significant due to the sub-tidal location, small area affected and pre-existing dredging activities. The jetty that will be used by the Applicant for the cooling water intake and outfall is already subject to regular disturbance from ship movements, ballasting operations and at least monthly dredging. NE have considered studies carried out by the Centre for Marine and Coastal Studies (CMACS) and found no impacts on inter-tidal or sub-tidal habitats from these activities. High levels of sedimentation in the Estuary means frequent dredging is needed to keep safe navigation of vessels.
- 4.17 The Secretary of State considers that the LSE on the Humber Estuary SAC and Ramsar habitat features at this location next to an existing working jetty is negligible, due to the very small size of the habitat loss (0.0000019% of the total sub-tidal habitat), its location within the sub-tidal part of the Estuary, and the fact that Condition 20 of the Deemed Marine Licence within the

DCO limits the maximum pile diameter, thus ensuring the limited size of the piles. The RIES was not able to exclude this habitat loss as having a fragmentation LSE on the Humber Estuary SAC features and the Applicant's integrity matrix was not able to exclude a habitat loss LSE on the Humber Estuary SAC features. For these reasons these LSEs are assessed in the next stage.

- 4.18 During operations the abstraction of water has the potential for direct mortality of fish including sea and river lamprey through impingement on the screens proposed for the cooling water intake. During operations the thermal and chemical properties of the cooling water discharge could also result in a thermal 'plume', discharge of dissolved solids including biocides (e.g. chloride) and scour from the discharge itself. The discharged water would be of a higher temperature than that within the Estuary. Migratory species such as sea and river lamprey are sensitive to changes in temperature. Where there are large differences in temperature within an Estuary this can create a barrier to migration, impacting on spawning and recruitment of the species. Depending on the volume of water the intake and outflow for the cooling water infrastructure has the potential to scour the bed of the Estuary.
- 4.19 The Applicant identified air quality changes during construction, operation and decommissioning of the project as a potential source of LSE on the SAC. Construction of the project without mitigation could impact on the SAC/ Ramsar through dust deposition. Operation of the project will also release pollutants including nitrogen oxides, carbon monoxide, sulphur dioxide and particulate matter (ES table 7.1). The EA's guidance³ states that conservation sites need to be considered where they fall within 10 km of a SPA, SAC or Ramsar site. Some larger emissions are required to screen to 15km. The EA identify that these emissions to air could impact on ecologically sensitive sites via an increase in the ground level concentrations of certain pollutants and the associated nutrient and acid deposition. The Applicant identifies two SAC features that would be sensitive to this pollution namely reedbeds and mudflats. Other features that are sensitive to air quality such as coastal dunes are beyond the 15km screening limit.
- 4.20 Reedbeds are impacted through eutrophication of the water supply which can affect the structural, photosynthetic and/or aeration tissues of the plant, which can result in weakened stems and regression of the reedbed (Environment Agency, 2004⁴). As identified in the Applicant's ES mudflats can also be affected by eutrophication.
- 4.21 The Humber Estuary forms a transition zone between a fresh water river habitat and marine habitats. Within the SAC some habitats are formed mainly due to the marine influences, such as tides, waves, and the influx of saline water; others are created by riverine influences, such as flows of fresh water and sediment. The project is located far enough away from some of the more marine habitats and NE's advice, as set out in their statement of common ground, is that

³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/298239/geho0410bsil-e-e.pdf

⁴ Wheeler, B.D. Gowing, D.J.G. Shaw, S.C. Mountford J.O., and Money R.P., 2004. *Ecohydrological Guidelines for Lowland Wetland Plant Communities* (Eds. A.W. Brooks, P.V. Jose and M.I. Whiteman). Environment Agency.

the project is not likely to have a significant effect on these SAC and Ramsar features due to distance:

- Coastal lagoons;
- Embryonic shifting dunes;
- Shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”),
- Shifting dunes with marram;
- Fixed dunes with herbaceous vegetation (“grey dunes”), Dune grassland; and
- Dunes with *Hippophae rhamnoides*, Dunes with sea buckthorn.
- the natterjack toad

Humber Estuary SPA/ Ramsar (see RIES matrix B & C)

4.22 The Estuary supports large assemblages of waterbirds. This species assemblage comprises many different species including many non-waterfowl species. In addition to the overall population, the site supports a variety of key qualifying species; those which are present in nationally or internationally important numbers (a minimum of 1% of the respective population).

4.23 NE guidance states that bird communities are highly mobile and exhibit patterns of activity related to tidal water movements and many other factors. Different bird species exploit different parts of a marine area and different prey species. Changes in the habitat may therefore affect their food distribution and availability differently. The bird populations at this site require habitats that are capable of supporting their feeding, roosting and nesting requirements. The most important factors related to this include:

- current extent and distribution of suitable feeding and roosting habitat;
- sufficient food availability;
- minimal levels of disturbance consistent with maintaining conditions for birds feeding and roosting and;
- water quality, quantity and salinity necessary to maintain plant and animal communities.

4.24 The direct impacts on the SPA will mirror those presented above for the SAC. The list of qualifying features where a LSE could not be screened out was agreed between the Applicant and NE and is listed in Table 1.

4.25 The LSE have been identified as disturbance, habitat loss and in-combination effects in the RIES.

4.26 Construction of the project will cause increased disturbance from noise, light, vehicular (including train) movement and human activity. Dust deposition and pollution from construction could cause contamination to the SPA. Construction traffic will pass a few hundred metres from the North Killingholme Haven Pits section of the SPA. The construction of the pipeline for the

cool water connection within an existing area of disturbance is unlikely to cause additional disturbance impacts (Environmental Statement 7.5.22).

- 4.27 The impact on populations of SPA waterbirds outside the SPA/ Ramsar site is also raised by NE. In particular the fields adjacent and to the northwest of the Project provide suitable foraging and roosting for a number of bird species. These fields are also to be enhanced to provide optimal wet grassland habitat for these birds as part of the Able Logistic Park development. The Applicant has suggested measures to address the disturbance impacts resulting from the Project's construction works which include physical barriers or hoardings to be fitted around the Principal Project Area and associated Construction Laydown Area on its northern, eastern and north-western boundaries.
- 4.28 The shadow HRA produced by the Applicant considers habitat loss as a result of the Project and specifically the operations area. Their desk study found a very low number of birds during previous surveys. A 2010 wintering bird survey found one roosting lapwing and three mallard within the Operations Area. Only Individual or small numbers of curlew and black-tailed godwit have been recorded flying over the site. The report agrees with the findings of the Applicant and does not consider this habitat loss to be an LSE on the integrity of the SPA/ Ramsar.
- 4.29 The cooling water intake structures will result in the loss of 3.2m² of estuarine habitat, through four piles needed to support the pumping systems for the cooling water connection. The Applicant identifies that habitat loss could affect species which are using the estuary for wintering/ staging/ passage. The vibration piling without mitigation as part of construction could disturb wintering or breeding birds.
- 4.30 During operations the RIES screens out an LSE from the direct hydrological changes from the cooling water infrastructure on the SPA features. In particular this is in terms of thermal and water quality impacts from the cooling water discharge. There is no evidence that these changes could impact on the SPA. The SoS therefore considers that there is no LSE from discharges of cooling water, the thermal plume or small changes to hydromorphology in the Humber Estuary.
- 4.31 The unmitigated air quality changes during construction, operation and decommissioning of the project are a LSE on SAC/ Ramsar habitats. The environmental statement does identify potential small dust impacts to the SPA during construction of the conveyor. This however will be fully mitigated through requirements 15 & 26 in the DCO. These requirements will ensure that dust emissions are controlled during construction of the Project. There are not direct impacts on the SPA features identified, therefore in line with the RIES and NE advice these are not considered further.
- 4.32 The Applicant identified fragmentation within their screening matrices however the SoS gives weight to the Panel's recommendation and is in agreement to screen out a LSE. The evidence within the Applicant's report to inform the Habitats Regulations Assessment and Environmental Statement does not identify any fragmentation impacts. The operational area was not found to

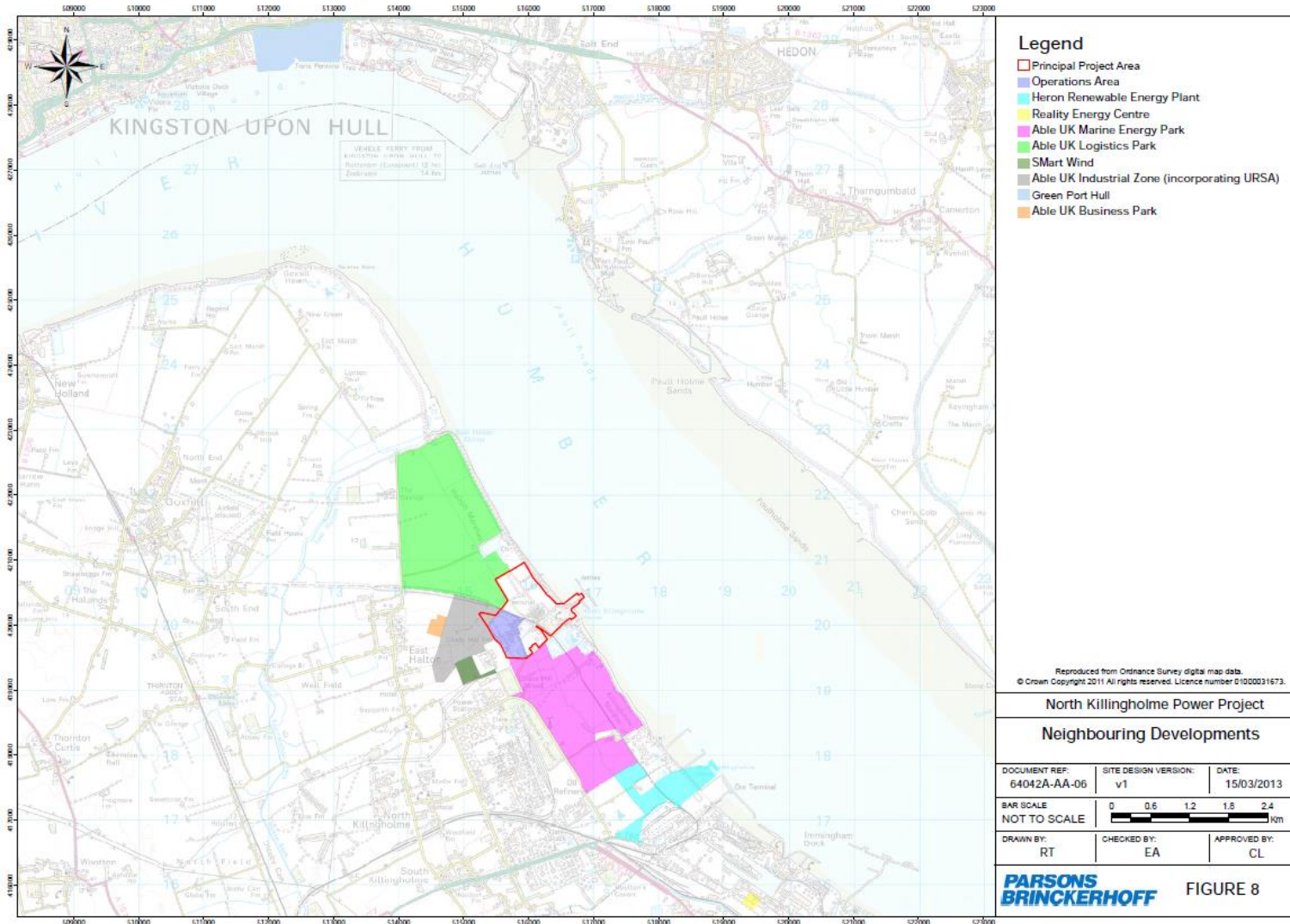
be in the flight line or of roosting/ foraging importance for any of the SPA or Ramsar criteria. NE has not raised fragmentation as a likely significant effect to be addressed. The examining authority has therefore not identified a LSE within their RIES matrices.

Likely Significant Effects: In-Combination

- 4.33 Under the Habitats Regulations, the SoS is obliged to consider whether other plans or projects might affect some of the same European sites as the Project. The Applicant has addressed potential in-combination impacts within their shadow HRA Report. NE did not agree with the methodology of the Applicant's in-combination assessment. However, they did agree with the subsequent analysis and proposed mitigation to resolve any in-combination issues.
- 4.34 There was a dissenting view from Able UK who are an interested party. One of the concerns was that the project's generator station in-combination with Able Marine Energy Park (AMEP) could lead to a far greater significant effect on the Humber Estuary EMS. They were also concerned about the lack of consideration and/or assessment of the impact of the project's generator station on the AMEP proposed compensation and mitigation habitat and on train movements' impact on NKHP SSSI. As part of the AMEP development compensatory and mitigation measures are proposed. The panel's report notes that the project's operations area is about 4 km from the AMEP compensatory habitat and notes the lack of pathway of impact between the projects.
- 4.35 The AMEP development will have a potential impact on wetland bird species occurring in Killingholme Marshes foreshore, North Killingholme Haven Pits and Killingholme Fields. For each of these areas compensation habitat is proposed. Based on advice from NE the SoS will consider the potential disturbance to North Killingholme Haven Pits from the Project in combination with potential disturbance from AMEP.
- 4.36 In this case the three key developments all adjacent to the Project were considered by the Applicant for the purpose of in-combination assessment:
- Able Logistics Park (ALP), north of the Project, this has planning permission but has not been built;
 - URSA Glass-Wool Production facility, west of the Project; the full planning permission has run out and they applied for this to be extended on the 31st October 2011, but currently they have withdrawn this application;
 - Able Marine Energy Park (AMEP), south of the Project. Currently a Parliamentary Joint Committee is considering 2 petitions made against the Development Consent Order for this development.

This report limits the scope of the Secretary of State's in combination assessment solely to these projects. The panel report states that there was no disagreement over the scope of developments included. All other developments in-combination with the project were not considered to have LSE on the Humber Estuary EMS.

Figure 3 Developments in close proximity to the Project. Information extracted from the Applicant's Report to inform Habitats Regulations Assessment



- 4.37 Section 2.7 and 16.6 of the Applicant's Environmental Statements set out the reasons to include these three developments. The location of the development and identified potential in combination of impacts on the Humber Estuary EMS means they warrant further examination. The HRA of AMEP has predicted adverse effects and mitigation and compensation measures have been proposed. The ALP and the URSA Glass-Wool Production facility have the potential to alter the roosting patterns of the water bird interest.
- 4.38 The project will need gas and electricity connections as part of the whole development. These will be subject to separate applications. These works would be carried out on fields with significant populations of wintering birds (NE Statement of Common Ground). NE advises in their comments to the second round of questions that if works on the connections are restricted to July to August there will be no LSE on the Humber Estuary SPA/ Ramsar so no requirement to do an in-combination assessment. The timing of the works will allow the period that these birds are using the habitat to be avoided. The separate applications would also be subject to regulations on the Habitats Directive and this mitigation can be secured through appropriate conditions in the relevant planning consents for the connection projects. The SoS is therefore content that these works do not need to be considered within an in-combination assessment.
- 4.39 Paragraph 2.11 of NE's Statement of common ground states that it is not necessary to assess the following projects since they will not have ecological interactions with the Project as they are distant from it, or they are not of a nature likely to interact:
- Heron Renewable Energy Plant, Drax
 - Reality Energy Centre, Real Ventures
 - A160 Highways Improvements, Highways Agency
 - SMart Wind - Hornsea Offshore Wind Farm (Zone 4)
 - i. Project One and
 - ii. Project Two.
- 4.40 Air emissions and cooling water discharges will need assessment in-combination with discharges from other developments. The SoS notes that the EA consider that air quality emissions from the existing Centrica and E.ON Killingholme power stations and Total UK and Phillips 66 oil refineries require in-combination assessment with the Project as part of the Project's Environmental Permit. The UK operates a multi-stage consenting process with the requirements of the Habitats Directive applied at each stage. Although the DCO covers the construction and operation of the project, it would be a criminal offence to operate the project without the required permits and licences in place. The SoS relies on the expertise of the EA as an independent regulator to assess the in-combination effects of air emissions and water discharges and to properly discharge its duties as competent authority under the Habitats Directive for the environmental permits. He is mindful of the provisions in the Overarching

National Policy Statement for Energy⁵ which sets out the assumption that pollution control regimes will be properly enforced and applied.

4.41 The SoS therefore relies on the expertise of the EA and the robustness of the environmental permitting regime to ensure that the Project will not have significant effects on the Humber Estuary SPA/Ramsar due to in-combination effects of air emissions and water discharges. No future developments are considered to represent additional point sources of airborne pollutants.

Conclusions on Likely Significant Effects

4.42 The SoS agrees with the panel that an AA is required and that this should concentrate on the following in considering the impact of the project alone on the integrity of the Humber Estuary EMS:

- Habitat loss
- Fragmentation
- Air quality
- Hydrological changes
- Mortality
- Disturbance

The following will be considered in combination with other plans and projects:

- Hydrological change
- Air quality
- Disturbance

4.43 The SoS considers that sufficient information has been provided in particular by the Applicant, NE and the EA to inform a robust assessment in line with his requirements under the Habitats Regulations.

⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/37046/1938-overarching-nps-for-energy-en1.pdf

5 Appropriate assessment

Test for Adverse Effect on Site Integrity

- 5.1 The requirement to undertake an Appropriate Assessment (AA) is triggered when a competent authority, in this case the SoS, determines that a plan or project is likely to have a significant effect on a European site either alone or in combination with other plans or projects. Guidance issued by the European Commission states that the purpose of an AA is to determine whether adverse effects on the integrity of the site can be ruled out as a result of the plan or project, either alone or in combination with other plans and projects, in view of the site's conservation objectives (European Commission, 2001⁶).
- 5.2 The purpose of this AA is to determine whether or not adverse effects on the integrity of those sites and features during the LSE test can be ruled out as a result of the Project alone or in combination with other plans and projects in view of the sites conservation objectives and using the best scientific evidence available.
- 5.3 If the competent authority cannot ascertain the absence of an adverse effect on site integrity within reasonable scientific doubt, then under the Habitats Regulations, alternative solutions should be sought. In the absence of an acceptable alternative, the project can proceed only if there are imperative reasons of overriding public interest (IROPI) and suitable Compensation measures identified. Considerations of IROPI and Compensation are beyond the scope of this AA.

Conservation Objectives

- 5.4 European Commission guidance indicates that disturbance to a species or deterioration of a European site must be considered in relation to the integrity of that site and its conservation objectives (European Commission, 2000). Section 4.6.3 defines site integrity as:
- “...the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified.”*
- 5.5 Conservation objectives outline the desired state for a European site, in terms of the interest features for which it has been designated. If these interest features are being managed in a way which maintains their nature conservation value, they are assessed as being in a 'favourable condition'. An adverse effect on integrity is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of its designation (English Nature, 1997⁷).

⁶ European Commission Assessment of plans and projects significantly affecting Natura 2000 sites. November 2001 - http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf

⁷ English Nature,(1997). *Habitats Regulations Guidance Note*, HRGN 1.

5.6 There are no set thresholds at which impacts on site integrity are considered to be adverse. This is a matter for interpretation on a site-by-site basis, depending on the designated feature and nature, scale and significance of the impact. The conservation objectives for the interest features for which LSE were identified are listed in Table 1. These have been used by the SoS to consider the potential for adverse impacts on integrity of the Humber Estuary EMS, as a result of the project in combination with other plans or projects.

6 The Humber Estuary EMS Conservation Objectives

Humber Estuary SAC and Ramsar

6.1 The Humber Estuary SAC and Ramsar have been designed on the basis of the important features listed in Annex A. All of the qualifying features which could be affected by the project are considered in this section:

- Estuaries;
- Sandbanks which are slightly covered by sea water all the time;
- Mudflats and sandflats not covered by seawater at low tide;
- *Salicornia* and other annuals colonising mud and sand;
- *Glasswort* and other annuals colonising mud and sand;
- Atlantic salt meadows (*Glauco-Puccinellietalia maritima*);
- *Petromyzon marinus*; Sea lamprey and;
- *Lampetra fluviatilis*; River lamprey.

6.2 The conservation objectives of the **Humber Estuary SAC** are set out below in Table 2. The full list of qualifying features for this site is listed in Annex A.

Table 2: Conservation objectives for Humber Estuary SAC from the RIES.

Conservation Objectives	<p>Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features.</p> <p>Subject to natural change, to maintain or restore:</p> <ul style="list-style-type: none"> • The extent and distribution of qualifying natural habitats and habitats of qualifying species; • The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species; • The supporting processes on which qualifying natural habitats and habitats of qualifying species rely; • The populations of qualifying species; and, • The distribution of qualifying species within the site.
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Humber Estuary SPA and Ramsar

- 6.3 The Applicant's Environmental statement (7.4.7 – 7.4.8) identifies birds of importance to designate the SPA. During the **breeding season** the SPA supports at least 10.5% of the GB bittern (*Botaurus stellaris*) population, 2.1% of the GB little tern (*Sterna albifrons*) population and 6.3% of the GB marsh harrier (*Circus aeruginosus*) population. During the **winter** the SPA supports over 187,000 individual birds, comprising over 40 species. Of note the SPA supports at least 3% of the British bar-tailed godwit (*Limosa lapponica*) population; at least 2% of the British bittern (*Botaurus stellaris*) population; at least 11.7% of the British golden plover (*Pluvialis apricaria*) population and at least 2.7% of the British hen harrier (*Circus cyaneus*) population. It also supports at least 1.7% of the Northern Siberia / Europe / Western Africa population of dunlin (*Calidris alpina*); at least 9.7% of the population of knot (*Calidris canutus*) for the same geographical area; at least 3% of the redshank (*Tringa tetanus*) population of the same area and at least 1.4% of the shelduck (*Tadorna tadorna*) population for the same area. The SPA also supports important numbers of at least ten bird species while **on passage** through the estuary. The key populations include at least 2.9% of the eastern Atlantic population of redshank and at least 1.8% of the Atlantic / Western and Southern Africa population of sanderling (*Calidris alba*).
- 6.4 The Environmental Statement has used a number of different data sources to inform the likely impacts on birds from the project. The surveys cover all the project area and NE in their statement of common ground agreed that they provide a robust picture of the surrounding area. The Applicant did not find any bird recording of breeding birds within the project's operations area. Dunlin and black-tailed godwit were found to be by far the most abundant species on the estuary in the autumn (ES 7.4.50). The Institute of Estuaries and Coastal Studies has shown the importance of the intertidal zone for wader bird species using the Estuary. This habitat in the vicinity of the project is considered by NE to be particularly important to black-tailed godwit, probably due to the proximity of the inter-tidal zone to the high tide roost at NKHP (ES 7.4.59).
- 6.5 The NKHP supports populations of a number of important breeding SPA species including marsh harrier and avocet (ES 7.5.60).

Table 3 Humber Estuary SPA Conservation Objectives from the RIES.

<p>Humber Estuary SPA Conservation Objectives</p>	<p>Avoid the deterioration of the habitats of the qualifying features, and the significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive.</p> <p>Subject to natural change, to maintain or restore:</p> <ul style="list-style-type: none"> • The extent and distribution of the habitats of the qualifying features; • The structure and function of the habitats of the qualifying features; • The supporting processes on which the habitats of the qualifying features rely; • The populations of the qualifying features; and, • The distribution of the qualifying features within the site.
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7 Assessment of effects on the Humber Estuary EMS from the project alone

- 7.1 Estuaries are complex and highly productive ecosystems, supporting a wide range of habitats and species, which are closely associated with surrounding terrestrial habitats. The Humber Estuary has been selected as entire unit, to include all habitats that are important to the integrity of the site. In particular, the entire water column has been included due to its importance not only in the biological functioning of the system, but also as the means by which sediment is mobilised and transported. The Humber Estuary is extremely turbid and sediment transport is particularly important within the Estuary.
- 7.2 Estuaries form the interface between freshwater and marine environments and extend from the upper limit of tidal influence to the open sea. Where freshwater and seawater meet, and where current flows are reduced in the shelter of estuaries, fine sediments are deposited, often forming extensive intertidal mudflats and sandflats. These habitats are typically inhabited by a variety of invertebrates, many of which provide important sources of food for fish, waterbirds and seabirds. At higher elevations within the tidal range, the mudflats and sandflats are exposed for sufficient periods to become vegetated with salt-tolerant plants forming saltmarshes, which play an important role in the nutrient and sediment cycling processes within the estuarine ecosystem. Saltmarshes also provide essential feeding and roosting areas for waterbirds. The intertidal and subtidal sediments of estuaries support biological communities that vary depending on their geographic location, sediment type, salinity gradients and the tidal currents within the Estuary.

Habitat loss and fragmentation within the Humber Estuary SPA/ SAC

- 7.3 The cooling water intake structures will require up to 4 piles within the estuary. The small construction footprint is approximately 3.2m², however it will be located in the main 'channel' below the tidal range of the estuary. The Humber Estuary designated site has an intertidal area of approximately 9,382ha and a sub-tidal area of 16,800ha. The Applicant's proposal does not involve construction within the intertidal habitat of the Estuary. NE within their statement of common ground does not find this significant due to the small area affected and pre-existing dredging activities. The jetty that will be used by the Applicant for the cooling water intake and outfall is already subject to regular disturbance from ship movements, ballasting operations and at least monthly dredging. NE refers to studies carried out by the Centre for Marine and Coastal Studies (CMACS) which have not shown impacts from these activities. High levels of sedimentation in the Estuary means frequent dredging is needed to keep safe navigation of vessels.
- 7.4 The RIES excludes an adverse effect on integrity of the Humber Estuary SPA, due to the small size and its location within a pre-existing disturbed area. The RIES also does not find a likely significant effect on the Humber Estuary SAC from habitat loss. The Applicant, within their revised

integrity matrices and shadow HRA, does find a likely significant effect from habitat loss on the estuaries features of the Humber Estuary SAC. However, NE's statement of common ground, for the same reasons as those for the Humber Estuary SPA, excludes an adverse effect on integrity of the site. The SoS considers impact on the Humber Estuary SAC, SPA and Ramsar habitat features at this location next to an existing working jetty is negligible, due to the very small size of the habitat loss, its location within the sub-tidal part of the estuary.

- 7.5 The RIES identifies that the construction of the cooling water intake could have a fragmentation effect on the estuaries, sea lamprey and river lamprey features. The SoS agrees with the Applicant and the RIES that this will not have an adverse effect on integrity, as for habitat loss, - because the area to be developed for the cooling water intake structures will be small, in a sub-tidal location and will not form a barrier to migrating lamprey within the estuary.
- 7.6 **Condition 20 of the DML limits the maximum pile diameter without further agreement, thus ensuring the limited size of the piles. Consequently the SoS has determined that this habitat loss will not have an adverse impact on site integrity.**

Fish Mortality

- 7.7 The project will abstract water for cooling purposes. The Applicant states that the total abstraction requirements for the Project would be up to 43 200 m³/day at velocities of less than 1 m³/s. The Humber Estuary is the largest macro-tidal estuary on the British North Sea coast. It drains a catchment of some 24,240 square kilometres and the freshwater flow into the Humber estuary from the rivers averages at about 246 m³/s, ranging from 60 m³/s in drier periods to 450 m³/s in wet periods⁸. Peak flows of up to 1500 m³/s have been recorded during floods. The volume of water passing Spurn Head at the mouth of the Estuary during a spring tide is about 1.7 x 10⁹ m³ but only 60% of this during a neap tide. This is a relatively small abstraction of water will need to be screened to prevent trash, weed as well as fish and marine mammals entering the cooling water system. NE's statement of common ground discusses how the cooling water intake without mitigation could have a LSE through entrapment on fish. Larger animals such as fish can get trapped on water intake screens. Smaller animals suffer entrainment if they pass through the screens and pass through cooling water system. The intake screening needs to be designed to ensure that there is no residual mortality of SAC/ Ramsar fish species. The deemed Marine Licence for the Project will ensure suitable specifications of the intake screen. The screening specification will also be required prior to operations through the Environmental Permitting Regime. NE in their Statement of Common Ground consider that this is a relatively small abstraction of water and given the size and design of the intake systems and high volume and dilution factor within the Estuary it will have an insignificant impact.

⁸ JNCC (2007) Information Sheet on Ramsar Wetlands – Humber Estuary

7.8 In the ES the Applicant discusses lamprey swimming speeds in order to understand the risk of impingement or entrainment. Adult sea lamprey can swim in excess of 1.1 m/s (Maitland 2003⁹; Almieda, 2007¹⁰) and have burst swimming speeds in excess of 1.5 m/s, while newly matured adults can sustain speeds of 0.3 m/s (Beamish 1974¹¹). Adult river lampreys are smaller and about 30 cm in length. The fish are active swimmers and are capable of speeds of about 0.3m/s (Lucas et al 2007¹²), which is similar to newly matured sea lamprey. Juvenile river lampreys have a burst speed in excess of 0.2 m/s.

7.9 A number of passive and active methods for fish screening could be adopted by the Applicant. Active methods include methods such as an acoustic fish deterrent, however because lamprey are not good at hearing, passive methods are advised by the EA. Passive deflection focuses on the approach velocities around the intake. By keeping velocities low this prevents fish being drawn in; EA guidance (2005)¹³ advises that the intake design should lie parallel to the tidal flow meaning water is abstracted at right angles. In line with EA guidance small abstractions of a few m^3s^{-1} or less needed by CCGT power stations, Passive Wedge Wire Cylinder (PWWC) screens are regarded in Britain as the best available technology for juvenile and larval fish protection.

The applicant Passive Wedge Wire Cylinder screens have a number of features that make them suitable for prevention of fish entrainment. These include the low through-slot velocity, allowing fish to swim away, the relatively smooth external presentation of the screen, which reduces the risk of fish abrasion, and the narrow slot widths available, making it possible to prevent entrainment of fish even down to egg or larval sizes.

Environment Agency Guidance (2005)

7.10 NE in their written representation of the 14th October 2013 notes that the Applicant intends to install a PWWC screen over the cooling water intake to reduce impacts on SAC fish in line with Environmental Permitting Regulations requirements. The intake will be required to have a low velocity impact of no greater than 0.1 m/s. With an intake velocity of 0.1m/s, as discuss above the Applicant expects that the swimming speeds of sea and river lamprey will allow them to avoid impingement or entrainment on the filter screen from intake velocities.

7.11 NE in their statement of common ground and the Applicant within their revised integrity matrices identified that there will be times when the velocity of the river would be greater than 1.5m/s, which would be greater than the burst swimming speed of river lamprey mentioned above. This would mean that these velocities could, in theory, trap the lamprey against physical structures (which have no 'intake velocity') present in the River Humber. However, it is possible for lamprey to swim perpendicular to the direction of the tidal flow in order to avoid (i.e. swim around) such

⁹ Maitland. P. S. (2003) Ecology of the River, Brook and Sea Lamprey, Conserving Natura 2000.

¹⁰ Almeida. P., Póvoa. I., Quintella. B. R. (2007) Laboratory protocol to calibrate sea lamprey EMG signal output with swimming, *Hydrobiologia*, 582, 209-220.

¹¹ Beamish. F.W. (1974) Swimming performance of adult sea lamprey, *Petromyzon marinus*, in relation to weight and temperature, *Transactions of the American Fisheries Society*, 103, 355-358.

¹² Lucas. M.C., Greaves. R.K., Bubb. D.H., P. S. Kemp. (2007) Stanley Mills Lamprey Report, Scottish Natural Heritage Commissioned Report No. 256 (ROAME No. F04LH03).

¹³ A.W.H.Turnpenny & N. O'Keeffe (2005) Screening for Intake and Outfalls: A best practice guide. Environment Agency

structures as the flow velocity in this direction will be virtually zero. The smooth 'wedge' nature of the PWWC is design to help 'guide' fish around the cooling water intake. In addition, the inlets will be designed to abstract water perpendicular to the direction of the tidal flow and therefore there will be no additive effects between the velocity at the inlet and the velocity within the Humber Estuary. Where fish species are swimming past the inlets in this instance, the tidal flow velocity will be dominant over the 0.1m/s at the inlet such that the fish will be effectively pushed away from the inlet thus removing the potential for the impingement of fish species. NE's statement of common ground with the Applicant concludes that the Project is therefore not adding to any impingement effects on lamprey.

- 7.12 This fish screening requirement is set out in condition 19 of the deemed Marine Licence within the DCO. The EA within their written representation confirms that they would also ensure the correct screen specification is covered through the Environmental Permitting process. Additionally they highlight in their oral statements the need for correct screen specification for eels¹⁴ which they can do through the Environmental Permitting process. As described above both the velocity of water and screen size is important to ensure SAC lamprey and eels can escape from the cooling intake.
- 7.13 The RIES and NE consider that adverse effect on the integrity of the Humber Estuary SAC can be ruled out in light of the above. In agreement with the EA the deemed Marine Licence will ensure that suitable specifications of the intake screen will be required through the Environmental Permit. The Statement of Common Ground with the EA also confirms that the Applicant must put forward acceptable mitigation before the scheme can operate. This will be achieved through the Environmental Permitting Regime. **Condition 19 of the deemed Marine Licence ensures that no activities can commence prior to a scheme, to minimise the impact of the intake system on the Humber Estuary including a PWWC to minimise effects on fish screening requirements, is agreed with the MMO in consultation with the EA. The SoS therefore has confidence that there will be no adverse impacts on the Humber Estuary SAC as a result of fish mortality as a result of mitigation requirements in the DCO and the need for an Environmental Permit, prior to operation.**

Hydrological impacts and Fragmentation on the Humber Estuary SAC

- 7.14 The cooling system for the proposed plant will discharge heated water into the Humber Estuary EMS. Changes in physio-chemical parameters (such as water temperature) adversely affect water quality and the ability of the site to support the interest features for which it is designated. The Humber Estuary acts as an important migration route for both river lamprey and sea lamprey between coastal waters and their spawning areas. Migratory species such as sea lamprey and river lamprey can be sensitive to changes in temperature and, in extreme circumstances, large

¹⁴ Environment Agency's Eel Manual 'Screening at intakes and outfalls: measures to protect eel'.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297342/geho0411btqd-e-e.pdf

differences in temperature could act as a barrier and influence migratory behaviour. In turn, this could impact upon spawning and recruitment of these species.

- 7.15 The Applicant in their ES section 13.5.51- 13.5.58 predicts that the discharged cooling water will be approximately 10°C warmer than the ambient water temperature within the Estuary. The discharge volumes are however small (<1 m³ /s), meaning the plume is not predicted by the Applicant to extend beyond 100-200m from the discharge point. The plume is defined as water that is raised 1°C above background levels. The Applicant has stated that they used EA methodology to assess the plume and found the localised increases of water temperature are less than 0.2°C.
- 7.16 The RIES notes that the existing two outfalls of Centrica and E.ON power stations are equivalent to the Project's proposed discharge and can be used to assess the potential 'zone of influence'. The Applicant has used the Thermal Plume Assessment from the Able Marine Energy Park (AMEP) project; this found that at slack water for both high tide and low tide, the thermal plume from each of the existing outfalls extends to no more than between 100-200 m from the discharge point. The RIES concludes that a rise in water temperature has the potential to impact spawning and migratory species, but the area / extent of the thermal plume is very local and is unlikely to impact upon migratory species. They highlight that the area likely to be affected by the thermal plume is used as a migratory route and is not suitable for spawning. The area affected by the thermal plume is very localised and the Applicant's assumption is that migratory species will have the capacity (given the width of the estuary at this location) to migrate 'around' the plume.
- 7.17 The EA stated in reply to written questions that they are satisfied with the methodology deployed by Able UK to model the thermal plume interactions with the Centrica and EON outfalls into the Humber Estuary, and the potential impacts of the AMEP on these outfalls in terms of thermal changes. It would seem appropriate to use some of the results from the AMEP application as a proxy to infer the likely impact of the proposed North Killingholme outfall on temperature within the Humber Estuary, if the likely cooling water purge is going to discharge at 10°C above the wet bulb temperature of the Humber Estuary (paragraph 13.5.55). The EA question the assumption that the temperatures will be similar in the Project as the discharges assessed in the AMEP application; however this is the temperature that the Applicant is predicting in their ES. The discharge will also be regulated through the Environmental Permit regime and the EA can set temperature limits as part of the permit.
- 7.18 From the ES the Applicant has identified the next closest discharge point as Centrica power station which is more than 500 m south east of the jetties and therefore concludes no significant interaction is expected with the operation of the existing Power Stations.
- 7.19 NE's Statement of Common Ground finds that the potential impacts have been adequately addressed. The EA agrees that the discharge zone from the Project will not interact with the existing discharges as they are 500m away from each. The EA do highlight that at this stage they cannot determine whether thermal plume modelling will be sufficient without a detailed permit application. It would be for the Applicant to justify the method used based upon the impact and

assessment of the site of discharge. Further modelling may be required for the Environmental permit based on this assessment.

- 7.20 The Applicant states that some chemicals will be added to the conditioning of the cooling water, including biocides such as chlorine dioxide or sodium hypochlorite. This is to prevent bio-fouling within the cooling system. The impact of these chemicals was not found by the Applicant to change overall WFD status of the receiving water body in the Humber Estuary. All aqueous effluents generated through the Project will discharge into the Estuary following, where possible re-use and treatment. The main sources under scenario B (CCGT plant) are the heat recovery steam generator, and demineralisation plant.
- 7.21 Table 4 from the Applicant ES includes the combined discharge concentrations of each substance. The effluents from the HRSG and the demineralisation plant will be mixed with the cooling tower purge prior to being discharged into the Humber Estuary. This table shows all the process contributions are less than 4% of the relevant Environmental Quality Standard, putting them all within the thresholds set out in EA Environmental Permit guidance annex D¹⁵. The EA during the examination agreed that potential impacts from this discharge had been scoped out. The Environmental Permit needed for the discharge will set conditions to ensure the emissions and discharges are at a level that will not result in significant impact on the environment. The EA in their written representation also agreed that the project should not impact on the overall Water Framework Directive status for the Humber.

¹⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/298245/geho0810bsxl-e-e.pdf

Table 4 extract from the Applicant's ES showing the Process Contribution of EQS Substances ($\mu\text{g/l}$) in their discharge to the Humber Estuary.

Parameter	Discharge Concentration ($\mu\text{g/l}$) Table 13.8 of the ES	Process Contribution (Discharge concentration / dilution factor)	Long Term (Annual) Average EQS Table 13.2 of the ES	Percentage of EQS
Priority Substances				
Cadmium	0.15	0.003	0.2	1.4
Mercury	0.02	0.0003	0.05	0.6
Lead	0.16	0.003	7.2	0.04
Nickel	4.04	0.075	20	0.4
Specific Pollutants				
Cyanide, (as CN ⁻)	0.02	0.0004	1	0.04
Arsenic	4.01	0.074	25	0.3
Chromium	0.76	0.014	0.6	2.4
Copper	7.83	0.145	5	2.9
Zinc	13.25	0.245	40	0.6
Iron	148.47	2.749	1000	0.3
Physico-Chemical Standards				
Ammonia (as NH ₄ ⁻)	68.17	11.36	300*	3.8
N-Total ($\mu\text{mol/l}$)	260.73	4.828	180	2.7

* Short-term Maximum Allowable Concentration

- 7.22 Dredging is already carried out at least monthly for boats to access the jetty that the Applicant is proposing to use. There will not be any further dredges required specifically for the Project so no cumulative impacts need to be assessed.
- 7.23 The ES identifies the potential for scour from the discharge coming out of the outfall however the volumes of water are too small to alter the hydromorphology of the Humber Estuary. This view is not challenged by the EA or NE.
- 7.24 Condition 19 of the deemed marine licence within the DCO requires that a scheme to minimise the impact of the cooling water intake system on the aquatic environment has been submitted to and approved in writing by the MMO. This includes requirements for the details of the concentration of biocides in the water intake system and how they will be monitored and controlled. The Environmental Permit will include specific limits for a range of pollutants. These limits will ensure that they discharge does not detrimentally affect the potential of the receiving water body to meet achieve good status under the Water Framework Directive.
- 7.25 **The SoS agrees that this LSE will be mitigated through the requirement in the deemed Marine Licence (condition 19) and the Environmental Permit. The SoS is therefore satisfied that there would be no adverse effect on the Humber Estuary SAC from hydrological**

changes or fragmentation from the aqueous discharge into the Humber Estuary SAC/ SPA/ Ramsar.

Air quality

Air Quality impact on the Humber Estuary SAC from Construction

7.26 Construction of the project without mitigation was determined in the RIES as resulting in LSE through dust deposition. Dust arising from the construction of the fuel conveyor on the edge of the SAC boundary and contamination of the drainage systems flowing into the SAC from construction from the Gasification Plant, Power Island and Common Facilities. NE in their Statement of Common Ground agrees with the Applicant that the dust emissions during construction are negligible and there is not a potential impact on NKHP. **The Applicant has proposed to mitigate the construction impacts through the requirements for a Construction Environmental Management Plan, Requirement 15 of the DCO. The SoS is satisfied that there will be no adverse effect on the Humber Estuary SAC as a result of construction as dust emissions will be negligible and any potential LSE can be mitigated through Requirement 15 in the DCO.**

Air Quality impact on the Humber Estuary SAC from operation

7.27 The fuel unloading during operation of the Project will be an enclosed system to minimise dust emissions. This is considered by NE to be the best available technique and by dampening emissions at the point of extraction of the fuel this can minimise dust emissions with 98% efficiency. They do not consider that the release of dust is significant for NKHP and is approximately 0.2 kg/day for the whole unloading system. The Applicant has proposed to mitigate the dust impacts during operation of the Project through the requirements for a scheme for the control of dust emissions during operation, requirement 29 of the DCO.

7.28 The ES sets out that when operating as a CCGT power plant, the Project will be fired on natural gas. When operating as an IGCC power plant, a variety of fuels may be used to allow the Project to be fired on syngas. The variety of fuel mixtures include coal, either as a sole fuel or co-fired with petcoke or biomass, which is subjected to pre-combustion treatment producing the syngas. IGCC operation of the Project would need a solution for carbon capture and storage (CCS). Currently, a viable transport and storage system for CCS is not available. If the Project operates as an IGCC using biomass as fuel, this does not require CCS.

7.29 Operation of the Project from all the different methods of electricity generation proposed by the Applicant could impact on estuary habitats. This is from the release of pollutants including nitrogen oxide, carbon monoxide, sulphur dioxide and particulate matter (ES table 7.1). The EA identify that these emissions to air could impact on ecologically sensitive sites via an increase in the ground level concentrations of certain pollutants and the associated nutrient and acid

deposition. The Applicant identifies two SAC features that would be sensitive to this pollution namely reedbeds and mudflats.

- 7.30 The Applicant has modelled these potential impacts within the ES. This include nitrogen deposition and the increase in released NO_x into the atmosphere, for the scenario operating as a CCGT plant (scenario B & D), and operating as an IGCC plant (scenario E) with the impact of SO₂. The Project will not result in the release of SO₂ or particulate matter when operating as a CCGT plant. The Applicant concludes that air quality change during the operation of the development is not anticipated to have an adverse effect on integrity of the site because of the insignificant process contributions to ground level concentrations of NO_x and nutrient nitrogen / acid deposition as a result of the proposed mitigation measures.
- 7.31 The Applicant's ES also assess the emissions from the Flare Stack, however these will only be for a short duration, of less than 15 minutes under emergency conditions. There would also be a high release temperature of any gases which makes the emissions thermally buoyant. During start-up and shut-down the emissions will be much lower than during emergency situations. These short-term emissions are not further considered.
- 7.32 The deposition of sulphur and nitrogen at these sites has been assessed by the Applicant against the relevant critical load for acidification and nutrient enrichment, as identified using the Air Pollution Information System (APIS provides a comprehensive source of information on air pollution and the effects on habitats and species. APIS is a support tool for staff in the UK conservation and regulatory agencies, industry and local authorities for assessing the potential effects of air pollutants on habitats and species).
- 7.33 The Applicant states that the critical load for nutrient deposition within the Humber Estuary SAC is between 8-15 kg/ha/yr for the most sensitive habitats. The modelling carried out finds that there will be a peak of nutrient nitrogen deposition of 0.135 kg/ha/yr. This will occur 1.3 km north-east of the main stack. This location is within the middle of the Humber Estuary. Mudflats are not considered to be sensitive to nitrogen deposition only eutrophication, so the Applicant only further considered reedbeds. When the Project is operating under scenario B the Applicant considers that the peak of 0.135 kg/ha/yr, and 0.097kg/ha/yr under scenario E, will be dissipated within the water body so not affecting any sensitive terrestrial habitats under either scenario. They model that the deposition away from the peak will decrease to non-critical levels. In terms of the reedbeds within the estuary the lower end of their critical load from nitrogen is 10 kg/ha/yr. The Applicant found reedbeds growing to both the north and south of the existing jetties. The results showed that under the higher levels of deposition within scenario B as a CCGT plant the northern-most reedbeds were subject to 0.088 kg/ha/yr, which is 0.9 per cent of the critical load and the southern-most area of reedbeds were subject to 0.053 kg/ha/yr, which they calculate as 0.5 per cent of the critical load. Therefore no sensitive habitats were subject to above 1 % adverse changes due to nitrogen deposition.

- 7.34 EA guidance¹⁶ screens out impacts from long term process contribution where they are <1% of the long term environmental standard. They also screen out impacts where it is unlikely that an emission at a level above the standard will make a significant contribution to air quality since process contributions will be small in comparison to background levels, even if a standard is exceeded.
- 7.35 The ES section 7.5.91 discusses annual ground level concentration of NO_x. They have modelled that around the nearest and most sensitive terrestrial habitat concentrations will be 0.45 µg/m³ (0.31 µg/m³ in scenario E) which is 1.5 per cent of the critical level of 30 µg/m³ for the protection of vegetation and ecosystems under the Ambient Air Quality Directive 2008 as transposed into UK law by the Air Quality Standards Regulations 2010. The 2010 estimations from Defra report the existing baseline already at 44.1 µg/m³ so over the threshold. The Applicant's assessment does not predict impacts on the structure and function of the overall site. They give consideration to the size of the SAC and the distribution of sensitive habitats stretched over 100 km of the Humber, and the small change in NO_x levels at this location. They also note that there are existing high levels, and the envisaged percentage of NO_x will be limited to 1.0 per cent or equal to the accepted percentage threshold. Furthermore, the 30 µg/m³ limit is only strictly applicable when more than 5 km from an industrial installation.

Table 5 Extract from National air quality objectives and European Directive limit and target values for the protection of vegetation and ecosystems¹⁷.

Pollutant	Objective	Concentration measures as
Nitrogen oxides	¹⁸ 30 µg/m ³	Annual mean
Sulphur dioxide	20 µg/m ³	Annual mean
	20 µg/m ³	Winter average

The EA³ has also published Critical Levels for the Protection of Vegetation and Ecosystems. These standards only apply at nature conservation sites however for sulphur dioxide and nitrogen oxides they are similar to the thresholds above.

Table 6 Extract from Air Emissions annex F to Environment Agency guidance Environmental risk assessment for permits: overview.

Pollutant	Concentration µg/m ³	Measured as:
Sulphur dioxide	20	Annual mean for all higher plants
Nitrogen oxides (as NO ₂)	30	Annual mean
	75 ²	Daily mean

- 7.36 A key mitigation is the main stack height which needs to be constructed in agreement with article 3 of the DCO and requirement 5(1). The height can be up to 85 metres, and the height of the stack affects the dispersion of the gases. During operation of the Project, emissions can be

¹⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/298239/geho0410bsil-e-e.pdf

¹⁷ http://uk-air.defra.gov.uk/assets/documents/National_air_quality_objectives.pdf

¹⁸ 16 ppb in force since 19 July 2001 (total NO_x expressed as nitrogen dioxide). This is a critical value.

controlled and monitored (ES 6.6.8, 6.7.4 - 6.7.10). These limits will be regulated through the Environmental Permitting Regime. Environmental Permits are issued by the EA and can contain a range of conditions intended to achieve the objectives in the relevant UK and European legislation. These conditions can be detailed numerical limits on emissions or include restrictions on the type of materials the operator can handle. These conclusions are based on the interpretation of the Applicant's modelling data, which will be subject to further scrutiny by the Environment Agency during any environmental permit determination.

- 7.37 During the examination the EA advised that emissions can be regulated through an Environmental Permit. The height of the stack can go as high as set within the DCO and if further reduction is necessary to meet emission limit values; this can be done through abatement within the plant.
- 7.38 NE was satisfied in the Statement of Common ground that the Project will not be likely to result in air quality impacts on designated sites when the Project is considered alone. The EA was also satisfied that the project would not cause an impact alone. They did however feel there should be more consideration of in-combination effects. These are considered in more detail in section 8.
- 7.39 The Applicant has mitigated these impacts through adequate dispersion from the height of the main stack; control of dust emissions during operation including an Outline Coals Dust Management Plan; detailed design will require abatement within the Project to ensure a certain level of emission through for example the use of Dry Low NOx burners and Selective Catalytic Reduction in CCGT plant designs, or through gas turbine design proposed within the Applicant's ES. **Through article 3 and requirements 5 and 29 in the DCO, and the setting of conditions through the Environmental Permit, the SoS is satisfied that there will be no adverse effects on the Humber Estuary SAC/ SPA/ Ramsar from airborne emissions during the operation of the plant.**

Bird Disturbance impact on Humber Estuary SPA and Ramsar

- 7.40 The maximum area within which birds are likely to be subject to visual (or noise) disturbance during either construction or operation is considered to be 500m, (Ferns, 1992¹⁹; RPS, 2006²⁰; Cutts et al., 2008²¹). The susceptibility of birds to disturbance depends on the intensity, frequency and duration of the source of disturbance. In general, infrequent, high-intensity activities tend to cause more disturbance than continuous low-intensity activities (Hill et al., 1997²²). Although different species vary in their tolerance of disturbance, waterfowl are generally susceptible to disturbance and tend to preferentially select roosting or foraging sites where levels of disturbance

¹⁹ Ferns, P. N. (1992). *Birdlife of Coasts and Estuaries*. Cambridge University Press.

²⁰ RPS Glass Wool Plant Surveys / Able Humber Ports Facility – Coastal Birds Survey and Winter Farmland Bird Survey May 2006 to February 2007.

²¹ Cutts, N., Phelps, A. & Burdon, D. (2008). *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance*. Institute of Estuarine and Coastal Studies. Report to Humber INCA, October 2008.

²² Hill, D., Hockin, D., Price, D., Tucker, G., Morris, R. & Treweek, J., (1997) Bird disturbance: improving the quality and utility of disturbance research. *The Journal of Applied Ecology*, 34, No. 2, pp. 275-288.

are low (Hill et al., 1997¹¹). The nature of the disturbance response will range from head-raising, walking or swimming away to a flight response with no return.

- 7.41 The potential for visual disturbance has been assessed by the Applicant for both the construction and operation of the development, for the Humber Estuary EMS and relevant areas outside of the designated site that support interest features of the designated site. The Applicant's ES found that the area adjacent to the Project is important for SPA birds. These areas include land to the north of the Project as well as NKHP to the immediate south. NE highlight that the findings of up to 10,000 golden plover on land to the north of the development represents 2.5% of the GB wintering population, and exceeds the threshold for SPA classification in its own right. Also counts of curlew and lapwing represent significant proportions of SPA populations. NKHP is a significant roosting and feeding ground for waterfowl which occur in internationally important numbers in the Humber Estuary in winter.

Cooling Water Connection

- 7.42 Piling works required for the installation of the Cooling Water Connection within the Humber Estuary SPA will have the potential to result in disturbance to breeding and wintering birds present within the SPA.
- 7.43 The jetty that will be used by the Applicant for the cooling water intake and outfall is already subject to regular disturbance from ship movements, ballasting operations and at least monthly dredging. The RIES highlights studies that were carried out by Centre for Marine and Coastal Studies (CMACS) since 1995 to look at the impacts of C.RO Ports Killingholme. Their work has not shown impacts from these activities. The RIES explains the survey programme included quarterly measurements of current velocity, flow direction and sediment load immediately downstream of the terminal jetty, quarterly measurements of mudflat elevation, annual survey of the sediment, invertebrate in fauna and saltmarsh, and finally monthly bird surveys in six months of autumn and winter. The CMACS surveys found stable total bird numbers over the last four years despite the activities at CPK.

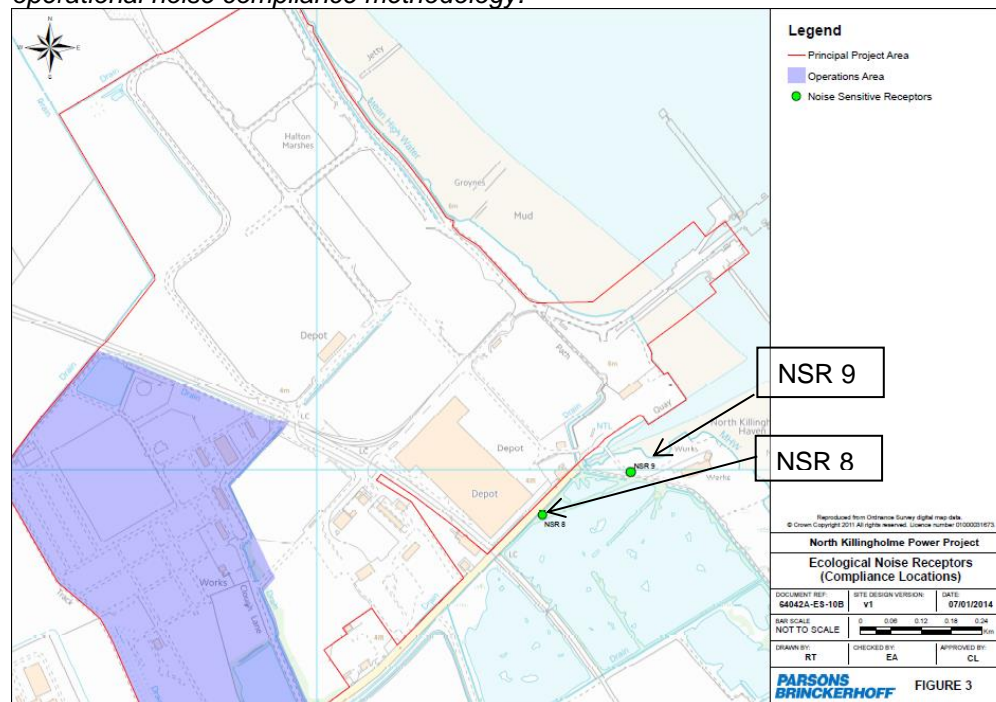
Fuel handling and conveyor systems - construction

- 7.44 During the examination in particular NE and the Lincolnshire Wildlife Trust in their relevant representation (20th June 2013) have raised concerns in respect of the fuel handling and conveyor systems, and their impact on NKHP and the populations of SPA/ Ramsar birds. These impacts are a LSE both during construction and operation of the fuel conveyor. The fuel conveyor will be located adjacent to the Humber Estuary SPA/ Ramsar.
- 7.45 The North Killingholme Haven Pits SSSI section of the SPA is known to support large numbers of SPA designated birds, especially during the winter and passage months (NE relevant representation). The NKHP is an important high tide bird roost, with peak numbers during the spring migration period (April) and the return passage period (August to October) (ES 7.5.60). The Humber INCA survey (ES 7.4.48) recorded 26 species of waterfowl and waders in NKHP

with teal, mallard, dunlin, black-tailed godwit and redshank in abundance. There have been particular concerns from NE about the impact on the population of black-tailed godwit. The Humber Estuary is important as their post-breeding moult site, with NKHP supporting up to 100% of the Humber Estuary SPA population of black-tailed godwit roosting during the autumn. Their numbers peak during the autumn, but they are still present over winter and in spring. NE were also concerned that if the birds were displaced that there are limited alternative roost sites to meet the birds requirements during the autumn.

7.46 Construction of the fuel conveyor may involve piling, which could disturb SPA birds within NKHP. Should piling be required it will take approximately 2 months. NE did not consider that there was a vibration impact due to the distance of NKHP from the activities. They evidence the ES 10.3.15 which states significant transient vibration is most likely within 20m of the piling activities and not within the NKHP.

Figure 4 Ecological Noise Receptors NSR 8 & 9, figure extracted from the Applicant's outline operational noise compliance methodology.



7.47 The Applicant's ES has assessed the worst case scenario of the construction noise levels at NKHP. The modelling was based on a reasonable worst case scenario, which assumes all activities are occurring simultaneously, which in practice is unlikely so construction noise levels should be lower than predicted. They found the highest predicted cumulative noise level to be 78.8 dB(A) (see Table 7). If there is no piling and the conveyor foundations are excavated rather than piled then the ES states the noise levels would be reduced by a further 4.8 dB.

Table 7 Extract from the ES Table 10.11: Cumulative Noise Assessment of all Construction Activities. NSR 8 & 9 are on the Northern boundary of NKHP adjacent to the fuel conveyor see Figure 4.

Calculated Sound Pressure Level from Construction Activities, dB(A)		
Receptor	NSR 8 (NKHP)	NSR 9 (NKHP)
Construction Noise from Operations Area	54.1	55.7
Construction Noise from CWI Option 1	55.2	55.0
Construction Noise from CWI Option 2	55.2	55.0
Construction Noise from CWI Option 3 and CCI	75.2	78.8
CWI Option 1 + Operations Area Cumulative	57.7	58.4
CWI Option 2 + Operations Area Cumulative	57.7	58.4
CWI Option 3 and CCI + Operations Area Cumulative	75.3	78.8

- 7.48 The Project will mitigate this impact by temporary acoustic screens being constructed along the length of the fuel conveyor (DCO requirement 26). This will reduce the noise from construction of both the piling activities as well as other construction noise at the receptor site by between 5 to 10dB. It will also provide a visual screen of the works to prevent visual disturbance (RIES), DCO requirement 26 also requires details of directional lighting in order to prevent light spill into NKHP. With this mitigation the noise levels fall below 70 dB(A) and construction thresholds advised by Cutts *et al.* 2008²³, thus NE had agreed in their statement of common ground that this is not significant.
- 7.49 The piling associated with the construction of the fuel conveyor would be limited to the January – March period (DCO requirement 26). A piling method statement is also required to ensure the protection of NKHP and the Humber SAP (DCO requirement 25). Requirement 51 of the DCO also ensure that construction outside the piling period from January to March shall not exceed a both a rating level of 56 dB, LAeq or mean maximum level of 75 dB L_{Amax} in a 12 hour period. The wording of this DCO requirement was agreed with NE who in their response to the RIES state that they are satisfied that there would be no adverse effect on NKHP through construction of the conveyor belt.
- 7.50 Placing seasonal restriction on the piling, a piling method statement, visual and acoustic screens will prevent the most significant noise disturbance associated with the fuel conveyor and handling systems. **Through the Requirements 25, 26 and 51 set out through the DCO the SoS is satisfied that there would be no adverse effect on bird features of the Humber Estuary SPA, from noise and visual construction disturbance.**

²³ Cutts, N., Phelps, A. & Burdon, D. (2008). *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance*. Institute of Estuarine and Coastal Studies. Report to Humber INCA, October 2008.

Construction disturbance outside the Humber Estuary SPA and Ramsar

- 7.51 The Applicant's ES found that the area adjacent to the Project is important for SPA birds. In particular the fields to the northwest of the operations area provide foraging and roosting for golden plover, curlew and lapwing. The Able Logistics Park will enhance these fields to provide optimal wet grassland habitats for waterbirds (NE's statement of common ground).
- 7.52 The ES includes a worst case noise contour plot based on all construction activities being undertaken at once. NE has reviewed this information and the wintering bird report within the ES. Their findings are that only a small population of birds are recorded in close proximity to the Project. These do not represent a significant proportion of the SPA population. Only Curlew were recorded within an area exposed to over 70dB, however this was within a large field and the area exposed to above 70dB was only 5.7 % of the field. This area was also adjacent to the Project site and railway line NE felt therefore ground feeding/roosting water birds would avoid these boundary features due to predation risk. NE did not necessarily agree with Cutts' threshold level, however agreed that the area potentially affected by increases in noise levels is small and sub-optimal for the SPA water birds.
- 7.53 Modelled noise levels within the ALP 'Core Mitigation Area' would be less than 50dB. The second phase of mitigation would be further away from the operation area so be subject to reduced noise levels of less than 35dB. These levels are below the construction thresholds prescribed by Cutts.
- 7.54 To mitigate effects of noise and visual disturbance the northern, eastern and north western boundaries of the operations area and construction laydown area will be screened with hoarding or barriers. This will be of at least 5m in height to screen the movement of people around the site. Slow moving cranes or slow construction of taller infrastructure are not considered to have a LSE (RIES). The hoarding will also be designed to reduce noise and light spill from the construction site.
- 7.55 **The SoS is satisfied that there would be no adverse effect on SPA/ Ramsar birds outside the designated site boundary from construction disturbance as only a small population of birds are recorded in close proximity and disturbance effects will be mitigated by using hoarding and barriers to screen operations. The mitigation is contained within requirements 30 and 49 of the DCO.**

Operational disturbance from the Project on the Humber Estuary SPA/ Ramsar

- 7.56 As part of the Project operational noise could have a LSE on the Humber Estuary EMS. In particular fuel deliveries from barge or train and operation of the fuel conveyor could cause noise and visual disturbance to the Humber Estuary SPA/ Ramsar. Fuel deliveries under different scenarios could be through a pipe conveyor belt from the existing wharfage area at CPK and train delivery using the Killingholme Branch railway line.
- 7.57 The ES states that the fuel deliveries by barge would be a maximum of 12 barges a week. These would only gain access to the wharf at high tide. This means they cannot disturb water birds

feeding within the inter-tidal estuary habitat around the jetty, as that would be inundated during this period. The RIES has also agreed with the CMAC surveys which indicate deliveries will have a negligible increase in disturbance over the baseline disturbance which doesn't have an apparent effect on the use of the inter-tidal habitat by the waterbirds. Fuel unloading will be via an enclosed system incorporating a continuous ship unloader. Operation of the fuel conveyor will, similarly, have no significant additional increase in noise generated by the Project at the foreshore (RIES). This report does not consider that this part of the operation would impact on the Humber Estuary SPA/ Ramsar. The fuel conveyor is adjacent to the NKHP and the ES finds that this will be the dominant source of noise impacts. The ES uses similar assessments points to the above construction noise assessments within the NKHP northern boundary

7.58 The operation of the fuel conveyor is the potential dominant source of noise impacts to NKHP from operational activity of the Project (RIES). Again the ES has assessed this impact and used NSR 8 and 9 to assess the noise impact as they are on the Northern boundary of NKHP adjacent to the fuel conveyor. The RIES states noise modelling predicts levels at NKHP as 53dB (LAed) at NSR8. This is also modelled showing a worst case scenario, with the receptor height based at 4m meaning the receptor receives direct sounds and sound reflected from the ground (NE statement of common ground).

Requirement 23 of the DCO set operational noise limits on the Project and requirement 21 requires a monitoring programme for noise from the operation of the Project.

Extract of noise limits from requirement 23 below:

<i>Location</i>	<i>Rating Level $dB_{LAeq 1 \text{ hour}}$</i>
NSR8	53
NSR9	47

7.59 Train movement through NKHP could lead to visual as well as noise disturbance of the water birds feeding and roosting in the site (Lincolnshire Wildlife Trust). The susceptibility of birds to disturbance depends on a number of factors including intensity, frequency and duration of the source of disturbance.

7.60 The ES states that rail delivery option for solid fuel would increase train movements on the railway. The railway runs between the Principal Project Area and Immingham. During the examination the assessment of impact was increased to a maximum of 16 train deliveries per day. The type of train that will be used is identified in the ES as a Class 66 diesel locomotive pulling twelve bottom-emptying coal wagons, each with a 73 tonne carrying capacity. These would be unloaded in an enclosed facility to minimise noise.

7.61 The trains will pass slowly through the NKHP and their speed will be limited to 10 km/h, secured through requirement 48 of the DCO. The Applicant provided predicted noise impacts onto NKHP within their ES and further information was provided in response to the examining authority's second written questions. The RIES identifies that these plots show a significant noise reduction can be achieved by reducing train speeds to 10 km/h through NKHP. The anticipated noise from trains would only be >45 dB LAeq within about 25m of the railway line.

- 7.62 Visual disturbance from the movement of trains could disturb and displace the important populations of water birds on NKHP (RIES). NE's opinion is that can be mitigated through planting adjacent to and north of the Killingholme Branch Railway Line as it passes NKHP. This planting will fully screen the rail corridor from NKHP effectively removing any visual disturbance. This is secured through requirement 50 of the DCO.
- 7.63 The SoS agrees with the ExA that, in the absence of any mitigation, there remains doubt as to whether black-tailed godwits and other SPA/ Ramsar water bird features would habituate to train movement. The evidence of habituation provided by the Applicant was not species specific, not specific to large numbers of birds roosting during their autumn moult and not directly comparable to the site conditions at NKHP. The Applicant refers to the Exe Estuary Trail Ornithology Monitoring Reports and the National Cycle Network, Exe Estuary cycleway monitoring within their response to the Examining Authority's second written questions. NE's concerns are set out in their statement of common ground, where they note that there is a lack of literature on the impact of train movement. They felt evidence was needed in particular as to the species that might be impacted at NKHP and those at roost during their autumn moult. The SoS agrees with NE's advice.
- 7.64 However, the combined reduction of train speeds to 10 km/h secured by requirement 48 of the DCO and additional visual screening in requirement 50 enabled NE to conclude no adverse effects on roosting black-tailed godwits in NKHP.
- 7.65 In NE's response to the RIES they also confirm that they would be satisfied if the screening was provided through planting or other measures to provide visual screens. If measures were used that didn't include planting these would also need maintaining.
- 7.66 **The SoS is satisfied that there will be no adverse effect on bird features of the Humber Estuary SPA/ Ramsar from operation disturbance as a result of mitigation measures to reduce train speeds and provide visual screening. The mitigation is contained within the DCO Requirements 21, 23, 48 and 50.**

8 Assessment of effects of the Project in-combination with other plans and projects

Bird Disturbance

- 8.1 The RIES has considered the assessments undertaken as part of the AMEP proposal. Able UK's assessment predicts an LAeq value of 53dB at North Killingholme Haven Pits. The Applicant has considered the noise impact of the operation of its Project (including from train movements and the fuel conveyor) in-combination with the AMEP proposal. This assessment predicts a total noise level of 56dB at NKHP (NSR 8, see Figure 4), which would therefore represent an increase of approximately 3dB against the future baseline. Therefore, the Applicant predicts that the noise impact will result in a negligible increase above the predicted future baseline.
- 8.2 Within NE's Statement of Common Ground, NE agrees that 'any potential (operational) impacts have been adequately assessed and addressed where necessary'. NE did not agree with the in-combination assessment presented by the Applicant. The Applicant has assessed the impacts from the Project not to be adverse and also looked at other developments which have also not been found to have a significant impact on the integrity of the Humber Estuary EMS, they therefore conclude that there is no in combination impact. NE disagreed with this approach and state that the tests of the Habitats Regulations require that the potential impacts of a development are first considered alone to determine if they are likely to have a significant effect on a European site. If there is no likelihood of significant effects alone, then the development should be considered in combination with other plans and projects to determine if the combined effect of the proposals are significant. Therefore the 'not significant' impacts of one development cannot always combine with the 'not significant' impacts of another development to equal an in-combination effect which is always not significant. This is to ensure the in combination assessment avoids many small impacts combining together to impact on the site. NE advised that potential disturbance to North Killingholme Haven Pits from the Project should be considered in combination with potential disturbance from AMEP. However following the further mitigation applied where necessary, NE then agree that there are no longer any significant in-combination effects.
- 8.3 NE also looked at the in-combination assessment of the effects anticipated from the Project from the Gas Connection. The proposed route for the gas connection runs alongside East Halton Dismantled Railway Local Wildlife Site, which supports SPA birds including curlew. They advised that if works were carried out between March and July inclusive, there would be no effect on the Humber Estuary SPA/ Ramsar features and therefore there is no requirement to undertake an in combination assessment. As agreed in the Statement of Common Ground, the Applicant will include this seasonal restriction in its submission to the Local Planning Authority for the gas connection works.

- 8.4 **Different sources of potential disturbance from the Project are mitigated through a number of Requirements 25, 26, 30, 31, 48, 49, 50 and 51. The SoS therefore concludes that the predicted noise impacts will not have an adverse impact on the Humber Estuary SPA/ Ramsar water bird interest features alone or in-combination with other plans and projects.**

Hydrological change

- 8.5 The Applicant identifies the next closest outfalls as Centrica and E.ON Killingholme Power Stations which are more than 500 m south east of the jetties and therefore concludes there are no significant interactions expected with the operation of the existing Power Stations. The tidal nature of the Humber Estuary and the abstraction/ discharge points for the Project mean that there are no plume interaction predicted in the ES between the Project and the other discharge points. The EA in its relevant representation confirms that they are satisfied that the proposed thermal discharge zone of effect will not interact with existing thermal discharges.
- 8.6 **The SoS agrees with the EA's advice and concludes that the predicted impacts from the Project's intake and outfall are not considered to have an adverse impact on the integrity of the Humber Estuary SAC/ Ramsar alone or in-combination with other plans and projects.**

Air Quality

- 8.7 The RIES does not find an adverse effect on integrity of the Humber Estuary EMS. In the examination NE acknowledged the Applicant's arguments that there should be no opportunity for significant in-combination effects with emissions from existing developments provided that these other emissions are appropriately reflected in background measurements used for air quality assessment. The EA were satisfied with the conclusion for the purposes of the planning decision and note that these emission will be subject to further operational regulation through the Environment Permit where the EA will require more detail and further validation of air dispersion models. The EA's comments on the RIES state that they are not aware of anything that would preclude the grant of an Environmental Permit but did caveat that their view could change depending on the content of the permit application.
- 8.8 During the examination the EA advised that emissions can be regulated through an Environmental Permit. The in-combination assessment for their Environmental Permit will need to include the impact on air quality of their emissions in combination with those of adjacent industry, including Centrica and E.ON Killingholme power stations and Total UK and Philips 66 oil refineries. The height of the stack may extend to a maximum of 85m as set within the DCO limits and if further emission reduction is necessary to meet emission limit values this can be done through abatement within the plant. The interpretation of modelling data will be subject to further scrutiny during any environmental permit determination by the EA.

8.9 The SoS therefore concludes that as protection is afforded through the Environmental Permitting regime this will ensure the operation of the Project will not be allowed if there is a risk of adverse effects on the integrity of the site alone or in-combination with other plans and projects.

9 Conclusions

- 9.1 This Appropriate Assessment has been undertaken by the SoS as the Competent Authority in respect of the Project known as the “North Killingholme Power Project” as required by Regulation 61 of the Conservation of Habitats and Species Regulations 2010.
- 9.2 The SoS is satisfied that the Applicant (C.GEN Killingholme Ltd) has provided information to enable a robust judgement to be made on the LSE stemming from the construction and operation of the proposed 470 megawatt electrical generating station, both alone and in combination with other plans and projects.
- 9.3 The SoS notes that the development site is located adjacent to (and in small part within) the Humber Estuary European Marine Site made up of the Humber Estuary SAC/SPA/Ramsar site. The Humber Estuary supports significant numbers of wintering and passage migrant SPA and Ramsar birds species that are qualifying species for the Humber Estuary designated site.
- 9.4 The assessment has considered the potential for significant effects from the project alone and, where appropriate, in-combination with other projects, in both construction and operation.
- 9.5 The assessment has assessed effects relating to: habitat loss; fragmentation; air quality; hydrological changes; mortality; disturbance (noise and visual), taking account of the conservation objectives for the site, with the aim of determining whether it can be shown that the Project, as proposed and with the conditions and requirements described, will not have an adverse effect on the integrity of the Humber Estuary SAC/SPA/Ramsar site.
- 9.6 The assessment has identified that significant effects (before mitigation) are likely, or cannot be discounted, from the project alone and in-combination with other projects in relation to the following impacts:
- Habitat loss
 - Fragmentation
 - Air quality
 - Hydrological changes
 - Mortality
 - Disturbance
- 9.7 In coming to his conclusions, the SoS is confident that the application of the mitigation measures contained in the DCO requirements and the environmental permitting regime administered by the EA will ensure no adverse effects on the integrity of the Humber Estuary SAC/SPA/Ramsar site.
- 9.8 The SoS places weight on NE’s advice that they are satisfied with the wording of relevant (see 9.9) mitigation measures detailed in the DCO Requirements. They do not raise any concerns with the findings of the RIES and advise that the DCO requirements will ensure no adverse effect on the integrity of the Humber Estuary SAC/SPA/Ramsar site from the Project alone and in combination. NE also confirm that wording of requirement 51 to control the construction noise, from the conveyor belt, at North Killingholme Haven Pits was agreed in discussion with NE and

(in conjunction with DCO requirement 26) they were satisfied that there will be no adverse effect on North Killingholme Haven Pits arising through construction of the conveyor belt.

9.9 Mitigation for the Project to protect the Humber Estuary EMS will be secured and delivered through the following DCO requirements:

- Requirement 15 - Construction Environmental Management Plan;
- Requirement 21 – Control of noise during operations – monitoring;
- Requirement 23 – Control of noise during operations – noise limits;
- Requirement 25 - Piling;
- Requirement 26 - Construction of Work Nos. 6a and 6b;
- Requirement 29 - Control of dust emissions during operation;
- Requirement 30 - Construction and security lighting scheme;
- Requirement 31 – Permanent Lighting Scheme;
- Requirement 43 – Decommissioning;
- Requirement 48 - Train speed at NKHP;
- Requirement 49 - Acoustic hoarding;
- Requirement 50 - Visual attenuation of train movements;
- Requirement 51 - Control of construction noise at North Killingholme Haven Pits.
- Deemed Marine Licence condition 19 – Cooling water intake
- Deemed Marine Licence condition 20 – 23 Piling conditions

9.10 The Secretary of State is confident that there will be no adverse effects on the integrity of the Humber Estuary SAC/SPA/Ramsar sites through airborne emissions or aqueous discharges in view of this mitigation and the protection secured by the Environmental Permitting regime. The EA is considering an application for an Environmental Permit for the operation of the Project and indicated during the Examination process that the project is of a type and nature that in principle should be capable of being permitted, and that it is not aware of anything that would preclude the grant of an environmental permit (though its decision will of course be subject to the contents of the permit application). Under the Environmental Permitting regime, in order to operate, a more detailed assessment of the operational impacts will be undertaken to agree the final design and regime. As part of that process the EA as a competent authority for the Habitats Directive will carry out a further Habitats Regulations Assessment. The Environmental Permit issued by the EA is necessary prior to the commencement of operations.

9.11 **The Secretary of State concludes that the construction and operation of the 470 megawatt electrical generating station, referred to as the ‘North Killingholme Power Project’, as proposed, with all of the proposed avoidance and mitigation actions being implemented in full, will not adversely affect the integrity of the Humber Estuary SPA, Humber Estuary Ramsar site or Humber Estuary SAC either alone or in combination with other plans or projects.**

9.12 This Appropriate Assessment is positive; there is therefore no necessity for discussion of alternatives or Imperative Reasons of Overriding Public Interest.

Author: Toni Scarr, Environmental Manager

National Infrastructure Consents Team, Department of Energy and Climate Change

Date: September 2014

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Annex A

Table 8 features of European and International Sites

Designated Site	Qualifying Features
Humber Estuary Special Area of Conservation	<ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks • Estuaries • Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats • Coastal lagoons* • <i>Salicornia</i> and other annuals colonising mud and sand • Glasswort and other annuals colonising mud and sand • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) • Embryonic shifting dunes • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes"); Shifting dunes with marram • Fixed dunes with herbaceous vegetation ("grey dunes"); Dune grassland* • Dunes with <i>Hippophae rhamnoides</i>; Dunes with sea-buckthorn • <i>Petromyzon marinus</i>; Sea lamprey • <i>Lampetra fluviatilis</i>; River lamprey • <i>Halichoerus grypus</i>; Grey seal
Humber Estuary Special Protection Area	<ul style="list-style-type: none"> • <i>Botaurus stellaris</i>; Great bittern (Non-breeding) & (Breeding) • <i>Tadorna tadorna</i>; Common shelduck (Non-breeding) • <i>Circus aeruginosus</i>; Eurasian marsh harrier (Breeding) • <i>Circus cyaneus</i>; Hen harrier (Non-breeding) • <i>Recurvirostra avosetta</i>; Pied avocet (Non-breeding) & (Breeding) • <i>Pluvialis apricaria</i>; European golden plover (Non-breeding) • <i>Calidris canutus</i>; Red knot (Non-breeding) • <i>Calidris alpina alpina</i>; Dunlin (Non-breeding) • <i>Philomachus pugnax</i>; Ruff (Non-breeding) • <i>Limosa limosa islandica</i>; Black-tailed godwit (Non-breeding) • <i>Limosa lapponica</i>; Bar-tailed godwit (Non-breeding) • <i>Tringa totanus</i>; Common redshank (Non-breeding) • <i>Sterna albifrons</i>; Little tern (Breeding) • Waterbird assemblage of international importance (In the non-breeding season the area regularly supports: 153934 waterfowl (5 year peak mean 1996/7 to 2000/1) Including: <i>Teal, Widgeon, Mallard, Turnstone, Common pochard, Scaup, Bittern, Brent</i>

Designated Site	Qualifying Features
	<p><i>Goose, Goldeneye, Sanderling, Dunlin, Knot, Ringed Plover, Oystercatcher, Bar-tailed godwit, Black-tailed godwit, Curlew, Whimbrel, Ruff, Golden Plover, Grey Plover, Avocet, Shelduck, Greenshank, Redshank, Lapwing.</i></p>
<p>Humber Estuary Ramsar site</p>	<p>Criteria 1: The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons.</p> <p>Criteria 3: The site supports England's second largest breeding colony of grey seals <i>Halichoerus grypus</i> at Donna Nook. The dune slacks at Saltfleetby-Theddlethorpe are the most north-easterly breeding site in Great Britain of the natterjack toad <i>Bufo calamita</i>.</p> <p>Criteria 5: Assemblages of international importance: 153,934 waterfowl, non-breeding season.</p> <p>Criteria 6: species/populations occurring at levels of international importance.</p> <p>Species with peak counts in spring/autumn: Eurasian golden plover, <i>Pluvialis apricaria Altifrons</i>; Red knot, <i>Calidris canutus Islandica</i>; Dunlin, <i>Calidris alpine Alpine</i>; Black-tailed godwit, <i>Limosa limosa Islandica</i>; Common redshank, <i>Tringa tetanus Brittanica</i>;</p> <p>Species with peak counts in winter: Common shelduck, <i>Tadorna tadorna</i>; Eurasian golden plover, <i>Pluvialis apricaria Altifrons</i>; Red knot, <i>Calidris canutus Islandica</i>; Dunlin, <i>Calidris alpine Alpine</i>; Black-tailed godwit, <i>Limosa limosa Islandica</i>; Bar-tailed godwit, <i>Limosa lapponica Lapponica</i>;</p> <p>Criteria 8: The Humber Estuary acts as an important migration route for both river lamprey <i>Lampetra fluviatilis</i> and sea lamprey <i>Petromyzon marinus</i> between coastal waters and their spawning areas.</p>