



Able Marine Energy Park

Material Change 2

Supporting Documents

relating to Cumulative

Assessment

(referenced in response to question

13.0.1)

Hedon Haven Development



Project Title:

HUMBER INTERNATIONAL ENTERPRISE PARK

Client:

ABP

Legend:

Legend



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18. Cumulative and Combined Effects

18.1 Introduction

- 18.1.1 This chapter of the Environmental Statement (ES) addresses the potential for combined or cumulative effects to occur as a result of the Proposed Development. It draws on the assessment of impacts provided in Chapters 6 to 18 of this ES, and information relating to other known developments that are proposed within the study area. This assessment does not consider developments that are already constructed and operating for the assessment of cumulative effects, as existing operational facilities are accounted for in the baseline conditions established for the main assessments within Chapters 6 to 17.
- 18.1.2 **Combined effects** may arise where several different effects resulting from the Proposed Development (e.g. decrease in air quality, increase in noise disturbance) have the potential to affect a single receptor.
- 18.1.3 **Cumulative effects** have the potential to arise where two or more developments are proposed within close enough proximity to lead to effects of the same type (e.g. air quality) on the same receptor.
- 18.1.4 The cumulative effects assessment therefore considers other proposed developments that are in the public domain, such as planning applications registered with the local planning authorities and/or already consented developments that are not yet constructed or operational.
- 18.1.5 This chapter is supported by Figure 18.1 (ES Volume II).

18.2 Legislation and Planning Policy Context

Legislation

- 18.2.1 The requirement for cumulative and combined impact assessments is clearly stated in the relevant European Directive and domestic legislation as detailed below:
- European Directive 2011/92/EU on the assessments of effects of certain public and private projects on the environment requires an assessment of *“the direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent or temporary, positive and negative effects of the project”*, and
 - Schedule 4 Part 5 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (‘the EIA Regulations’) states the following:
*“A description of the likely significant effects of the development on the environment resulting from, inter alia: ...

(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources”*

National Planning Policy

- 18.2.2 The need to consider cumulative effects in planning and decision making is set out in planning policy, including the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2018) and the Planning Practice Guidance (PPG) (Ministry of Housing, Communities and Local Government, 2017), which states
“Each application (or request for a screening opinion) should be considered on its own merits. There are occasions, however, when other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development.” (paragraph 024, reference ID 4-024-20170728)

18.3 Assessment Methodology and Significance Criteria

Impact Assessment and Significance Criteria

- 18.3.1 There is no standard prescriptive method for assessing cumulative and combined effects. With regard to cumulative effects, the ability to quantify the extent to which the environmental effects of other developments can interact with those associated with the Proposed Development depends upon the level of information available regarding such other developments. Where environmental assessment information regarding other developments is not available or is uncertain, the cumulative assessment is necessarily qualitative and assessment is primarily based upon professional opinion.
- 18.3.2 When considering cumulative and combined effects, the mitigation measures as set out in Chapters 6 to 17 were taken into account i.e. only residual (after mitigation) effects are discussed in this chapter.
- 18.3.3 With regard to the assessment of combined effects, this has taken account of the assessment findings reported within Chapters 6-17 of this ES and the ability of identified impacts to interact and impact upon common receptors.
- 18.3.4 The assessment has been guided by the following considerations in respect of cumulative and combined effects:
- understanding the temporal and spatial limits of the effects associated with the Proposed Development and those of other development projects;
 - the sensitivity, value or importance of resources or receptors, and their susceptibility to effects;
 - whether different types of effect would occur and interact in a way that alters their significance;
 - whether effects that are identified would be temporary or permanent in duration, what their timescales would be, and whether the frequency of such effects would be intermittent or constant;
 - whether effects that are identified would require any additional mitigation in order to reduce their significance; and
 - the degree of certainty relating to identified effects.
- 18.3.5 Cumulative and combined effects were assessed to be neutral, minor, moderate or major and adverse or beneficial. Moderate or major effects are considered to be significant, using the methodologies outlined in each technical chapter (Chapters 6 – 17 of this ES).

Cumulative Effects

- 18.3.6 Cumulative effects are those that accrue over time and space, caused by the interaction of impacts associated with a number of developments. In the absence of specific guidance on cumulative effects assessment for applications made under the EIA Regulations, the framework provided by the Planning Inspectorate in their Advice Note 17 'Cumulative Effects Assessment' (Planning Inspectorate, 2015) is considered to provide a useful framework. Although specifically aimed at nationally significant infrastructure projects (NSIP) classified under the Planning Act 2008, and whilst it is recognised that the Proposed Development is not a NSIP, the approach set out in this document has been adapted for the purposes of the cumulative effects assessment reported in this chapter.
- 18.3.7 A four stage approach to the assessment of cumulative effects has been adopted in accordance with Advice Note 17:
- Stage 1: identify the Zone of Influence (ZOI) of the Proposed Development;
 - Stage 2: identify a list of other developments for consideration on the need for cumulative assessment, including through consultation;
 - Stage 3: information gathering on the short-list to determine likelihood of cumulative effects; and
 - Stage 4: assessment where cumulative effects are considered likely.

- 18.3.8 The Zone of Influence is discussed in the Study Area section below. An initial screening of other developments was undertaken prior to the submission of the EIA Scoping Report and the 'other developments' identified listed within it (see Appendix 1A).
- 18.3.9 In order to assess the potential for cumulative effects to arise in relation to these developments, where a planning application has been made, information presented within the ES or environmental reports for the development has been gathered and reviewed. For developments that are known to be proposed (either via screening or scoping opinion requests submitted to the local authority or following presentation of information in the public domain) but where an ES (or other environmental reports) has not yet been prepared or submitted, any readily available information has been utilised. This includes communication with local authorities, public consultation material and material available via the internet.
- 18.3.10 Following information gathering from available resources (including review of documents submitted to support planning applications/DCO applications for other developments), the effects of the Proposed Development have been considered in conjunction with the potential effects from other projects or activities that are both reasonably foreseeable in terms of delivery (e.g. have planning consent or are in the planning process) and are geographically located in a position where environmental impacts could act together to create an effect that is more (or less) significant overall than the effect of individual developments alone.
- 18.3.11 Operational impacts are generally long-term, and whilst construction impacts are often short term and temporary, they can potentially be of a large magnitude. Consequently, when cumulative effects that could be associated with construction at one site and operation at another are considered, the difference in duration and reversibility is considered within this assessment.
- 18.3.12 In assessing cumulative effects, it is appropriate to also acknowledge the relative contributions that different projects make to a cumulative effect, and carefully consider whether a cumulative effect occurs at all. For example, effects associated with a large scale project may be significant, and whilst a smaller project may contribute to this effect, the cumulative effect of the smaller project and the larger project is only considered to be significant if it is of greater significance than the effect of either project in isolation.
- 18.3.13 Where applicable, the assessment considers all other known developments that have potential for cumulative effects with the Proposed Development together, as a worst case. As such, not all of the other developments considered are "*existing and/or approved projects*" as required by the EIA Regulations. This is consistent with the guidance provided in the Planning Inspectorate Advice Note 17 (Planning Inspectorate, 2015), which suggests that assessment should include consideration of submitted planning applications that are not yet determined and projects for which an EIA Scoping Report has been submitted.

Study Area

- 18.3.14 Cumulative effects are generally unlikely to arise unless the other proposed development sites are in close proximity to the Site, recognising that actual distance varies with the nature of the receptor, e.g. cumulative air quality effects could occur for developments a greater distance apart than noise effects. Construction projects are, as a matter of routine, required to employ regulatory and managerial controls and employ good practice to mitigate construction impacts wherever possible. Nevertheless, consideration has been given to the presence of common pathways from nearby developments to a single receptor, and whether there is potential for impacts of a sufficient magnitude whereby a particular receptor could experience cumulative effects.
- 18.3.15 The study area for the consideration of cumulative and combined effects has been developed taking into account the predicted extent of impacts associated with the Proposed Development, and with the point at which the associated effects become insufficient to contribute in any meaningful way to those of another proposed development.
- 18.3.16 The study area for each environmental assessment topic is defined in the relevant technical chapter (Chapters 6-17). The largest study areas, for the ecological and landscape and visual impact assessments, has defined the 'zone of influence' within which the search for other developments has been undertaken for the cumulative assessment. Given the generally flat nature of the surrounding landscape, other developments within a 10 km zone of influence have been identified.

18.4 Consultation

18.4.1 A summary of the consultation relevant to the cumulative and combined effects assessment is provided in Table 18.1 below.

Table 18.1: Consultation summary

Consultee or organisation approached	Date (Method)	Summary of consultee response	Summary of response
East Riding of Yorkshire Council	23 rd October 2018 (Scoping Opinion)	The East Riding of Yorkshire council responded that the proposed approach for cumulative and combined effects assessment is considered acceptable. Plans and projects in the wider sub-region should also be considered.	A cumulative assessment has been undertaken, considering all other current proposals within the immediate surrounding area and wider sub-region.
Natural England	September 2018 (Scoping Opinion)	Natural England commented that all supporting infrastructure should be included within the assessment, with particular consideration given to Yorkshire Energy Park. Natural England commented that the ES should include an impact assessment to identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that have been or are being carried out.	A cumulative assessment has been undertaken including all supporting infrastructure, and particular consideration has been given towards Yorkshire Energy Park.
East Riding of Yorkshire Council Public Protection	(Scoping Opinion)	The Environmental Control Specialist commented that potential combined and cumulative effects will need to be considered from all relevant committed development and not be restricted to those schemes identified in the scoping report.	A cumulative assessment has been undertaken considering all committed developments identified in the surrounding area.
RSPB	12 th September 2018 (Scoping Opinion)	The RSPB commented that potential in combination and cumulative impacts will need to be fully identified and addressed in the Environmental Statement because there is the potential for in combination effects on SPA birds with the nearby Yorkshire Energy Park Project.	An assessment has been undertaken to identify potential cumulative and combined effects with nearby developments.
Yorkshire Wildlife Trust	6 th September 2018 (Scoping Opinion)	Yorkshire Wildlife Trust commented that an appropriate assessment of the impacts the Proposed Development will have in combination with nearby proposed developments, Yorkshire Energy Park in particular, should be undertaken.	An assessment has been undertaken to identify potential cumulative and combined effects with nearby developments.

Consultee or organisation approached	Date (Method)	Summary of consultee response	Summary of response
GVA (Yorkshire Energy Park)	September 2018 (Letter regarding EIA Scoping Report)	GVA strongly recommend that the potential cumulative effects with the Yorkshire Energy Park are taken into consideration. GVA also list other proposed developments for which potential cumulative effects should be considered.	A cumulative assessment has been undertaken, giving consideration to the Yorkshire Energy Park project and a number of additional developments.

18.5 Cumulative Effects Assessment (Stages 1-3)

- 18.5.1 Following the initial screening and subsequent consultation, a long list of potential major developments was produced. This process involved a search of both the East Riding of Yorkshire Council Planning Portal website and the Planning Inspectorate website in order to identify potential major developments within a 10km radius to create a long list for consideration.
- 18.5.2 This long list has subsequently been screened based on the potential for cumulative impacts (e.g. cumulative landscape and visual impacts have potential to occur over a greater distance than, for example, cumulative archaeology impacts) and this screening is reflected in Table 18.2, along with details of the current status of each development and comments regarding their anticipated timing in relation to the anticipated timescales of the Proposed Development. In cases where it has been determined that there is insufficient information available about a proposed development, these have been screened out of the cumulative impact assessment as no meaningful assessment can be undertaken.

Table 18.2: Other proposed developments within 10 km of the Site

Name of Development	Approximate distance from site (m)	Status (at time of assessment)	Description of development	Overlap in temporal scope	Scale and nature of development likely to have a significant effect?	Include in cumulative assessment?	Environmental information available to inform assessment
Saltend Chemicals Park (18/00292/STPLF)	180 m west	Application approved	Installation of infrastructure to allow the Import and Storage of Acetic Acid comprising: 1) Construction of an Import Pipeline; 2) Construction of a concreted Tank Bund; 3) Construction of 2 Above Ground Storage Tanks (maximum height 30m); 4) Ancillary Infrastructure including pipework, process pumps, pipe supports, electrical switchroom and effluent management	No information on construction schedule provided.	The development will be constructed within the existing Saltend Chemicals Park. The implementation of appropriate mitigation measures will ensure that there are no significant effects.	Yes	Flood Risk Assessment (FRA), environmental briefing document, Habitat Regulations Assessment (HRA).
Paull Local Development Order (12/04951/LDOC)	On Site	Approved in 2012. Now expired and renewal in determination.	Local Development Order (LDO) granting outline planning permission for the erection of buildings and/or the use of land for Class B2 (General Industrial) Uses of the Town and Country Planning (Use Classes) Order 1987 (and its subsequent amendments), specifically uses associated with port related renewable and low carbon industries on 80 hectares of agricultural land between Saltend and Paull (Local Development Order is accompanied by an Environmental Impact Assessment).	The LDO is within the Site and included as part of the Proposed Development for completeness.	The proposed LDO developments form part of the Proposed Development so there is no need to assess cumulative effects as the effects have already been considered in Chapters 6-17.	No	Integrated Environmental Assessment Report (comprising EIA, FRA and Transport Assessment (TA))
Hull Local Development Order (17/00173/LDO)	1 km north-west	Approved in 2012 and renewed in 2018	LDO granting outline planning permission for the erection of buildings and/or the use of land for Class B2 use, specifically uses associated with renewable and low carbon industries, on land at Alexandra Dock and Queen Elizabeth Dock. Permission covers access and uses falling both: 1. within B2 (General Industrial uses) of the Town and Country Planning (Use Classes) Order 1987 (and its subsequent amendments), (excluding incineration purposes, heat treatment of waste ,energy	Potential for construction and operation phases to overlap.	Some of the Hull LDO land has already been developed as Green Port Hull. Development of the remainder of the LDO area has potential for cumulative traffic impacts (which are already assessed in Chapter 6: Traffic and Transport as the Hull LDO is included in the future baseline) but given the distance from the Site no other potentially significant	No	Integrated Environmental Assessment Report (comprising EIA, FRA and TA)

Name of Development	Approximate distance from site (m)	Status (at time of assessment)	Description of development	Overlap in temporal scope	Scale and nature of development likely to have a significant effect?	Include in cumulative assessment?	Environmental information available to inform assessment
			generation, chemical treatment or landfill or hazardous waste), and including office, research and development, light industry, and storage uses ancillary to the main industrial use (see Definitions below); and 2. being uses associated with renewable and low carbon industries.		cumulative effects are likely.		
Salt End Hybrid Natural Gas Production and Energy Storage Facility (17/03771/STPLF)	650 m north-west	Approved in 2017	Construction of a hybrid natural gas production and energy storage facility with a maximum capacity of 49 megawatts to include gas generators, battery storage units, transformers, sub-station compounds, switch room, gas kiosk and welfare cabin with associated access, parking and security fencing.	No information on construction schedule provided.	The development will be constructed within the existing Saltend Chemicals Park. The implementation of appropriate mitigation measures will ensure that there are no significant effects.	Yes	Flood Risk and Drainage Assessment, Ecological Appraisal, Noise Assessment, Transport Statement, Air Quality Assessment, Landscape and Visual Amenity Appraisal and Ground Conditions study
A63 Castle Street Improvement, Hull	8 km west	Development Consent Order Pre examination	Improvement of a 1 mile (1.5 km) stretch of the A63 at Castle Street by lowering the level of the road into a cutting by approximately 7 m at Mytongate Junction. Ferensway and Commercial Road would pass over, being raised by approximately 1 m, creating a split level junction. The project will also widen the eastbound carriageway to three lanes between Mytongate and Market Place.	A decision has not yet been made.	The scheme is intended to reduce delays through Hull and improve journey times. There is the potential for significant noise effects during construction, along with significant archaeological, ecological, and landscape and visual effects.	Yes	ES
River Humber Gas	3.5 km south-	Development	The replacement of a c. 6 km natural gas	No,	No, construction of the River	No	ES

Name of Development	Approximate distance from site (m)	Status (at time of assessment)	Description of development	Overlap in temporal scope	Scale and nature of development likely to have a significant effect?	Include in cumulative assessment?	Environmental information available to inform assessment
Pipeline Replacement Project (Ref: EN060004)	west	Consent Order submitted and approved in 2017. Construction commenced	transmission pipeline, housed within a tunnel beneath the Humber Estuary commencing approximately 2 miles north east of Goxhill, North Lincolnshire, terminating approximately 1 mile south east of Paull, East Riding of Yorkshire	construction to be completed by 2019.	Humber Gas Pipeline has already commenced and its anticipated to be completed by 2019. Therefore, significant cumulative effects are unlikely.		
Yorkshire Energy Park (17/01673/STOUT E)	50 m north	Pending determination	Outline planning application for development of the site for mixed use comprising a business park (B1a, B1b, B1c, B2, B8) and an education, training and research campus (incorporating outdoor building materials testing facility) and associated residential accommodation (B1a, B1b, D1 and Sui Generis); on-site energy infrastructure (providing energy to on-site users) (Sui Generis), offsite energy infrastructure (generating energy to export into the grid) (Sui Generis), with generation from on-site energy infrastructure and off-site energy infrastructure totalling less than 50MW), and a primary substation (Sui Generis); data centre (600 racks) and associated disaster recovery suite (B1a and Sui Generis); relocated sports facilities (D2); landscaping and open space.	Yes, construction is anticipated to commence in 2018 and complete in 2027.	Yorkshire Energy Park is proposed to be constructed adjacent to the Proposed Development. It has the potential to cause significant traffic, cultural heritage, landscape and visual, noise and air quality effects.	Yes	ES
North Killingholme Power Project	8.5 km south-west	Development Consent Order submitted and approved in 2014.	The construction of a new thermal generating station that will operate either as a Combined Cycle Gas Turbine (CCGT) plant or as an Integrated Gasification Combined Cycle (IGCC) plant, with a total electrical output of up to 470MWe.	Yes, construction is anticipated to commence in 2018.	No, the North Killingholme Power Project is located 8.5 km away from the Proposed Development, across the River Humber. Significant cumulative effects are not anticipated.	No	ES
Gas Fired Power Station, Staithes Road	500 m north-west	Full application consented by East Riding of	Erection of a gas-fired energy reserve facility of up to 21 MW capacity comprising of 14 gas reciprocating engine generators, 7	No information on construction	The environmental information available regarding the proposed development did not	Yes	Air Quality Assessment, Noise Impact

Name of Development	Approximate distance from site (m)	Status (at time of assessment)	Description of development	Overlap in temporal scope	Scale and nature of development likely to have a significant effect?	Include in cumulative assessment?	Environmental information available to inform assessment
(16/02800/STPLF)		Yorkshire Council late 2016	transformers and associated ancillary equipment and works.	schedule provided	identify any significant effects		Assessment, Ecological Impact Assessment, FRA, Landscape and Visual Amenity Report, and Ground Conditions Study
Glp Ecotech Ltd, Ferndale Park, Hull (17/01961/PLF)	500 m north	Application approved in 2017	Construction of electricity generating plant for short term operational reserve including 10 generators and associated control room, switch room, transformers, store, security fence, CCTV cameras, access and parking.	No information on construction schedule provided	The environmental information available regarding the proposed development did not identify any significant effects	Yes	Design and Access Statement, FRA, Air Quality Assessment,
Proposed Residential Development, Abbey Lane, Preston (17/01344/OUT)	2 km north-east	Application approved in 2017	Outline – residential development of up to 20 dwellings (all matters reserved), Land East and South of Abbey House, Abbey Lane, Preston.	No information on construction schedule provided	The environmental information available regarding the proposed development did not identify any significant effects.	Yes	Arboricultural Report, Geo-environmental Desk Study, Preliminary Ecological Appraisal, Highway Access Appraisal,
Residential development of up to 24 dwellings, Ness Lane, Preston (15/03802/OUT)	2.5 km north-east	Pending determination	Outline – residential development of up to 24 dwellings (all matters reserved), Land East of 23 Ness Lane, Preston.	No information on construction schedule provided.	If planning permission granted, construction may occur at the same time as the Proposed Development, however, significant effects are not anticipated.	Yes	TA, Planning Statement incorporating Design and Access Statement, Construction Traffic

Name of Development	Approximate distance from site (m)	Status (at time of assessment)	Description of development	Overlap in temporal scope	Scale and nature of development likely to have a significant effect?	Include in cumulative assessment?	Environmental information available to inform assessment
							Management Plan, Preliminary Ecological Appraisal, Great Crested Newt Statement and Mitigation,
Aarhus Karlshamn Warehouse, Staithes Road, Preston (18/02352/PLF)	800 m north	Pending determination	Change of use from B8 use (storage or distribution) to mixed B1 (business), B2 (general industry) and B8 (storage or distribution) use.	No information on construction schedule provided.	Significant effects are not anticipated.	Yes	FRA and Planning Statement
Cranswick Country Foods Extension, Staithes Road, Preston (18/00275/PLF)	2.2 km north-east	Application approved in 2018.	Erection of two storey infill extension, extension to existing switch room and silo with enclosure and retention of storage building following partial demolition of existing building and erection of screening to heat plant.	No information on construction schedule provided.	Significant effects are not anticipated.	Yes	Noise Survey and Design and Access Statement
Thorn Marsh Wet Grassland, Bellcroft Lane, Thorgumbald (18/02470/STPLF)	3.5 km south	Pending determination	Engineering and excavation works to modify the land topography and hydrology for the purposes of creating a wet grassland habitat.	No information on construction schedule provided.	The proposed development aims to have a positive ecological impact. There are no other significant effects anticipated.	Yes	Ecological Appraisal, Planning Statement, FRA, Arboricultural Impact Assessment and Water Vole Survey

- 18.5.3 All of the developments identified in Table 18.2 are considered to be of such a nature and proximity to the Site to have the potential to generate significant cumulative effects. However following an initial assessment, three have been scoped out of detailed assessment for reasons explained in Table 18.2. Those identified as being relevant to the cumulative impact assessment have been subject to assessment for each environmental topic in Section 18.6 below. The location of the other developments outlined in Table 18.2 in relation to the Site is shown in Figure 18.1 (see ES Volume II).

18.6 Cumulative Effects Assessment (Stage 4)

Air Quality

Construction Effects

- 18.6.1 The assessment of construction air quality effects at sensitive receptors has considered the emissions associated with the Proposed Development together with construction of the other proposed developments in Table 18.2 including:

- the emissions from dust generated by construction activities;
- the emissions from construction Non Road Mobile Machinery (NRMM); and
- the emissions from construction road traffic.

Dust and Emissions from NRMM

- 18.6.2 Emissions from NRMM associated with the Proposed Development will be temporary and localised and will be controlled via the application of appropriate emissions standards through best-practice mitigation measures (Building Research Establishment, 2003)), as listed within the framework Construction Environmental Management Plan (CEMP) for the Proposed Development (see Appendix 4A). For that reason, construction phase NRMM emissions are unlikely to be significant and there is not considered to be any potential for cumulative effects with other proposed developments.
- 18.6.3 A planning application for Yorkshire Energy Park is currently under consideration and if planning permission is granted, construction will begin on an adjacent site. Dust and particulate matter emissions would be controlled through the implementation of a CEMP which would include prevention measures, such as screening stockpiles of material, deployment of windbreak netting and dampening exposed soils as appropriate (WSP, 2016).

Construction Traffic Emissions

- 18.6.4 Exhaust emissions from road vehicles could affect the concentrations of principal pollutants of concern, i.e. nitrogen dioxide (NO₂) and particulates (PM₁₀ and PM_{2.5}), at sensitive receptors in the vicinity of the Proposed Development. An assessment has been undertaken considering the air quality impacts assuming the peak year of construction of the Proposed Development in 2021, with assumptions on vehicle emission rate and background pollutant concentration improvements between now and then. This assessment was inherently cumulative, in that it included traffic flows associated with major committed developments (including Hull LDO) and the level of anticipated general traffic growth, in the future baseline contribution.
- 18.6.5 With the exception of annual mean NO₂ at two receptors, annual mean concentrations of all the pollutants considered were found to be below the relevant national air quality objectives. The impact of construction phase traffic emissions on annual mean concentrations of PM₁₀ and PM_{2.5} across the study area is imperceptible and the effect is therefore negligible (not significant). The impact of construction phase traffic emissions on annual mean NO₂ is perceptible at a number of locations, with the greatest impact (change) predicted to occur at receptors off Hull Road (A1033) and Hedon Road (A63), near to its junction with Tower House Lane. At Hull Road, a slight increase is expected, constituting a minor adverse (not significant) effect, whilst at Hedon Road, the increase constitutes a moderate adverse (potentially significant effect).

18.6.6 However, due to the isolated area where moderate adverse effects are predicted and the temporary nature of these effects, overall the impact of the construction phase road traffic emissions is not considered to constitute a significant effect.

18.6.7 The construction and operational traffic assessment for Yorkshire Energy Park concluded that effects from NO₂ and particulate emissions are negligible at receptors and are not considered further (WSP, 2016). There were no significant air quality effects identified for this and the other developments identified in Table 18.2 and therefore significant cumulative effects are not anticipated.

Operational Effects

18.6.8 A qualitative assessment has been made of the operational Proposed Development air quality effects at sensitive receptors together with other proposed developments through consideration of the nature, location and scale of these other developments, as described below:

- The proposed Yorkshire Energy Park site is located adjacent to the Site. Potential effects on air quality associated with the construction and operation of Yorkshire Energy Park are considered negligible (WSP, 2016). In relation to NO₂, the proposed scheme is likely to result in, at worst, effects of minor adverse significance to residential receptors and moderate adverse significance to commercial and industrial receptors (WSP, 2016). However, with mitigation in place, the residual effects are considered to be of negligible significance.
- There are two proposed developments at Salt End Chemicals Park, located 180 m from the Proposed Development. However, given the existing nature of the Salt End Chemicals Park, air quality impacts are anticipated to be negligible.
- The other proposed developments listed in Table 18.2 are considered unlikely to result in emissions of pollutants within the impact zone of the operational Proposed Development, due to their distance and nature.

18.6.1 A qualitative assessment has been made of the operational Proposed Development air quality effects at sensitive receptors (which was inherently conservative and included traffic flows associated with other major committed developments including Hull LDO) through consideration of the nature, location and scale of these other developments, as described below:

- There are two proposed developments at Salt End Chemicals Park, located 180 m from the Proposed Development. However, given the existing nature of the Salt End Chemicals Park, air quality impacts are anticipated to be negligible.
- The other proposed developments listed in Table 18.2 are considered unlikely to result in emissions of pollutants within the impact zone of the operational Proposed Development, due to their distance and nature.
- The proposed Yorkshire Energy Park site, which is proposed to be located adjacent to the Site, has also been considered in the assessment. The air quality assessment published to accompany the planning application for that site stated that potential effects on air quality associated with the construction and operation of Yorkshire Energy Park are considered negligible (WSP, 2016). It also stated that in relation to NO₂, the proposed scheme is likely to result in, at worst, effects of minor adverse significance to residential receptors and moderate adverse significance to commercial and industrial receptors (WSP, 2016). However, with mitigation in place, the residual effects are considered to be of negligible significance. The air quality assessment for the Proposed Development confirmed that the inclusion of Yorkshire Energy Park traffic flows would not alter the conclusions of the assessment.

18.6.2 For this reason, and as none of the other developments are predicted to have more than negligible air quality effects, no significant cumulative operational air quality effects are predicted.

Noise and Vibration

Construction Effects

- 18.6.3 The majority of other developments in Table 18.2 are unlikely to contribute towards cumulative noise effects due to their distance from the Site.
- 18.6.4 Chapter 8: Noise and Vibration has identified that predicted construction noise and vibration effects at all receptors during construction of the Proposed Development in isolation are predicted to be negligible or minor adverse (not significant).
- 18.6.5 The other developments that have been scoped in to the cumulative noise and vibration assessment due to their close proximity to the Site are:
- Saltend Chemicals Park (installation of infrastructure);
 - Saltend Hybrid Natural Gas Production and Energy Storage;
 - Yorkshire Energy Park;
 - Gas Fired Power Station, Staithes Road; and
 - GLP Ecotech Ltd, Ferndale Park, Electricity Generating Plant.
- 18.6.6 With respect to Saltend Chemicals Park and Saltend Hybrid Natural Gas Production and Energy Storage, construction techniques will be used to minimise noise and ensure there are no significant effects.
- 18.6.7 With respect to the proposed Gas Fired Power Station, Staithes Road, and GLP Ecotech Ltd, Ferndale Park, Electricity Generating Plant, the environmental information available has outlined that no significant effects are anticipated.
- 18.6.8 With respect to Yorkshire Energy Park, demolition and enabling works will be required to be undertaken prior to the construction of the proposed development; these have the potential to influence noise and vibration at the Site. According to the ES (WSP, 2016) for the large majority of the construction phase, effects are likely to be negligible to minor adverse. However, where construction activities are undertaken within close proximity to the site boundaries and existing noise sensitive receptors, such as Songbirds Nursery, effects are anticipated to be major adverse, even with the implementation of mitigation measures. For the Kingstown Hotel, for worst case construction effects are likely to be of moderate adverse significance, even with the implementation of mitigation measures.
- 18.6.9 Through the preparation of construction noise control schemes (including agreed noise limits) once contractors are appointed, cumulative construction noise effects at surrounding NSRs are mostly considered to be negligible (not significant). However, it is predicted that there is potential for a significant adverse cumulative effect on the Kingstown Hotel if the construction of the northernmost parts of the Proposed Development and Yorkshire Energy Park occur at the same time. The construction of the Proposed Development in isolation is predicted to have a short term minor adverse (not significant) effect on the Kingstown Hotel.
- 18.6.10 During the construction phase there will also be additional vehicle movements from staff and delivery HGVs accessing the Site from the surrounding road network. Changes to road traffic on the roads surrounding the Site during construction of the Proposed Development are considered to be negligible with respect to environmental noise, with a maximum increase of 1 dB, with the exception of Paull Road which is predicted to be 7.5 dB. However, the nearest property is 600 m away and there are no sensitive properties on Paull Road itself. The assessment of construction traffic noise associated with Yorkshire Energy Park (WSP, 2016) has found that, with the exception of Hull Road (A1033), noise level changes of less than 1 dB are predicted to arise due to construction traffic. There were no significant noise effects identified for any of the other developments identified in Table 18.2, therefore significant cumulative construction traffic noise effects are not anticipated.

Operational Effects

- 18.6.11 Given that the operation of the Proposed Development is expected to be 24 hours, provided that noise levels are acceptable during night-time hours, they will automatically be acceptable during the daytime period when existing ambient noise levels are higher.
- 18.6.12 Noise modelling software has been used to predict operational road traffic noise effects. Committed developments are included in the traffic data generated by the TA so cumulative impacts with committed developments are inherently considered by the assessment presented in Chapter 8: Noise and Vibration. The TA sensitivity analysis of cumulative traffic impacts with Yorkshire Energy Park has been used to assess cumulative traffic noise impacts with the Proposed Development and effects at all identified receptors are predicted to be negligible or minor adverse (not significant).
- 18.6.13 None of the other proposed developments are considered to have potential for significant cumulative operational noise effects with the Proposed Development.

Traffic and Transport

Construction Effects

- 18.6.14 Chapter 6: Traffic and Transport considers the potential effects of the Proposed Development on access and transport. The future baseline against which the construction traffic impacts are assessed includes committed development, so the assessment inherently takes account of other committed developments (but not those for which planning consent has not yet been granted).
- 18.6.15 No significant cumulative construction effects have been identified from the other proposed developments in Table 18.2 that are not yet 'committed', therefore no significant cumulative construction traffic effects are anticipated. The effect of construction traffic associated with the Yorkshire Energy Park development is unlikely to be significant based on all road links experiencing less than a 10% increase in either traffic flow or HGV movement (WSP, 2016).

Operational Effects

- 18.6.16 The future baseline against which the operational traffic impacts are assessed includes committed development, so the assessment presented in Chapter 6: Traffic and Transport inherently takes account of other committed developments such as the Hull LDO (but not those for which planning consent has not yet been granted).
- 18.6.17 The only other proposed development that is not included in the future baseline for the TA and is considered to have potential for significant cumulative traffic effects on the local road network is Yorkshire Energy Park. The TA in Appendix 6A includes a sensitivity test to consider the potential cumulative impacts of the Proposed Development with this other development, and concludes that, with the junction improvements proposed as mitigation for the Yorkshire Energy Park development, there would be no significant junction capacity effects with both developments in operation. A note on trigger points for these highway mitigation measures to be implemented, relative to the proportion of development completed, is included in the TA (Appendix 6A).
- 18.6.18 The Yorkshire Energy Park development includes the creation of new pedestrian and cycle routes which will link into the existing network and provide opportunities for walking and cycling. These links will provide access to the existing residential areas to the east in Preston South/ Hedon, employment areas to the west in Salt End, Hull Road (A1033) and the South Holderness Rail Trail.
- 18.6.19 The cumulative impacts of provision of opportunities for walking and cycling associated with both the Proposed Development and Yorkshire Energy Park development are likely to have a beneficial cumulative effect for pedestrians and cyclists. Significant cumulative effects are not anticipated for any of the other developments identified in Table 18.2. Of the other developments in close proximity to the Proposed Development, Saltend Chemicals Park, Saltend Hybrid Natural Gas Production and Energy Storage, the Gas Fired Power Station on Staithes Road and the GLP Ecotech Ltd development, no significant additional operational traffic is expected to be generated. Ecology and Nature Conservation

Ecology and Nature Conservation

Construction Effects

- 18.6.20 Chapter 9: Ecology and Nature Conservation concludes that the potential effects of the Proposed Development on ecological receptors, during construction, will be limited.
- 18.6.21 The existing c.5 m high flood embankment will provide visual screening of construction activities within the Site from birds using the Salt End mudflats and therefore effects are not predicted to be significant. Potential effects on great crested newts, otter, barn owls and the area of semi-improved grassland and scrub mosaic habitat in the north-western part of the Site are all considered to be not significant due to mitigation embedded into the design.
- 18.6.22 New habitat has already been created for waterbirds at Newton Garth and adjacent to Salt End mudflats to avoid impacts associated with the development of the Site.
- 18.6.23 It is therefore considered that during construction, there is no potential for significant cumulative effects of the Proposed Development and any other developments in Table 18.2.

Operational Effects

- 18.6.24 Potential effects of the operation of the Proposed Development on ecological receptors are considered to be not significant.
- 18.6.25 The existing c. 5 m high flood embankment will minimise the risk of any light spill onto the adjacent mudflats from within the Proposed Development. Additionally, the presence of large-scale industrial complexes around the Salt End mudflats and oil jetties mean there is a degree of baseline nocturnal lighting already and effects will thus not be significant.
- 18.6.26 The modelling undertaken in Chapter 8: Air Quality and Greenhouse Gases predicts that the Proposed Development will contribute less than 1% of the objective value for nitrogen dioxides and no significant nitrogen deposition effects on habitats in the designated Humber Estuary are predicted.
- 18.6.27 It is therefore considered that during operation, there is no potential for significant cumulative effects of the Proposed Developments and any other developments in Table 18.2.

Landscape and Visual Amenity

- 18.6.28 The cumulative assessment considers the effects of the Proposed Development and the Yorkshire Energy Park application on the landscape and visual receptors outlined in Chapter 10: Landscape and Visual Amenity. None of the other proposed developments in Table 18.2 are considered to have the potential for significant cumulative landscape and visual effects with the Proposed Development.

The cumulative impact of the Proposed Development and the Yorkshire Energy Park would be significant adverse landscape effects at a local level, to Local Landscape Character Areas 1, 2 and 9 throughout the construction, opening and operation phases. Whilst both developments are in part adjacent to the A1033, these significant adverse effects are primarily due to the Yorkshire Energy Park development which would be located within the Local Plan 'Key Open Area'. As such it is the Yorkshire Energy Park scheme which would result in the eastwards expansion of Hull and increased perception of the coalescence of these settlements. The Yorkshire Energy Park scheme is also located within across a 'key view', whereas the Proposed Development is set back from the A1033 and contained by structural landscaping.

- 18.6.29 The cumulative visual effects are reflective of the visual assessment of the Proposed Development only, as from the majority of visual receptors the Proposed Development would be the main focus of the view, due to its height and scale in comparison to the Yorkshire Energy Park development. However, for the visual receptors to the north of the Site, including recreational users at Staithe Road and residents at Bamford Road, the cumulative impact of the Proposed Development and the Yorkshire Energy Park would result in significant adverse visual effects during construction and the opening phases due to its location within identified 'key views' and the Local Plan 'Key Open Area'.

Construction Effects

Landscape

- 18.6.30 At a local level, the Yorkshire Energy Park development would be located in LCA Area 1: West of North West Hedon: Hull Road to the Dismantled Railway Line. The Proposed Development will be located in LCA Area 9: South to West Hedon, Fairbridge Lane to Hull Road.
- 18.6.31 Both Area 1 and Area 9 include 'Key Open Areas', for preventing the coalescence of Hull and Hedon. Area 1 also includes a 'key view' from the A1033 roundabout, to the north of the Saltend Chemicals Park, towards Hedon.
- 18.6.32 For Area 1, there would be a high magnitude of cumulative impact during the construction phase, as a result of the cumulative impact from the direct change to the surface landform and construction activity of the Yorkshire Energy Park, with the inter-visibility of the construction activity of the Proposed Development. The high magnitude of cumulative impact represents an increase from the medium magnitude of impact for the assessment of the Proposed Development only. The high magnitude of impact, in relation to the high sensitivity of Area 1 would result in a major adverse (significant) effect during the construction phase, although this will be short term. The major adverse effect reflects the significant effect identified for the assessment of the Proposed Development only.
- 18.6.33 For Area 2: West of Station Road: Dismantled Railway Line to Staithes Road, to the north of the Yorkshire Energy Park area, the cumulative impact of the two developments during construction would be medium magnitude. This is as a result of the close range inter-visibility with the Yorkshire Energy Park construction activity, and the change to the perceptual and aesthetic characteristics of Area 2. The cumulative medium magnitude of impact is an increase from the low magnitude of impact assessed for the Proposed Development only. In relation to the high sensitivity of Area 2, the cumulative medium magnitude of impact would result in a cumulative major adverse (significant) effect during the construction phase, in comparison to the moderate adverse (significant) effect for the Proposed Development only.
- 18.6.34 For Area 9, the direct change to the landscape features within the Site along with the perception of the Yorkshire Energy Park construction, the change in land use at the Site and the Yorkshire Energy Park area at the opening phase, would result in a cumulative high magnitude of impact. This high magnitude of impact reflects the assessment of the Proposed Development only during the construction and opening phases. The cumulative high magnitude of impact in relation to the high sensitivity of Area 9 would result in major adverse (significant) effects during the construction and opening phases. The major adverse effect reflects the assessment of the Proposed Development only.

Visual

- 18.6.35 The visual assessment of the Yorkshire Energy Park and Proposed Development is based upon whether the two developments would be visible at the same time from the 12 viewpoints identified for the assessment of the Proposed Development.
- 18.6.36 From many of the viewpoints, the Proposed Development would be the main focus of the view during the construction, opening and operation phases, due to the taller buildings and more extensive area of development across the Site than compared to the Yorkshire Energy Park area. As a result, the cumulative impacts and significance of effects to many of the visual receptors reflect those of the assessment of the Proposed Development only.
- 18.6.37 The exception is for users of Public Right of Way (PRoW) and residents represented by Viewpoints 9: View from PRoW at Staithes Road in the west of Preston and Viewpoint 10: View from Bamford Avenue in the east of Marfleet. From these locations, the Yorkshire Energy Park construction activity would be visible at close range, which in combination with views of the cranes and construction of the upper parts of the Proposed Development, would result in a cumulative medium magnitude of impact. The cumulative medium magnitude of impact represents an increase from the low magnitude of impact for the Proposed Development only. The cumulative medium magnitude of impact, in relation to the medium sensitivity of visual receptors would result in a moderate adverse effect (significant) during the construction phase.

Operational Effects

Landscape

- 18.6.38 During the opening phase, the YEP development would introduce new buildings within Area 1. Together with the new buildings of the Proposed Development, there would be a physical and perceived increase in the amount of development adjacent to the A1033 and a reduction in the sense of separation between Hull and Hedon, particularly with the Yorkshire Energy Park development within an identified 'key view' and 'Key Open Area'. The combined size and scale of the impact of the two developments would be medium, such that the cumulative magnitude of impact would be medium. This cumulative medium magnitude of impact represents an increase from the low magnitude of impact for the Proposed Development only. The cumulative medium magnitude of impact, in relation to the high sensitivity of Area 1 would result in a major adverse (significant) effect at opening. The cumulative major adverse effect represents an increase from the minor adverse (not significant) effect identified for the Proposed Development only.
- 18.6.39 In the future operation scenario, the proposed planting within the two developments would have established, to aid in integration of the new Yorkshire Energy Park buildings within Area 1 and those of the Proposed Development. The Yorkshire Energy Park development would however retain the eastwards expansion of Hull, and would reduce the physical and perceived separation between Hull and Hedon, with development remaining within a 'Key Open Area' and 'key view', such that the cumulative magnitude of impact would remain medium and the cumulative effect major (significant) adverse. This represents an increase from the negligible adverse (not significant) effect assessed for the Proposed Development only at operation.
- 18.6.40 For Area 2: West of Station Road: Dismantled Railway Line to Staithes Road, to the north of the Yorkshire Energy Park area, the cumulative impact of the two developments during construction would be medium magnitude. This is as a result of the close range inter-visibility with the Yorkshire Energy Park construction activity, and the change to the perceptual and aesthetic characteristics of Area 2. The cumulative medium magnitude of impact is an increase from the low magnitude of impact assessed for the Proposed Development only. In relation to the high sensitivity of Area 2, the cumulative medium magnitude of impact would result in a cumulative major adverse (significant) effect during the construction phase, in comparison to the moderate adverse (significant) effect for the Proposed Development only.
- 18.6.41 At opening and in operation, the Yorkshire Energy Park development would increase the perception of development adjacent to Area 2 and the eastwards extension of Hull. In contrast, the perception of the Proposed Development would be reduced because of the Yorkshire Energy Park development. The cumulative impact of the two developments would therefore be a small change to the perceptual and aesthetic characteristics of Area 2 and the cumulative magnitude of impact would be low. This cumulative low magnitude of impact is an increase from the very low magnitude of impact assessed for the Proposed Development only. In relation to the high sensitivity of Area 2, the cumulative low magnitude of impact would result in a moderate adverse (significant) effect at opening, compared to the minor adverse (not significant) effect for the Proposed Development only.
- 18.6.42 In future operation, the establishment of the new planting within the Site and at the Yorkshire Energy Park would aid in integrating the new buildings. However, with the change of land use remaining, the cumulative magnitude of impact would be medium. This reflects the medium magnitude for the assessment of the Proposed Development only. The cumulative medium magnitude of impact in relation to the high sensitivity of Area 9 would result in a cumulative moderate adverse (significant) effect during the operation phase. The cumulative moderate adverse effect reflects the assessment of the Proposed Development only.

Visual

- 18.6.43 At the opening phase, the buildings within the Yorkshire Energy Park area would be visible and represent a change from the agricultural fields. In combination with views of the upper parts of buildings within the Site, the magnitude of impact is assessed as ranging between medium and low. This represents an increase from the low and very low magnitude of impact for the assessment of the Proposed Development only. The cumulative medium and low magnitude of impact, in relation to the medium sensitivity of the visual receptors would result in moderate adverse (significant) effects for PRow users at Staithes Road and minor adverse (not significant) effects for residents at Bamford Road.

The increase in the magnitude of the impact and significance of effect to these receptors is a result of the Yorkshire Energy Park development.

- 18.6.44 At the future operation phase, the establishment of the planting, in combination with the existing vegetation being in leaf, would reduce the cumulative impact of the Yorkshire Energy Park and Proposed Development for these receptors, such that the cumulative effects would not be significant.

Summary of Cumulative Landscape and Visual Effects

- 18.6.45 In summary, the cumulative impact of the Proposed Development and the Yorkshire Energy Park would be significant adverse landscape effects at a local level, to Areas 1, 2 and 9 throughout the construction, opening and operation phases. Whilst both developments are in part adjacent to the A1033, these effects are primarily due to the Yorkshire Energy Park development, and the perceived eastwards expansion of Hull, across a 'Key Open Area' and within a 'key view', whereas the Proposed Development is set back from the A1033 by structural landscaping and the 'Key Open Area' is retained adjacent to Hull. The cumulative effect would be a reduction in the physical separation between Hull and Hedon and increased perception of coalescence.
- 18.6.46 In summary, the cumulative visual effects are reflective of the visual assessment of the Proposed Development only, as for the majority of visual receptors, the Proposed Development would be the main focus of the view, due to its height and scale in comparison to the Yorkshire Energy Park development. However, for those visual receptors to the north of the Site, including recreational users at Staithes Road and residents at Bamford Road, the cumulative impact of the Proposed Development and the Yorkshire Energy Park would result in significant adverse visual effects during construction and (for PRow users at Staithes Road only) the opening phase.

Socio-Economics

Construction Effects

- 18.6.47 Chapter 11: Socio-Economics addresses the potential effects of the construction and operation of the Proposed Development on employment, local businesses and the local population.
- 18.6.48 Construction of the Proposed Development is anticipated to take up to 15 years and will create temporary jobs. It is assumed that the majority of jobs will be taken by people living in the Hull travel to work area (TTWA).
- 18.6.49 In addition to the direct construction employment generated by the Proposed Development itself, there will be an increase in local employment arising from indirect and induced effects of the construction activity.
- 18.6.50 Paull Primary School is located approximately 40 m south-west of the Site. During the construction period, the school could be disrupted by construction activities, however, due to the phased nature of construction, this impact is likely to be negligible.
- 18.6.51 The construction period has the potential to increase local demand for accommodation during the construction period, however, this is anticipated to be negligible.
- 18.6.52 It is possible that the construction of the Proposed Development will overlap with the construction of several other developments listed in Table 18.2. This would be likely to create a significant beneficial impact on the Hull TTWA through the creation of jobs and increase in demand for accommodation.

Operational Effects

- 18.6.53 The Proposed Development will generate long-term jobs once operational. The direct, indirect and induced employment created by the operational phase of the Proposed Development is likely to have a major beneficial long-term (significant) effect on the Hull TTWA's economy.
- 18.6.54 New jobs will be created in the Direct Impact Area offering employment opportunities for local residents. This effect is assessed as a major beneficial (significant) effect.

- 18.6.55 The operation of many of the other developments identified in Table 18.2 are likely to direct and indirect employment opportunities in the Hull TTWA and therefore it is considered that there will be a major beneficial (significant) cumulative effect.

Land Use and Agriculture

- 18.6.56 The Site is currently used by a tenant farmer and has remained in agricultural use for many years.
- 18.6.57 It is anticipated that the Proposed Development will have a temporary and short term major adverse (significant) effects on Paull Footpath No. 5 due to the temporary stopping up of the footpath during construction of the spine road in the northern part of the Site.
- 18.6.58 The Proposed Development will also have a major adverse (significant) effect due to the permanent loss of best and most versatile (BMV) agricultural land, although this has been taken into consideration in the allocation of the land for employment use by East Riding of Yorkshire Council.
- 18.6.59 It is not anticipated that any of the developments identified in Table 18.2 will have an impact upon Paull Footpath No.5 and none of the other development result in significant loss of BMV agricultural land. Therefore no significant cumulative effects on land use and agriculture are anticipated.

Water Resources, Flood Risk and Drainage

Construction Effects

- 18.6.60 Potential cumulative impacts to water resources during construction activities may be associated with the generation of sediments and the release into the sewer drainage network, spillage and leakage of oils and fuels, leakage of wet concrete and cement, disturbance of contaminated land, suspended sediments, and disturbance to groundwater and foul drainage.
- 18.6.61 There is a lack of direct hydrological connectivity between the developments listed in Table 18.2 and the Site.
- 18.6.62 The standard impact avoidance measures proposed for all developments through construction best practice will reduce the risk of impacts occurring during the construction and operational phases of the Proposed Development and other developments. These include implementation of Environment Agency/ Defra guidance, a CEMP and construction staff awareness and training, implementation of pollution plans and the appropriate discharge/disposal of site runoff. Therefore significant cumulative effects are not anticipated.

Geology, Hydrogeology and Contaminated Land

- 18.6.63 Chapter 14: Geology, Hydrogeology and Contaminated Land addresses the potential effects of the Proposed Development on geotechnical and geo-environmental ground conditions and groundwater.
- 18.6.64 The construction and operation activities proposed at the Site would have the potential to generate some limited land contamination related adverse effects on identified receptors if appropriate mitigation measures are not implemented. However, assuming that appropriate impact avoidance measures are employed and any further mitigation measures identified as a result of pre-construction ground investigations are implemented, then the significance of geological, hydrogeological and contamination effects associated with the Proposed Development during the construction and operation phases are likely to be negligible, and therefore not significant.
- 18.6.65 None of the other developments identified in Table 18.2 have the potential to affect ground conditions at the Site, and none are anticipated to adversely affect the groundwater. Therefore, no significant cumulative effects on groundwater are predicted.

Cultural Heritage

- 18.6.66 Chapter 15: Cultural Heritage addresses the potential effects of the Proposed Development on cultural heritage assets.

Construction Effects

- 18.6.67 For a cumulative impact to arise as a result of physical impacts during construction, another development would have to share a boundary with the Site in order to potentially impact the same buried archaeological resource during construction. There are no other developments that share a boundary with the Site.
- 18.6.68 The Proposed Development will involve the development of a large piece of land between the settlements of Hedon and Paull. As such, there is the potential for impacts on the historic settlements, including the conservation areas.
- 18.6.69 The proposed Yorkshire Energy Park development avoids any physical impact to Hedon Town Scheduled Monument at the eastern end of the Site, Therefore construction phase effects are considered to be non-existent. Construction activities associated with the Yorkshire Energy Park development are unlikely to have a significant effect on the setting of the scheduled monument earthworks at the eastern end of the site, or other designated heritage assets within the surrounding area.

Operational Effects

- 18.6.70 The operation of the Proposed Development will cause a moderate adverse (significant) effect on Hedon Town Scheduled Monument arising from a slight change to its setting. There will be minor adverse (not significant) effects on the conservation areas at Hedon and Hedon Haven as a result of the development between the settlement and Hull. The effect of this would be limited by the inclusion of a buffer between the two to maintain separation; however, it remains an erosion of their setting.
- 18.6.71 Hedon Town Scheduled Monument is located at the eastern end of the Yorkshire Energy Park development. The contribution of setting to the significance of the Scheduled Monument is considered to be moderately adverse (significant). Following mitigation, the operation of Yorkshire Energy Park will have a negligible impact upon the setting of the Scheduled Monument (WSP, 2016). Therefore, there is likely to be a cumulative effect (not significant) on the setting of the Scheduled Monument with the Proposed Development.
- 18.6.72 The other developments identified in Table 18.2 are not anticipated to cause cumulative effects on cultural heritage.

Waste Management

- 18.6.73 As part of their regional planning responsibilities, the East Riding of Yorkshire Council have a responsibility to plan for waste management and to ensure that sufficient sites are available to provide the necessary capacity during the planning period. Further capacity may also be provided on a regional basis by waste transfers within the larger Yorkshire and Humberside region.
- 18.6.74 With this larger regional context, the effects of waste generated from the Proposed Development on the regional capacity for waste management are at such a low level that significant cumulative effects with other developments are not anticipated.
- 18.6.75 A Site Waste Management Plan (SWMP) will be prepared and implemented for the Proposed Development in accordance with industry best practice.

Human Health

- 18.6.76 The key health effects that have been identified in relation to the Proposed Development are considered in the various technical chapters of the ES and signposted in Chapter 17: Human Health. No additional

cumulative health effects are identified to those described in relation to traffic and transport, air quality, noise, socio-economics, land use, water, contaminated land and waste management above.

18.7 Combined Effects

- 18.7.1 Combined effects may arise where several different effects resulting from the construction works or operation of the Proposed Development, which might themselves be non-significant, together have the potential to affect a receptor significantly. Combined effects from the Proposed Development can only occur where there are receptors that are sensitive to change in more than one of the above environmental aspects.
- 18.7.2 Combined effects from the Proposed Development can only occur where there are receptors that are sensitive to changes to more than one environmental aspect, such as noise and air quality.
- 18.7.3 Chapter 9: Ecology and Nature Conservation considers all types of effects on ecological receptors and no significant effects are identified.
- 18.7.4 Effects on human receptors are considered in Chapters 6: Traffic and Transport, 7: Air Quality and Greenhouse Gases, 8: Noise and Vibration, 10: Landscape and Visual Amenity, 11: Socio-Economics, 12: Land Use and Agriculture, 13: Water Resources, Food Risk and Drainage, 14: Geology, Hydrogeology and Contaminated Land, and 17: Human Health. Following a review of the conclusions of these assessments, no significant combined effects have been identified.
- 18.7.5 Effects on air, land and water receptors are considered in Chapters 7: Air Quality and Greenhouse Gases, 12: Land Use and Agriculture, 13: Water Resources, Flood Risk and Drainage, and 14: Geology, Hydrogeology and Contaminated Land and no additional combined effects have been identified.
- 18.7.6 Chapters 10: Landscape and Visual Amenity and 15: Cultural Heritage consider all types of effects on the landscape and heritage assets and no additional combined effects on these receptors are identified.

18.8 Limitations

- 18.8.1 Any limitations that were encountered during the individual assessments are detailed within Chapters 6 to 17.
- 18.8.2 The cumulative assessment is based on the currently available information on other potential or committed developments in the vicinity of the Site.

18.9 Conclusions

- 18.9.1 The assessment of combined effects has not identified any significant combined effects.
- 18.9.2 The assessment of cumulative impacts has considered a number of other developments within the vicinity of the Site, the proposed Yorkshire Energy Park in particular, and the potential for cumulative impacts to arise from one or several of the other developments together with the Proposed Development.
- 18.9.3 Through consideration of the information available for each other developments (including the Environmental Statements and detailed modelling information where available) it has been concluded that there is limited potential for significant cumulative effects.
- 18.9.4 Cumulative impacts with existing developments have been accounted for through establishing the current baseline for each technical assessment (presented in Chapters 6 to 17).

18.10 References

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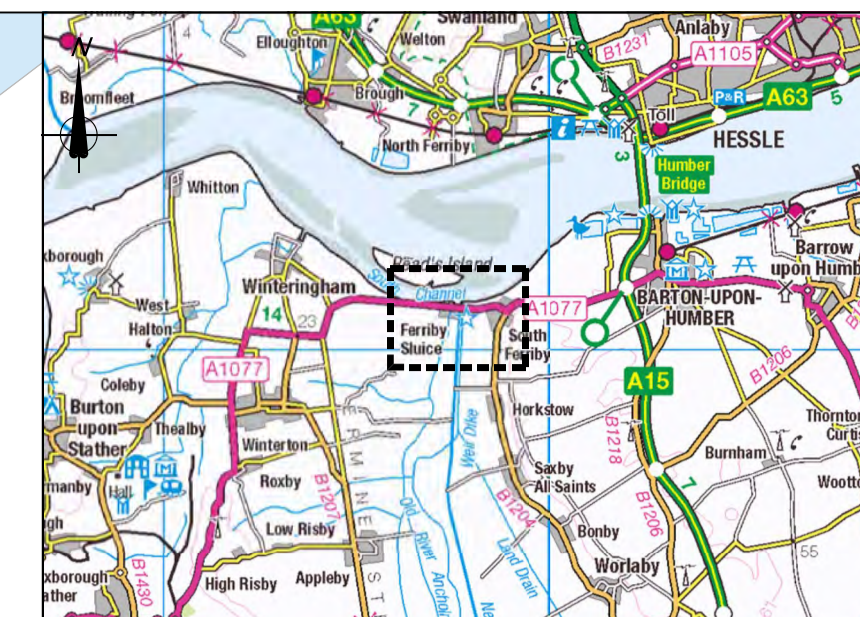
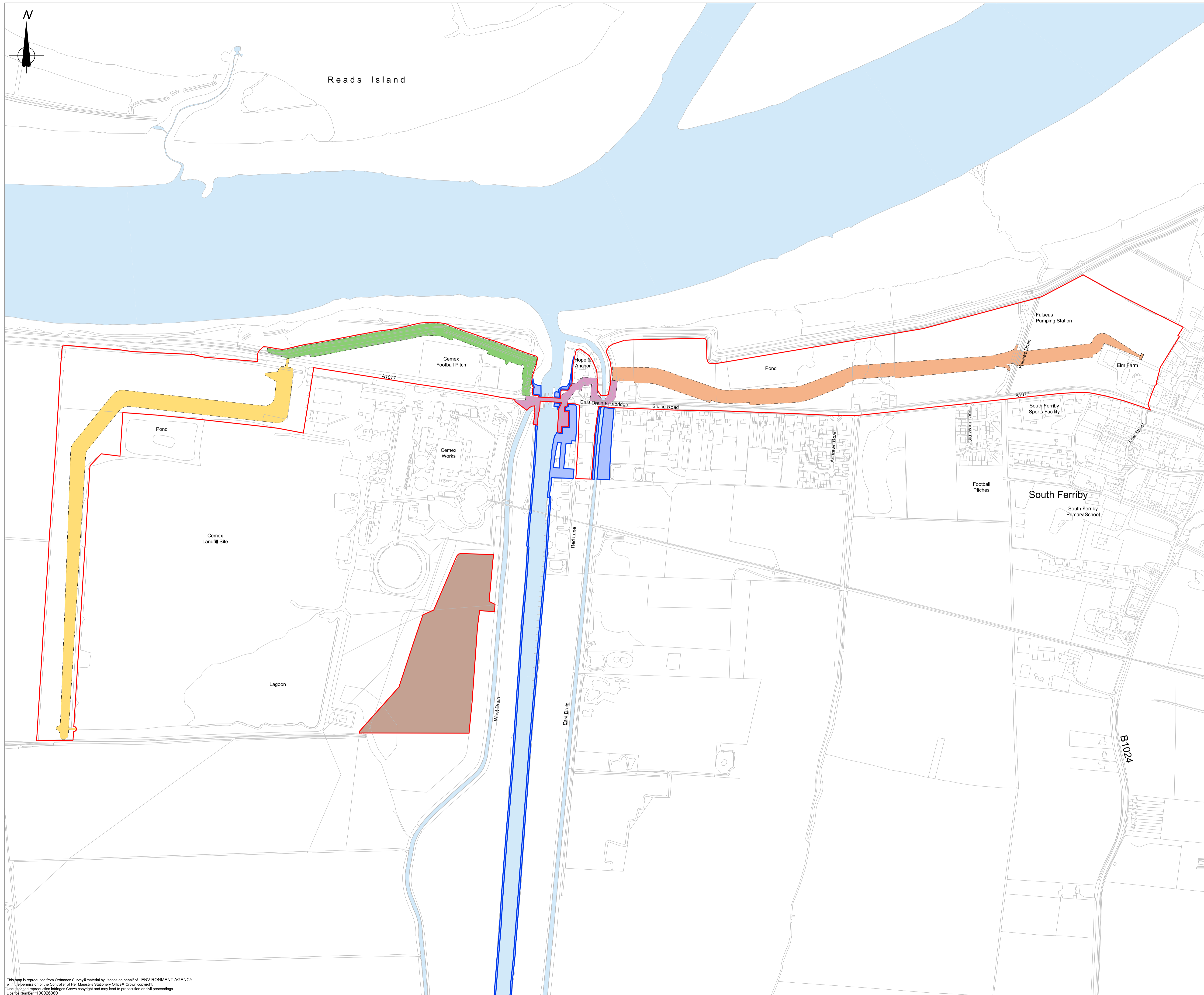
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**Winteringham Ings to South Ferriby Flood
Relief Scheme**



- Key:**
- PLANNING APPLICATION BOUNDARY
 - OTHER LAND UNDER CONTROL OF THE APPLICANT
 - FRONTAGE 1
 - FRONTAGE 2
 - FRONTAGE 3
 - FRONTAGE 4
 - CEMEX AREA FOR PLANTING

**DRAWING FOR
PLANNING APPLICATION
ONLY**



Rev	By	Chkd	Apprvd	Date	Description
C01	AR	MW	JF	19/11/18	FOR PLANNING
P01	AR	MW	JF	23/10/18	FOR PLANNING



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Project
WINTERTINGHAM INGS TO SOUTH FERRIBY
FLOOD ALLEVIATION SCHEME

Drawing
**SITE LOCATION
SITE LOCATION**

Drawn by: A.ROBERTS	Date: 20/08/18
Checked by: M.WHITE	Date: 14/11/18
Approved by: J.FERGUSON	Date: 16/11/18

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12. Cumulative Effects

12.1 Introduction

The requirement for cumulative (or in-combination) assessment comes from the EIA Directive (Directive 85/337/EEC) and its amendments. Cumulative impacts result from the combined impacts of multiple developments or the combined effect of individual impacts, e.g. where different project elements in different locations have a cumulative impact on a particular receptor, or where different impacts such as noise, air pollution and traffic disruption all affect the same receptor. Individual impacts may not be significant on their own but when combined with other impacts, these could become significant.

Cumulative effects can also be considered as effects resulting from incremental change caused by other past, present or reasonably foreseeable activities, developments or plans together with the Scheme, i.e. multiple projects acting in combination. 'Reasonably foreseeable' is interpreted to include other proposals that already have consent or are awaiting determination in the planning process with design information in the public domain.

12.2 Methodology

The 'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions' (European Commission 1999) were used in the assessment of cumulative impacts. The assessment considers beneficial cumulative effects as well as potential adverse effects. This included a desk-based review of relevant plans, strategies and planning applications within 2 km of the proposed development. North Lincolnshire Council was contacted regarding its knowledge of any other planning submissions which may have the potential for cumulative effects with the Scheme.

12.2.1 In-combination effects

The cumulative impacts identified in this section are those multiple actions or combined impacts from various elements of the Scheme acting on a single environmental receptor or resource. Any impacts identified in earlier sections to be 'negligible', 'neutral' or 'neutral/slight' are not considered in this section. The primary focus was upon significant residual effects, however, non-significant effects (slight or above) were also considered to allow for consideration of a number of minor impacts affecting one receptor to make a cumulative significant impact. A two-step process was carried out, as explained below.

Step 1: The methodology was as follows:

- A review (see Table 13.1, 2nd column) was carried out of the residual effects from the individual topic assessments, as set out in chapters 5 to 12;
- Consideration was then made as to the potential for interaction with other topic areas;
- Identification of relevant sensitive receptors was made.
- Where the same sensitive receptor was identified in relation to two or more individual topics, this receptor was considered further at Step 2.

Table 13.1: Identification of in-combination effects

Topic	Residual effects	Potential for interaction with other topics in this ES	Sensitive receptors affected
Biodiversity During construction and operation	No significant residual effects identified.	None	
Landscape During construction	Views from long-distance PRoW (including Long Distance Trail SFER 32 and Nev Cole Way Long Distance Route) – moderate adverse impact	None	
	Views from PRoW (FP/SFER/30, FP/SFER/24) – slight adverse impact	None	
	Views from residential receptors where the embankment is close to Sluice Road – moderate adverse impact (slight adverse for houses set further away).	Yes, with Population and human health	Residential receptors
Landscape During operation	Setting of Listed Buildings in the landscape (including South Ferriby Hall, Woodside Farmhouse, Glentworth House, Church of Saint Nicholas). Slight adverse impacts.	None (same impact as identified in Cultural Heritage)	
	Views from residential receptors where the embankment is close to Sluice Road – moderate adverse impact (slight adverse for houses set further away).	Yes, with Population and human health	Residential receptors
	Views from commercial and industrial premises (CEMEX, The Marina) – slight adverse impact.	None	
	Local Character areas of high / medium value (Settled Wooded Slopes, Ribbon settlement along Sluice Road (A1077), Estuarine Flats and Farmland, Marina) – Moderate/slight adverse impact.	None	
	Local Authority Character Areas - Flat Drained Farmland. Moderate/slight adverse impact.	None	
Cultural heritage	Asset 1 - Ferriby Sluice SM – new floodwall would impact on the fabric and setting of the SM. Slight adverse impacts.	None	

Topic	Residual effects	Potential for interaction with other topics in this ES	Sensitive receptors affected
Short term (during construction)	Asset 46 – South Ferriby Hall Grade II Listed Building – impact on its setting during construction. Slight adverse impact.	None	
	Asset 48 – Church of St Nicholas Grade II* Listed Building – impact on its setting during construction. Slight adverse impact.	None	
	Asset 67 – Nos. 9 & 10 Sluice Road – impact on its setting during construction. Slight adverse impact.	None	
Cultural heritage Long term (during operation)	Asset 1 – Ferriby Sluice SM – enhanced flood protection – slight/moderate beneficial impact.	None	
	Asset 45 – Woohouse Famhouse, Asset 46 South Ferriby Hall, Asset 47 Glentworth House Grade II Listed Buildings – all enhanced flood protection gives them slight beneficial impact.	None	
	Asset 48 – Church of St. Nicholas Grade II* Listed Building – enhanced Listed Building – slight/moderate beneficial impact.	None	
	Asset 46 – South Ferriby Hall and Asset 67 – Nos. 9 and 10 Sluice Road – impact on setting due to new embankment – slight adverse impact.	None	
Water During construction and operation	No significant residual effects identified.	None	
Land and soils During construction and operation	Loss of farmland – minor adverse impact	None	
Population and human health	Socio-economic - the short-term economic benefit of increased jobs (including local jobs) is assumed to be of minor positive significance overall.	None	

Topic	Residual effects	Potential for interaction with other topics in this ES	Sensitive receptors affected
During construction	Health, safety and well-being - the short-term adverse impacts associated with traffic, noise, dust, mud, health and safety, disruption during the construction period minor adverse significance	Yes, with visual impacts during construction	Residents and visitors to the area
	Recreation and amenity - short-term adverse impacts associated with disrupted/ reduced access to greenspace and pathway provision, noise, dust, visual impact during the construction period in a temporary residual effect of minor adverse significance	Yes, with visual impacts during construction	Residents and visitors to the area
Population and human health During operation	Socio-economic - Long-term positive impact of improved flood protection with major-beneficial significance effects are anticipated from damages to residential and commercial properties avoided as a result of flood protection.	Yes, with visual impact during operation	Residential and commercial property
	Health, safety and wellbeing - Long-term positive impacts from improved flood protection of the residents and visitors to South Ferriby, with moderate positive impacts anticipated on health.	Yes, with visual impact during operation	Residents and visitors

Step 2: Consideration of the potential for resultant combined effects both during the construction and/ or operation of the proposed scheme. This step focused on the sensitive receptors for combined effects identified in Step 1. The relevant residual inter-topic effects were considered and, applying professional judgement, the potential for significant combined effects upon the receptors was assessed with supporting commentary provided.

Table 13.2: Assessment of in-combination effects

Sensitive Receptors with Potential for Combined Effects (from Table 13.1)	Residual effects interactions (across topics)	Predicted combined effects and significance
Construction		
Residential receptors	Views from residential receptors where the embankment is close to Sluice Road – moderate	A combination of three adverse impacts occur for residential receptors, one of moderate and two of minor. Overall, due to the

Sensitive Receptors with Potential for Combined Effects (from Table 13.1)	Residual effects interactions (across topics)	Predicted combined effects and significance
	<p>adverse impact (slight adverse for houses set further away).</p> <p>Health, safety and well-being - the short-term adverse impacts associated with traffic, noise, dust, mud, health and safety, disruption during the construction period minor adverse significance</p> <p>Recreation and amenity - short-term adverse impacts associated with disrupted/ reduced access to greenspace and pathway provision, noise, dust, visual impact during the construction period in a temporary residual effect of minor adverse significance</p>	<p>temporary nature of the impacts, they are not considered significant.</p>
Operation		
Residential receptors	<p>Views from residential receptors where the embankment is close to Sluice Road – moderate adverse impact (slight adverse for houses set further away).</p> <p>Socio-economic - Long-term positive impact of improved flood protection with major-beneficial significance effects are anticipated from damages to residential and commercial properties avoided as a result of flood protection.</p> <p>Health, safety and wellbeing - Long-term positive impacts from improved flood protection of the residents and visitors to South Ferriby, with moderate positive impacts anticipated on health.</p>	<p>There is predicted to be one moderate adverse (views of embankment) and two moderate or major beneficial impacts (improved flood protection to property and improved health, safety and wellbeing). Overall the impact is therefore considered to be positive.</p>

12.2.2 Cumulative effects

Assessment of cumulative effects in this EIA has included a review of the local plans and strategies for recent, current or proposed developments, flood risk management, minerals, waste and transport projects, along with the Council's planning application information, to understand the potential for cumulative effects with other developments in the study area. Below are the developments that were considered in the cumulative effects assessment, alongside the proposed scheme:

- Humber: Hull Frontage Improvements Scheme
- Skeffling Managed Realignment Scheme
- Planning Application for clay extraction (PA/SCR/2018/2)

These are considered further below.

Humber: Hull Frontage Flood Defence Improvement Scheme

Following a detailed review of the existing tidal flood defences along the Humber edge of the city of Hull, funding was secured in December 2017 to deliver a £42 million flood defence scheme to upgrade this stretch of tidal flood defences. This is in order to better protect homes and businesses that are at risk of flooding from the Humber Estuary. This work is delivered by Hull City Council in partnership with the Environment Agency. The scheme will reduce the risk of flooding to 113,000 properties. The Environment Agency has applied for planning permission for the Humber: Hull Frontage scheme. Subject to planning approval, work on the Humber: Hull Frontage scheme will start in winter 2018 and be completed by 2020.

Given that the Humber: Hull Frontage scheme is on the north bank of the Humber and some distance away, there are considered to be no cumulative effects with the Winteringham to South Ferriby Scheme, which is on the south bank.

Skeffling Managed Realignment Scheme

We are progressing the design of a managed realignment scheme at Skeffling on the north bank of the Humber. The planning application is due to be submitted February 2019. We expect, subject to planning, enabling works to take place in summer 2019, with the main construction works to start in early 2020. Completion is expected by 2021.

Due to the distance between the Skeffling scheme (which is close to Spurn Point) and the Winteringham to South Ferriby scheme, no significant cumulative effects are predicted to occur.

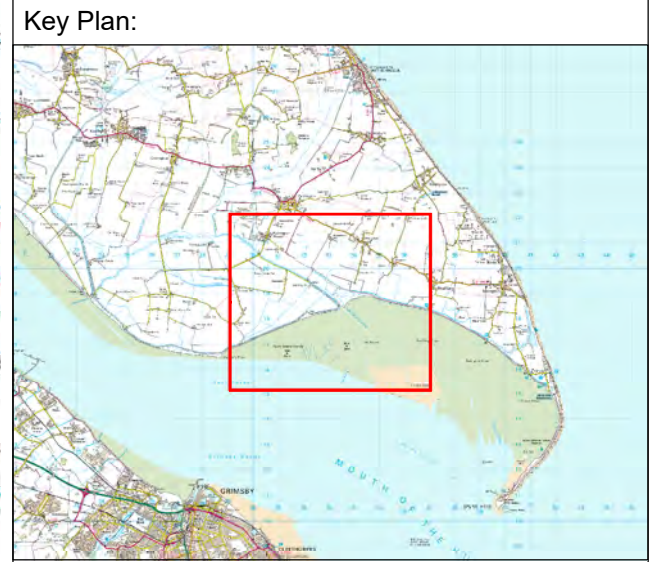
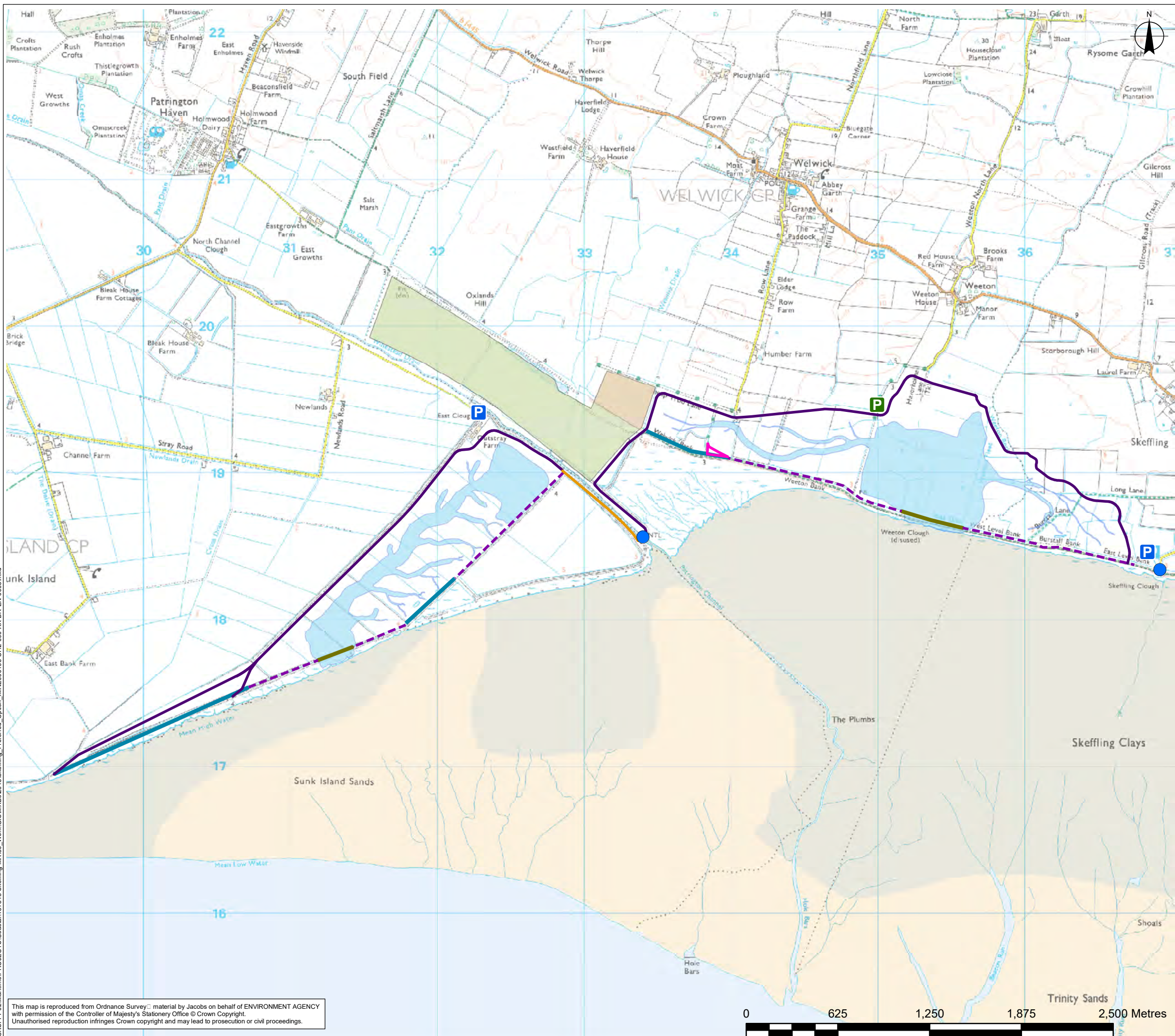
Planning Application PA/SCR/2018/2 – clay extraction

This planning application is for proposed extraction of clay for engineering purposes and is located at Sluice Lane, Winteringham. The site is located approximately 500m to the west of the Winteringham to South Ferriby scheme (at the closest location). A request for an EIA Screening Opinion was made in February 2018. NLC gave the opinion, in April 2018, that an Environmental Statement was not required. The Planning Application is still pending (as at 2 October 2018).

This Planning Application, if it receives approval, would involve the transport of clay for engineering purposes, including flood defence schemes. The number of HGVs is estimated to be up to 34 vehicle movements per day. Routes will depend on the final destination but is likely to include the A1077 initially.

Assuming worst case, that this scheme goes ahead at the same time as the Winteringham Ings to South Ferriby scheme and does not supply material to the Scheme, this would result in up to 34 HGV vehicle movements per day, plus approximately 74 vehicle movements per day from the Winteringham Ings to South Ferriby scheme using the A1077 in the vicinity of South Ferriby. This number of HGVs per day (108) is not considered likely to have a significant cumulative effect.

**Welwick to Skeffling Managed
Realignment Scheme**



- Legend**
- P Current car park location
 - P New car park location
 - Existing pumping stations
 - Proposed bank realignment
 - No works proposed to existing embankment
 - Flood embankment to be retained
 - Bank removal down to ground level
 - Breach location down to 1.5m AOD
 - Proposed creek design
 - Habitat creation and mitigation area - Outstrays
 - Habitat creation and mitigation area - Welwick to Skeffling
 - Historic landfill site

P00	13/12/18	Initial Issue	ZR	LS	Rev1	DK
Rev.	Rev.Date	Purpose of revision	Drawn	Checked	Rev'd	Appr'd

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Client

Project **OUTSTRAYS TO SKEFFLING MANAGED REALIGNMENT**

Drawing title **FIGURE 3.1 PREFERRED OPTION**

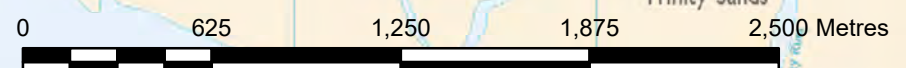
Drawing status

Scale	1:25000	DO NOT SCALE
Jacobs No.	487543	Rev
Client No.	IMNE000195	
Drawing number	IMNE000195-CH2-000-XX-DR-EN-0008	

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18 Cumulative effects

18.1 Introduction

Cumulative effects derive from a combination of multiple events or developments, which may result in greater or different effects than those resulting from an individual development. In-combination effects occur when a receptor experiences more than one type of environmental effect from the same proposed development. Cumulative effects occur as a result of the likely impacts of the proposed development interacting with the impacts of other developments in the vicinity.

This chapter assesses the in-combination and cumulative effects associated with the construction and operation of the Scheme. In-combination effects and cumulative effects with other developments are considered for each managed realignment site separately, so that the effects of each planning application are clear. The cumulative effects of both managed realignment sites (i.e. the whole Scheme) together are also assessed.

18.2 In-combination effects

18.2.1 Methodology

To determine whether there will be in-combination effects on any receptors, a review of all residual effects from the construction and operation phases of the two sites reported in topic chapters 5 to 17 was undertaken, to identify any receptors that will experience more than one type of effect. Consideration was also given to impacts with a 'negligible' magnitude that result in 'no effect' on their own (see Chapter 4 Methodology) but could result in an effect when combined with other effects. Professional judgement was used to assess whether the in-combination effects would be significant.

18.2.2 Outstrays Managed Realignment

During construction, residents of properties along or just off Outstray Road may experience an in-combination effect relating to construction traffic travelling to and from site, associated noise and dust impacts, and the restriction of access to the site for recreational use (which will be in place throughout construction anyway). Although the traffic, noise and dust impacts would not result in a residual effect on their own, when added together with the access restriction, they may result in an in-combination effect. However, this is not anticipated to be significant and will be controlled by best practice measures and the Construction Traffic Management Plan (CTMP).

Beneficial in-combination effects may occur relating to biodiversity and landscape, as hedgerow planting and reinforcement will benefit the landscape character of the area and provide habitat for farmland birds.

18.2.3 Welwick to Skeffling Managed Realignment

In-combination effects relating to traffic, dust and noise are less likely for the eastern site than the western site, as the construction traffic would be using a specially constructed access track to reach the site from the B1445. Any effect would not be significant and would be controlled by best practice measures and the CTMP.

Beneficial in-combination effects may occur relating to biodiversity and landscape, as hedgerow planting and reinforcement will benefit the landscape character of the area and provide habitat for farmland birds.

18.3 Cumulative effects

18.3.1 Methodology

Three main types of development were considered in this assessment. The study areas vary for each type, to enable a reasonable and proportionate assessment of cumulative effects. The types of development considered are:

- Recently approved, pending and prospective planning applications within 3km of the Scheme;
- Other larger developments or site allocations/policies in the wider Humber area; and
- Other proposed Environment Agency schemes in the Humber Estuary, including the consideration of the delivery of the western and eastern managed realignment sites together.

The 3 km buffer for planning applications was chosen as this area includes all the main villages close to the scheme and encompasses the study areas of the majority of assessments for the individual topics for the Scheme.

ERYC was contacted in October 2018 to request details of any planning applications (including recently approved, pending decision, and upcoming submissions) within 3 km of the Scheme, and any larger developments or site allocations/policies in the wider Humber area, that could result in cumulative effects with the Scheme. A search of the ERYC planning portal was also conducted to identify any other relevant planning applications. ERYC local plan documents were searched for relevant policies and site allocations.

The developments were assessed in combination with first the Outstrays Managed Realignment and then the Welwick to Skeffling Managed Realignment (section 18.3.2.1). Cumulative effects that could arise if the two managed realignment sites both went ahead have also been assessed (section 18.3.2.2).

The following points were considered when assessing likely significant cumulative effects:

- Types and significance of environmental effects of each development;
- Temporal and spatial overlaps of environmental effects; and
- Sensitivity of the existing environment.

18.3.2 Likely significant cumulative effects

18.3.2.1 Other developments in the study area

Table 18.1 contains an assessment of cumulative effects between other developments and the two managed realignment sites.

Table 18.1: Cumulative effects with other developments

Development	Likely significant cumulative effects	
	Outstrays Managed Realignment	Welwick to Skeffling Managed Realignment
<p>(1) 17/04319/STPLFE</p> <p>Construction of a pipeline landward of mean low water springs mark, including the landfall works, beach installation, tunnel beneath the Dimlington Cliff SSSI, installation of the pipeline into the northern boundary of Dimlington Terminal and associated outside storage, car parking and office facilities (in association with the Tolmount Offshore Gas Development) (submitted in tandem with planning application for construction of a new gas reception, separation and metering facility reference 17/04317/STPLFE)</p> <p>Approved 23/05/2018. Not commenced.</p> <p>Land North of Dimlington Terminal, Dimlington Road, Easington, HU12 0TY</p>	<p>Site is approx. 5.9 km from the Outstrays Managed Realignment but construction traffic would be within 3 km.</p> <p>Peak construction traffic flows for the development are likely to increase traffic on the B1445, which could also lead to secondary effects relating to noise, air quality and community safety. However, the peak traffic flow will be in November 2019 when no construction will be taking place on the western site. The CTMP for the western site will be cognisant of other developments in the area. No significant adverse traffic cumulative effects (or associated secondary effects) expected.</p> <p>Due to the distance between the western site and Dimlington Terminal, no other cumulative effects are anticipated during construction or operation.</p>	<p>Site is approx. 2.7 km from the Welwick to Skeffling Managed Realignment.</p> <p>Peak construction traffic flows for the development are likely to increase traffic on the B1445, which could also lead to secondary effects relating to noise, air quality and community safety. However, the peak traffic flow will be in November 2019 when no construction will be taking place on the eastern site. The CTMP for the eastern site will be cognisant of other developments in the area. No significant adverse traffic cumulative effects (or associated secondary effects) expected.</p> <p>Due to the distance between the eastern site and Dimlington Terminal, no other cumulative effects are anticipated during construction or operation.</p>
<p>(2) 17/04317/STPLFE</p> <p>Construction of a new gas reception, separation and metering facility (consisting of an emergency shut down valve (ESDV)), pig receiver, slug catcher and slug catcher separator, condensate stabilisation and metering system, methanol storage tanks, chemical injection methanol pumps, methanol recovery system, pipe rack, condensate de-watering unit, condensate stabilisation unit, condensate pre-heater and flash drum, condensate storage facilities, local</p>	<p>Site is approx. 5.9 km from the Outstrays Managed Realignment but construction traffic would be within 3 km.</p> <p>Peak construction traffic flows for the development are likely to increase traffic on the B1445, which could also lead to secondary effects relating to noise, air quality and community safety. However, the peak traffic flow will be in November 2019 when no construction will be taking place on the western site. The CTMP for the western site will be cognisant of</p>	<p>Site is approx. 2.7 km from the Welwick to Skeffling Managed Realignment.</p> <p>Peak construction traffic flows for the development are likely to increase traffic on the B1445, which could also lead to secondary effects relating to noise, air quality and community safety. However, the peak traffic flow will be in November 2019 when no construction will be taking place on the eastern site. The CTMP for the eastern site will be cognisant of other developments in the area. No significant adverse traffic cumulative effects (or associated secondary effects) expected.</p>

Development	Likely significant cumulative effects	
	Outstrays Managed Realignment	Welwick to Skeffling Managed Realignment
<p>equipment room, hot oil heating system and fired heaters); tie into existing facilities and temporary construction lay down and working areas at Perenco UK Dimlington Terminal (in association with the Tolmount Offshore Gas Development) (submitted in tandem with planning application for onshore pipeline reference 17/04319/STPLFE). Approved 23/05/2018. Not commenced.</p> <p>Perenco, Dimlington Terminal, Dimlington Road, Easington HU12 0TY</p>	<p>other developments in the area. No significant adverse traffic cumulative effects (or associated secondary effects) expected.</p> <p>Due to the distance between the western site and Dimlington Terminal, no other cumulative effects are anticipated during construction or operation.</p>	<p>Due to the distance between the eastern site and Dimlington Terminal, no other cumulative effects are anticipated during construction or operation.</p>
<p>(3) 18/00791/PLF</p> <p>Alterations to existing car park and landscaping layout to serve Engine House development (re-submission of 17/03747/PLF). Provision of 42 car parking spaces, 7 gardens and associated landscaping.</p> <p>Application validated 05/04/2018. Pending Consideration.</p> <p>Engine House Development, Enholmes Lane, Patrington, HU12 0PR</p>	<p>Approx. 2.3 km from the Outstrays Managed Realignment.</p> <p>No cumulative effects anticipated as there is no intervisibility between this development and the western site (so no landscape and visual or setting effects would occur) and they would not use the same access roads from Patrington, and the development would be built on a brownfield site so no cumulative effects relating to loss of agricultural land or habitat are anticipated to occur.</p>	<p>Approx. 3.8km from the Welwick to Skeffling Managed Realignment.</p> <p>No cumulative effects anticipated due to distance.</p>
<p>(4) 18/00822/PLF</p> <p>Erection of 4 dwellings including associated access, hard and soft landscaping (Resubmission of 17/02113/PLF).</p> <p>Application validated 04/04/2018. Pending Consideration.</p> <p>High Street Allotments, High Street, Patrington HU12 0RE</p>	<p>Approx. 2.2 km from the Outstrays Managed Realignment.</p> <p>This development is proposed on a former allotment site in the centre of Patrington, in close proximity to St Patricks Church. This development could affect the setting of Patrington Conservation Area and St Patricks Church; however, the western site would not affect the setting of these assets or views of</p>	<p>Approx. 3.9km from the Welwick to Skeffling Managed Realignment.</p> <p>No cumulative effects anticipated due to distance. The eastern site would not affect views or the setting of Patrington Conservation Area or St Patricks Church.</p>

Development	Likely significant cumulative effects	
	Outstrays Managed Realignment	Welwick to Skeffling Managed Realignment
	them. The development would result in a loss of open space, while the western site would improve access and amenity. No cumulative effects anticipated.	
(5) 17/04034/PLF Conversion of agricultural building to 3 dwellings, erection of single storey extensions to rear following demolition of existing outbuildings. Application approved 31/01/2018. Land and Buildings South of Elder Lodge, Row Lane, Welwick HU12 0SA.	Approx. 1.3 km from the Outstrays Managed Realignment. The development would result in the loss of barn owl roosts but this would be mitigated by installation of a barn owl box as specified in the planning documents. Therefore, no significant cumulative effects with the western site on barn owls are anticipated. Construction programme for the development is unknown but Row Lane would not be used to construct the western site, so no significant adverse cumulative traffic effects are anticipated.	Approx. 0.8 km from the Welwick to Skeffling Managed Realignment. The development would result in the loss of barn owl roosts but this would be mitigated by installation of a barn owl box as specified in the planning documents. Therefore, no significant cumulative effects with the eastern site on barn owls are anticipated. Construction programme for the development is unknown but Row Lane would not be used to construct the eastern site, so no significant adverse cumulative traffic effects are anticipated.
(6) England Coast Path – developed by Natural England A new National Trail around all of England's coast. Proposals are in development for the section between Humber Bridge and Easington. An Access and Sensitive Features Appraisal (including an HRA) is being completed for this project (not yet available).	The England Coast Path is anticipated to adopt the new access alignment through the western site. Likely beneficial cumulative effect on access and amenity as both projects will improve public access along the Humber Estuary shoreline. We have been working with Natural England to ensure that our Scheme and these proposals align. There is currently no PRoW along the estuary edge around Sunk Island adjacent to the western site, outside of site boundary. Any required Coast Path works in this area could occur at the same time as the construction of the	The England Coast Path is anticipated to adopt the new access alignment through the eastern site. Likely beneficial cumulative effect on access and amenity as both projects will improve public access along the Humber Estuary shoreline. We have been working with Natural England to ensure that our Scheme and these proposals align. There are unlikely to be any required Coast Path works adjacent to the eastern site outside of the site boundary as there is already a PRoW along the estuary edge to the east of the site. Therefore, no cumulative effects are anticipated during construction.

Development	Likely significant cumulative effects	
	Outstrays Managed Realignment	Welwick to Skeffling Managed Realignment
	<p>western site. However, it is assumed that any coast path works would be small in scale, such as installing gates and fencing, and therefore no adverse cumulative effects relating to disturbance of coastal waterbirds during construction activities are anticipated.</p> <p>Once both developments are operational there may be an increase in visitor numbers along the new access routes, as a result of both developments. However, a significant adverse cumulative residual effect relating to disturbance of coastal waterbirds is not anticipated, as birds would be expected to become habituated to such disturbance to some extent, and mitigation embedded in the Scheme design will minimise potential disturbance. Measures include screening, fencing and access restrictions. These measures will also protect Marsh Harrier in Haverfield Quarry, and no significant adverse cumulative residual effect is anticipated for this species due to disturbance. The HRA for the Outstrays Managed Realignment concludes no adverse effect on site integrity due to operational disturbance alone or in combination (Appendix 10.2).</p> <p>Natural England is undertaking an Access and Sensitive Features Appraisal of the Coast Path, which will include an HRA, to ensure that it will not result in adverse effects on the integrity of the Natura 2000 site.</p>	<p>Once both developments are operational there may be an increase in visitor numbers along the new access routes, as a result of both developments. However, a significant adverse cumulative residual effect relating to disturbance of coastal waterbirds is not anticipated, as birds would be expected to become habituated to such disturbance to some extent, and mitigation embedded in the Scheme design will minimise potential disturbance. Measures include screening, fencing and access restrictions. The HRA for the Welwick to Skeffling Managed Realignment concludes no adverse effect on site integrity due to operational disturbance alone or in combination (Appendix 10.2).</p> <p>Natural England is undertaking an Access and Sensitive Features Appraisal of the Coast Path, which will include an HRA, to ensure that it will not result in adverse effects on the integrity of the Natura 2000 site.</p>

Development	Likely significant cumulative effects	
	Outstrays Managed Realignment	Welwick to Skeffling Managed Realignment
<p>(7) DCO - River Humber Replacement Pipeline project between Goxhill and Paull.</p> <p>Under construction. Tunnel Boring Machine expected to reach the north side of the estuary by April 2019. The gas pipeline will be installed in spring 2020.</p>	<p>Approx. 16.5 km from the Outstrays Managed Realignment.</p> <p>Any disturbance to coastal waterbirds would be during construction and localised to the pipeline entrances. No adverse cumulative effect expected due to distance from the western site.</p> <p>No other cumulative effects are anticipated due to the distance from the site.</p>	<p>Approx. 18.7 km from the Welwick to Skeffling Managed Realignment.</p> <p>Any disturbance to coastal waterbirds would be during construction and localised to the pipeline entrances. No adverse cumulative effect expected due to distance from the eastern site.</p> <p>No other cumulative effects are anticipated due to the distance from the site.</p>
<p>(8) Environment Agency - Maintenance, ad hoc and small-scale repairs to flood defences assets around the estuary.</p> <p>Ongoing.</p>	<p>Maintenance works are consistent with the management approach in the Humber FRMS HRA (2011), and are carried out under individual Area (Yorkshire, Lincolnshire etc) Agreements. Maintenance works will be small-scale in nature, so no cumulative effects anticipated during the construction or operation of the western site.</p>	<p>Maintenance works are consistent with the management approach in the Humber FRMS HRA (2011), and are carried out under individual Area (Yorkshire, Lincolnshire etc) Agreements. Maintenance works will be small-scale in nature, so no cumulative effects anticipated during the construction or operation of the eastern site.</p>
<p>(9) 18/01058/FULL</p> <p>ERYC in partnership with the Environment Agency</p> <p>Humber: Hull Frontage Flood Defence Improvement Scheme on the Humber north bank. Major upgrade to the existing tidal flood defences along the Humber edge of the city of Hull to reduce the risk of flooding to 113,000 properties.</p> <p>Land Adjacent to Humber Estuary, Including St Andrews Quay, St Andrews Dock, William Wright Dock, Albert Dock, Island Wharf, Humber Dock Basin, Victoria Pier, Victoria Dock Village and West</p>	<p>Approx. 21km from the Outstrays Managed Realignment.</p> <p>The construction periods of both developments are anticipated to overlap. However, no adverse cumulative effects are anticipated due to the distance between the sites.</p>	<p>Approx. 25km from the Welwick to Skeffling Managed Realignment.</p> <p>The construction periods of both developments are anticipated to overlap. However, no adverse cumulative effects are anticipated due to the distance between the sites.</p>

Development	Likely significant cumulative effects	
	Outstrays Managed Realignment	Welwick to Skeffling Managed Realignment
<p>Application approved 21/12/2018.</p> <p>Preliminary works have begun. The scheme is expected to be complete by March 2021.</p>		
<p>(10) Environment Agency - Paull Holme Strays on the Humber north bank</p> <p>Works to flood embankments.</p> <p>Construction ongoing. Works are due to be completed end November 2018, with possible final work in spring 2019.</p>	<p>Approx. 13km from the Outstrays Managed Realignment.</p> <p>The construction periods of both developments are unlikely to overlap as work on the western site is expected to start in July 2019. No adverse cumulative effects are anticipated due to this and due to the distance between the sites.</p>	<p>Approx. 15km from the Welwick to Skeffling Managed Realignment.</p> <p>The construction periods of both developments are unlikely to overlap as work on the eastern site is expected to start in July 2019. No adverse cumulative effects are anticipated due to this and due to the distance between the sites.</p>
<p>(11) Environment Agency - Donna Nook Managed Realignment on the Humber south bank.</p> <p>Main works completed, possible construction works to breach the flood bank from the estuary side will be carried out in Spring 2019 (but uncertain at present), which would be expected to take approximately six weeks.</p>	<p>Approx. 23km from the Outstrays Managed Realignment.</p> <p>The construction periods of both developments are unlikely to overlap as work on the western site is expected to start in July 2019. No adverse cumulative effects are anticipated due to this and due to the distance between the sites.</p>	<p>Approx. 20km from the Welwick to Skeffling Managed Realignment.</p> <p>The construction periods of both developments are unlikely to overlap as work on the eastern site is expected to start in July 2019. No adverse cumulative effects are anticipated due to this and due to the distance between the sites.</p>
<p>(12) Environment Agency - Humber Estuary Erosion Protection (HEEP) on both Humber banks throughout the estuary.</p> <p>Minor works to improve erosion protection around the estuary. The programme of works is still to be finalised and an HRA will be completed.</p> <p>Project in development.</p>	<p>It is uncertain how close these works would be to the Outstrays Managed Realignment.</p> <p>The key effect from HEEP may be direct habitat loss in the SAC/SPA, but as the western site will be creating habitat, no cumulative effects are anticipated.</p>	<p>It is uncertain how close these works would be to the Welwick to Skeffling Managed Realignment.</p> <p>The key effect from HEEP may be direct habitat loss in the SAC/SPA, but as the eastern site will be creating habitat, no cumulative effects are anticipated.</p>

18.3.2.2 Outstrays Managed Realignment and Welwick to Skeffling Managed Realignment together

The Outstrays Managed Realignment and the Welwick to Skeffling Managed Realignment will have similar types of effects on sensitive receptors as the proposals are similar for each site. These effects are assessed for each site separately in detail in Chapters 5 to 17 and are considered together here. The only significant adverse residual effects (significant in terms of the EIA Regulations) anticipated as a result of the two sites individually are visual effects on some receptors during construction, and significant beneficial residual effects are anticipated relating to biodiversity, access and amenity and socio-economics (see summary in Chapter 19).

In terms of non-significant adverse residual effects, during construction, both sites alone are anticipated to result in residual adverse effects relating to loss of agricultural land, restricted public access, disturbance to coastal waterbirds, views from certain points and setting of some heritage assets. During operation, both sites alone are anticipated to result in adverse residual effects relating to disturbance of coastal waterbirds.

Non-significant beneficial residual effects include those relating to educational opportunities during construction for both sites, remediation of the landfill area within the Welwick to Skeffling Managed Realignment and provision of new intertidal habitat for estuarine fish species.

Given the potential for there to be similar potential environmental effects on the same receptors of both sites, combining the effects of both sites could be anticipated to result in 'additive' cumulative effects, rather than 'synergistic' effects that interact to produce a different nature of the final impact compared with the individual impacts. Potential additive effects could have a greater magnitude and therefore significance than for the individual effect.

As both sites will be constructed at the same time, construction-related noise, dust, visual effects and traffic from both sites would occur simultaneously. However, the effect on individual receptors is not anticipated to be greater than the effects reported in Chapters 5 to 17, as the combined effects, if any, remain local in scale. For example, residential properties in Weeton may experience adverse dust effects from construction works at the eastern site, but will not be affected by the works at the western site due to the distance between them.

The potential effects on terrestrial and marine biodiversity during construction relate to a loss of habitat and disturbance of protected species such as marsh harrier, coastal waterbirds, otter, reptiles and water vole. There is potential for a higher significance of effects on these receptors than from the sites alone, as the magnitude of impact on a particular receptor (e.g. a species) when combining both sites could be considered to be greater. However, the mitigation strategies for protected species and habitat planting proposals have been developed for the Scheme as a whole (both sites together), to ensure that the mitigation for each site does not conflict with mitigation or the site design of the other site. As no synergistic effects would occur, the mitigation measures proposed in chapters 10 and 11 are considered sufficient to mitigate any potential adverse cumulative effects.

Once construction is complete, long-term cumulative beneficial effects would occur with the two sites together. From a biodiversity perspective, the sites will complement each other, as they will both provide areas of new terrestrial and marine habitat which will support a variety of species and have been designed to help support the integrity of the

Humber Estuary SAC/SPA/Ramsar/SSSI. In addition, both sites will improve recreation and amenity facilities, and will contribute to the wider economy directly and indirectly. These effects are likely to be of greater significance than for each site individually.

During the operation of both sites, there would be no cumulative effects relating to a change in the hydrodynamic regime of the estuary, as the change in flow speeds at the breach locations will be localised and small-scale, and will not interact with each other.

In conclusion, it is considered that combining the proposed mitigation for each site (as set out in Chapters 5 to 17) would sufficiently reduce any adverse effects and also result in no residual significant adverse cumulative effects; therefore, no additional mitigation is proposed. The sites together are anticipated to result in cumulative beneficial effects during their operation stages.

18.4 Uncertainties, assumptions and limitations

There is no established methodology for undertaking in-combination effects assessments. Each receptor may vary in its ability to accommodate multiple effects from any one scheme or event, and so the assessment of significance of in-combination effects is subjective. The assessment was based on professional judgement.

The cumulative effects assessment with other projects was based on the limited information available about the other developments in the study area, and in some cases detailed information about construction programmes, methods and works involved were not known.

19 Summary

19.1 Beneficial effects

The Outstrays to Skeffling Managed Realignment Scheme will result in beneficial effects (before mitigation) that are 'significant' in EIA terms (moderate beneficial or better (see 4.1.3)). These include:

- Moderate beneficial effect relating to direct and indirect job creation and GVA uplift during construction for both sites;
- Major beneficial effect relating to wider economic benefits from both sites, linked to the opportunity to improve flood risk management infrastructure in Hull;
- Moderate beneficial effect relating to improved access across both sites and improved recreational facilities at the eastern site;
- Moderate to major beneficial effect on health, safety and wellbeing linked to reduced flood risk at both sites;
- Major beneficial effect on benthic habitats and species and coastal waterbirds due to the creation of new intertidal habitat (approximately 116 ha for Outstrays and 175 ha for Welwick to Skeffling); and
- Moderate beneficial effect on Landscape Character Area 21C (South Patrington, Ottringham and Keyingham Farmland) due to creation of the habitat creation and mitigation area in the western site.

In addition to these beneficial effects, some of the significant adverse effects listed in Table 19.1 and Table 19.2 will become significant beneficial residual effects once mitigation has been implemented. These mainly relate to the proposed habitat creation and mitigation area in West 2 and adjacent to East 1, which will include the creation of new wet grassland, other grassland types and sand dune habitat. The new habitats will cover an area of approximately 75 ha, will support a range of species and support the SPA, SAC, Ramsar and SSSI features of the Humber Estuary.

19.2 Adverse effects

The adverse effects of the Scheme that are deemed 'significant' in EIA terms (moderate adverse or worse) are summarised along with their proposed mitigation measures and residual effects in Table 19.1 (Outstrays Managed Realignment) and Table 19.2 (Welwick to Skeffling Managed Realignment) below. The only significant adverse effects anticipated to occur during the operational phase relate to terrestrial biodiversity.

Following the implementation of mitigation, the only residual significant adverse effects relate to temporary visual effects during construction for footpath users, passengers and crew on ships in the estuary, and a number of nearby properties. As mentioned above, several of the potentially significant adverse effects on biodiversity will become significant beneficial residual effects once mitigation is implemented, due to the proposed habitat creation in West 2 and adjacent to East 1.

19.2.1 Outstrays Managed Realignment summary

Table 19.1: Outstrays Managed Realignment adverse effects, mitigation and residual effects summary

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Residual effect and significance in terms EIA regulations
Water environment - construction				
Ponds (within Haverfield Quarry) Sensitivity/value: High	Risk of silt pollution from earthworks Magnitude: Moderate negative	Moderate Adverse	Best practice measures will be set out in the CEMP, surface water management plan and silt management plan	No effect EIA regulations: Not Significant
Ponds (within Haverfield Quarry) Sensitivity/value: High	Risk of pollution from use of polluting substances. Magnitude: Moderate negative	Moderate Adverse	Best practice measures will be set out in the CEMP, including surface water management plan	No effect EIA regulations: Not Significant
Winestead Drain Sensitivity/value: Medium	Use of water for dust suppression affecting flows and dilution capacity and water quality. Magnitude: Moderate negative	Moderate adverse	Adherence to any conditions for abstraction licences for larger abstractions. Use of water from the estuary for dust suppression in saline-exposed areas of the MR site following the works. Investigate potential storage of rainwater for dust suppression.	No effect EIA regulations: Not Significant
Terrestrial biodiversity - construction				
Humber Estuary SSSI Sensitivity/value: National Importance	Damage/Habitat Loss at Humber Estuary SSSI - construction of the piling wall at Welwick Bushes. Magnitude: Very low	Significant Negative impact (Certain) at a Local Level in the Short to Medium Term (1-3 years)	The works footprint will be minimised where possible. Grassland will be reinstated after construction.	Significant Positive impact (Probable) at a National Level in the Medium to Long Term (up to 5 years), when thin, impoverished soils have developed on the raw sand and the grassland develops in Field C.

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Residual effect and significance in terms EIA regulations
			Up to 10.1 ha of new sand dune habitat will be created in West 2.	
Winestead Drain cLWS Sensitivity/Value: District Importance	Degradation of water quality at Winestead Drain cLWS. Increased run off from arable farmland in to Winestead Drain is anticipated, due to the creation of new outlet channels as part of the wet grassland habitat creation. Magnitude: Very Low	Significant Negative impact (Possible) at a Local Level in the Short Term (up to 1 year following construction).	Standard site procedures, including adherence to Guidelines for Pollution Prevention, will be adopted for any works near or in water to ensure pollutants do not enter aquatic environments. Sediment traps will be installed at the outlets in the short term.	No significant impact (Probable) at a Local Level in the Medium Term (3-5 years), when the grassland develops in the West 2 habitat creation and mitigation area.
Scrub Sensitivity/Value: Local Importance	Loss of Outstray Scrapes (1.2 ha of scrub) and removal of scrub in Haverfield Quarries LWS as part of habitat restoration (up to 2.4 ha) Magnitude: Medium	Significant Negative impact (Certain) at a Local Level.	Up to 2 ha of scrub planting in West 2 habitat creation and mitigation area.	No significant impact (Certain) at a Local Level in the Long Term (up to 10 years), when the scrub develops and matures in West 2 habitat creation and mitigation area.
Neutral semi-improved grassland Sensitivity/value: Regional Importance	Loss of West 1 and West 2 embankments. Direct, temporary loss of up to 5.9 ha of neutral semi-improved grassland. Magnitude: medium	Significant Negative impact (Certain) at a Regional Level in the Short Term (1-2 years).	Turf is proposed to be translocated to the new embankment. Up to 10 ha of additional embankment is also proposed to be created. Up to 15 ha of arable field is proposed to be reverted to species	Significant Positive impact (Certain) at a Regional Level in the Medium Term (3-5 years), when the grassland develops in West 2 habitat creation and mitigation area.

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Residual effect and significance in terms EIA regulations
			rich grassland in the West 2 habitat creation and mitigation area.	
Marshy grassland Sensitivity/value: District Importance	Loss of Outstray Scrapes. Permanent loss of up to 2 ha of marshy grassland. This represents all the marshy grassland habitat within the Scheme Extents. Magnitude: High	Significant Negative impact (Certain) at a District Level.	Up to 28 ha of wet grassland will be created in West 2 (arable reversion to wet grassland).	Significant Positive impact (Certain) at a Regional Level in the Medium Term (3-5 years) when the grassland in the West 2 habitat creation and mitigation area develops.
Standing water Sensitivity/value: Local Importance	Loss of Outstray Scrapes. Permanent loss of three small to medium sized ponds. Total area is 0.16 ha. Apart from the ponds associated with Haverfield Quarry, this represents all ponds within the Scheme Extents. Magnitude: Medium	Significant Negative impact (Certain) at a Local Level.	Up to 14 ponds (approximately 1 ha), 10 dune slack pools (approximately 1 ha) and 2 lagoons with islands (approximately 3 ha), will be created in the West 2 habitat creation and mitigation area. These will be variety of designs (size and shape) to benefit the target ecological receptors.	Significant Positive impact (Certain) at a Regional Level in the Medium Term (3-5 years) when the ponds establish.
Running water Sensitivity/value: Local Importance	Managed realignment - direct loss of 4.8 km of running water (agricultural drainage channels). Magnitude: Medium	Significant Negative impact (Certain) at a Local Level.	Up to 2 km of new channel and up to a further 2 km of linear scrapes are proposed to be created in the West 2 habitat creation and mitigation area.	No Significant impact (Certain) at a Local Level in the Short Term (up to 1 year after construction), when the watercourse develops and matures.
Hedgerows Sensitivity/value: Local Importance	Managed realignment - direct loss of approximately 1.8 km of hedgerow. Magnitude: medium	Significant Negative impact (Certain) at a Local Level.	Hedgerow across the northern boundary of West 1 is proposed to be improved through additional planting and ongoing management.	No Significant impact (Certain) at a Local Level in the Long Term (up to 10 years), when the new hedgerow in West 1 develops and matures.

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Residual effect and significance in terms EIA regulations
Spread of non-native invasive species (NNIS)	Potential spread of NNIS across the site and into the wild, which would contravene legislation. Magnitude: Very low	Significant Negative effect (Probable) at a Local Level in the Medium Term (up to 5 years).	NNIS management and clearance. Ongoing monitoring will be undertaken by the ECoW to ensure NNIS are not spread by the works.	No Significant effect (Probable) at a Local Level in the Short Term (during construction).
Marsh harrier Sensitivity/value: National Importance	Disturbance from construction activities, would result in the likely abandonment of the site, for all breeding females given their proximity to the works. Magnitude: High	Significant Negative effect (Probable) at the National Level in the Short Term (during construction).	Works timed to avoid marsh harrier breeding season. No works within a 200 m buffer of any marsh harrier nests.	No Significant effect (Certain) at the National Level in the Short Term (during construction).
Marsh harrier Sensitivity/value: National Importance	Loss of marsh harrier foraging habitat. Possible negative effect on female marsh harrier foraging success for up to five years. There are alternative unaffected foraging habitats to the north of Haverfield Quarry and at Welwick Saltmarsh. Magnitude: Low	Significant Negative effect (Possible) at the District Level in the Medium Term (up to 5 years).	The West 2 habitat creation and mitigation area will provide an extensive area of new high-quality terrestrial and aquatic habitats for marsh harrier population, which could facilitate an expansion in the marsh harrier population (approximately 2 ha of reedbed over three locations).	Significant Positive effect (Possible) at the National Level in the Medium Term (up to 5 years).
Barn owl Sensitivity/value: District Importance	Temporary displacement from site (due to loss of foraging habitat and/or disturbance). Negative effect on hunting success for up to 2 years. Alternative foraging habitat is available outside of the scheme boundary. Magnitude: Low	Significant Negative effect (Probable) at a Local Level in the Medium Term (up to 5 years).	No night time working is proposed during construction. Grassland habitat creation in West 2. Habitats managed to promote high field vole population. All barn owl boxes (which are currently damaged/defunct) will be reinstated after construction.	Significant Positive effect (Probable) at a District Level in the Medium Term (3-5 years) when the new habitats develop, and small mammal population establishes and expands. The reinstated/new barn owl boxes will allow the future expansion of the barn owl population.

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Residual effect and significance in terms EIA regulations
<p>Farmland birds</p> <p>Sensitivity/value: District Importance</p>	<p>Negative effect on breeding success through the reduction in nesting and foraging opportunities.</p> <p>Permanent loss of approximately 30-40% of the nesting and foraging habitat.</p> <p>Loss of arable fields.</p> <p>Magnitude: Medium</p>	<p>Significant Negative effect (Certain) at the Local Level.</p>	<p>Vegetation clearance outside of the breeding bird period (March – August inclusive) to avoid contravening legislation.</p> <p>Replacement scrub and hedgerow planting.</p> <p>Up to 20 schwegler nest boxes will be installed in Haverfield Quarries LWS.</p>	<p>Direct impacts on nesting farmland birds are avoided during construction.</p> <p>Unavoidable loss of nesting and foraging habitat. Probable negative effect on farmland bird nesting and foraging success during construction.</p> <p>No Significant effect (Certain) at a District Level in the Medium to Long Term (up to 10 years), when the scrub, hedgerow and other habitats associated with the West 2 habitat creation and mitigation area develop and mature.</p>
<p>Reptiles</p> <p>Sensitivity/value: Regional Importance</p>	<p>Removal of West 1 embankment. Permeant loss of reptile population along the West 1 embankment and Outstray Scrapes. Population unlikely to recover in the long term.</p> <p>Magnitude: High</p>	<p>Significant Negative impact (Certain) at the Regional level.</p>	<p>Reptile mitigation strategy: translocation and habitat creation in the West 2 habitat creation and mitigation area.</p>	<p>There is likely to be some minor unavoidable losses during construction, which could impact the conservation status of local reptile populations.</p> <p>Significant Positive effect (Possible) at a District Level in the Medium Term (up to 5 years) when the new habitats develop in West 2 habitat creation and mitigation area, and the reptile population expands into these new habitats.</p>
<p>Water Vole</p> <p>Sensitivity/value: District Importance</p>	<p>Potential for temporary displacement from East Clough/Newlands Drain, due to regular visual and noise disturbance to the south of East Clough.</p>	<p>Significant Negative effect (Unlikely) at the Local Level in the Short Term (during construction).</p>	<p>A pre-works inspection to determine the presence or likely absence. No mitigation required if absence confirmed. If presence is confirmed, exclusion zones will be created.</p>	<p>No significant (Certain) effect at a Local Level in the Short Term (during construction).</p>

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Residual effect and significance in terms EIA regulations
	Magnitude: Low			
Otter Sensitivity/value: Regional Importance	Possible temporary displacement of otter population from Haverfield Quarry and abandonment of site, during construction. Magnitude: High	Significant Negative effect (Possible) at a Regional Level in the Short Term (During Construction).	No works are proposed in West 2 during the marsh harrier breeding period (March to August inclusive). No night working will be carried out in West 2. Pathways to and from Haverfield Quarry will be maintained during construction. Standard mitigation will be applied.	No significant (Probable) effect at a District Level in the short term (during construction).
Great crested newt Sensitivity/value: Local Importance	Incidental mortality during site clearance/construction. Possible risk of GCN being present in West 2 during construction and possible risk of killing and injuring or disturbing GCN, if present. Magnitude: Very Low	Significant Negative effect (Possible) at a less than Local Level in the Short Term (during construction).	Works will be carried out under licence, to ensure compliance with legislation. Up to 14 ponds will be created in the West 2 habitat creation and mitigation area. These will be designed and managed to provide new habitat for great crested newt and other species.	Significant Positive effect (Probable) at a District Level in the Medium Term (up to 5 years) when the new habitats develop, and the great crested newt population expands.
Badger Sensitivity/value: Local Importance	Loss of a single outlier sett and suspected annex sett. Probable temporary disturbance of up to six outlier setts and possible temporary disturbance of main sett. Magnitude: Low	Significant Negative effect (Certain) at a less than Local Level in the short term (during construction).	A badger mitigation strategy will be developed from the results of further survey and monitoring work. The strategy will include the closure of one outlier sett (Outstray Scrapes) and the annex sett (Welwick Bushes). Exclusion zones will be created to protect remaining setts.	No Significant (Probable) effect at a Local Level in the Short Term (during construction).
Badger Sensitivity/value: Local Importance	Permanent loss of badger foraging habitat in the West 1,	Significant Negative effect	The hedgerow along the northern boundary of West 1 provides important cover and foraging for the local badger population and will	No Significant effect (Probable) at a Local Level in the Medium Term (up

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Residual effect and significance in terms EIA regulations
	including arable farmland and the scrub habitat. As the adjacent landscape is dominated by arable fields like those in West 2, there is ample alternative habitat for this species. Magnitude: Low	(Unlikely) at a less than Local Level.	be retained and enhanced through additional planting.	to 5 years) when the new hedgerow develops in West 1.
Amphibians (except great crested newt) Sensitivity/value: Local Importance	The loss of Outstray Scrapes will result in the permanent loss of amphibian habitat and therefore populations at this location. Magnitude: High	Significant Negative impact (Certain) at the Local Level .	Amphibians will be captured alongside reptiles at Outstray Scrapes (as per Reptile Mitigation Strategy). These will be translocated to the newly created ponds in the West 2 habitat creation and mitigation area.	Significant Positive effect (Probable) at a Local Level in the Medium Term (3-5 years) when the new ponds develop, and the amphibian population expands.
Sea aster mining bee Sensitivity/value: National Importance	Construction activities, in particular the presence of site workers, could possibly cause damage the sea aster mining bee colony in West 2. Magnitude: Low	Significant Negative effect (possible) at a District Level in the Short Term (during construction).	Exclusion zones created around sea aster mining bee nests during construction. These will demarcate the location of the nests and ensure the entrances are not blocked or damaged. A dune grassland with associated ponds and islands are proposed to be created in Field C.	Significant Positive effect (Possible) at a National Level in the Medium Term (up to 5 years), when the fixed sand dune habitat develops and matures.
Brown hare Sensitivity/value: Local Value	Construction activities could possibly cause the temporary displacement of brown hare from West 2. Magnitude: Low	Significant Negative impact (Possible) at the less than Local Level in the Short Term (During construction).	No works are proposed in West 2 during the marsh harrier breeding period (March to August inclusive). No night working will be carried out in West 2.	No Significant effect (Probable) at a Local Level in the Short Term (during construction).

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Residual effect and significance in terms EIA regulations
Terrestrial biodiversity - operation				
Marsh Harrier Sensitivity/value: National importance	Increased number of visitors to Haverfield Quarry, causing increased disturbance to nesting Marsh Harrier. Magnitude: High	Significant Negative effect (Possible) at the National Level.	Access will be restricted to designated bridleway only and screening/fencing will be put in place. The bird hide between the two main ponds at Haverfield Quarry will be reinstated.	No Significant (Probable) effect at a National Level.
Otter Sensitivity/value: Regional importance	Increased number of visitors to Haverfield Quarry, causing increased disturbance to otter. Magnitude: High	Significant Negative effect (Possible) at the National Level.	Access will be restricted to designated bridleway only and screening/fencing will be put in place.	No Significant (Probable) effect at a Regional Level.

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Residual effect and significance in terms EIA regulations
Marine biodiversity - construction				
Saltmarsh habitat and associated species Sensitivity/value: High	Removal of approx. 1 ha saltmarsh at breach location. Magnitude: Small	Moderate adverse effect	Creation of between 65 and 80 ha initially and between 90 to 105 ha after five years of breaching.	Moderate beneficial EIA regulations: Significant
Landscape and visual amenity - construction				
Viewpoint 1 - East Bank Road, Sunk Island Sensitivity/value: High for residential receptors	Construction vehicles and construction activity will be discernible for the closest receptors. Magnitude: Moderate negative	Short term moderate, adverse effect for five residential receptors	No mitigation available.	Moderate adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant
Viewpoint 2 -East Bank Road, Sunk Island Sensitivity/value: High for residential receptors	Construction vehicles and construction activity will be discernible for the closest receptors. Magnitude: Moderate negative	Short-term, moderate, adverse effect for six residential receptors	No mitigation available.	Moderate adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant
Viewpoint 3 – Newland Road Sensitivity/value: High for residential receptors	Construction vehicles and the site compound will be partially visible. Magnitude: Moderate negative	Short-term, moderate, adverse effect for two residential receptors	No mitigation available.	Moderate adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant
Viewpoint 4 – Eastgrowths Farm/ Patrington Bridleway	Construction vehicles and the site compound will be partially visible. Magnitude: Moderate negative	Short-term, moderate, adverse effect for residents and bridleway users	No mitigation available.	Moderate adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Residual effect and significance in terms EIA regulations
No. 6 and No. 5, east of Patrington Haven Sensitivity/value: High for residential receptors and bridleway users				
Air quality - construction				
Ecological receptors Sensitivity/value: High	Dust emissions from construction vehicles and construction activities. Magnitude: Small during Demolition Large during Earthworks Medium during Trackout	Medium during Demolition High during Earthworks Medium during Trackout	Best practice and standard dust mitigation measures are put in place prior to the commencement and during the construction phase and will be documented in the CEMP.	No effect EIA regulations: Not Significant

19.2.3 Welwick to Skeffling Managed Realignment summary

Table 19.2: Welwick to Skeffling Managed Realignment adverse effects, mitigation and residual effects summary

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Significance in terms of residual effect/EIA regulation
Terrestrial biodiversity – construction				
Neutral semi-improved grassland Sensitivity/value: Regional Importance	Loss of East 1, East 2 and East 3 embankment. Direct, temporary loss of up to 5.3 ha of neutral semi-improved grassland. Magnitude: High	Significant Negative impact (Certain) at a Regional Level in the Short Term (1-2 years) due to the direct loss of grassland along the embankments.	Turf will be translocated to the new embankment. Up to 9 ha of additional embankment will also be created. Up to 7 ha of arable field will be reverted to species rich grassland in the Welwick to Skeffling habitat creation and mitigation area.	Significant Positive impact (Certain) at a Regional Level in the Medium Term (3-5 years), when the grassland develops in the Welwick to Skeffling habitat creation and mitigation area.
Standing water Sensitivity/value: Local Importance	Managed realignment - loss of two ponds in East 1, a single pond in East 2 and five small to medium sized ponds in East 3. Two defunct drains, which are effectively acting as ponds, will be retained. Magnitude: High	Significant Negative impact (Certain) at a Local Level .	Up to seven ponds (03. ha) are proposed to be created in the Welwick to Skeffling habitat creation and mitigation area.. Two existing ponds will be improved.	Significant Positive impact (Certain) at a Local Level in the Medium Term (3-5 years) when the ponds establish.
Running water Sensitivity/value: Local Importance	Managed realignment - direct loss of 4 km of running water (agricultural drainage channels). Magnitude: Medium	Significant Negative impact (Certain) at a Local Level .	Drainage channel approximately 4.4 km in length will be created along the dry-side toe of the new embankment. Detailed specifications for the design of the drains will be produced to benefit the target receptors.	No Significant impact (Certain) at a Local Level in the Short Term (up to 1 year after construction), when the watercourse develops and matures.
Hedgerows Sensitivity/value: Local Importance	Managed realignment - direct loss of 2.6 km of hedgerow. Magnitude: Medium	Significant Negative impact	Hedgerows within the Welwick to Skeffling habitat creation and mitigation area are proposed to be	Significant Positive effect (Certain) at a Local Level in the Long Term

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Significance in terms of residual effect/EIA regulation
		(Certain) at a Local Level.	improved through additional planting and ongoing management. A new hedgerow will be provided along the boundary of the site where possible, in East 2 and 3.	(up to 10 years), when the new hedgerows develops and matures.
Potential spread of non-native invasive species (NNIS)	Potential spread of NNIS across the site and into the wild, which would contravene legislation. Magnitude: Very low	Significant Negative effect (Possible) at a Local Level in the Medium Term (up to 5 years), when the NNIS spread, develop and invade valued natural and semi-natural habitats.	NNIS management and clearance. Ongoing monitoring will be undertaken by the ECoW to ensure NNIS are not spread by the works. The scheme represents an opportunity to eradicate all non-native invasive species from the Scheme extents.	No Significant effect (Probable) at a Local Level in the Short Term (during construction).
Marsh harrier Sensitivity/value: National Importance	Disturbance from construction activities would result in the likely abandonment of the site, for all breeding females given their proximity to the works. Magnitude: High	Significant Negative effect (Probable) at the National Level in the Short Term (during construction).	Works timed to avoid marsh harrier breeding season. No works within a 200 m buffer of any marsh harrier nests.	No Significant effect (Certain) at the National Level in the Short Term (during construction).
Marsh harrier Sensitivity/value: National Importance	Loss of marsh harrier foraging habitat. Possible negative effect on female marsh harrier foraging success for up to five years. There are alternative unaffected foraging habitats to the north of Haverfield Quarry and at Welwick Saltmarsh. Magnitude: Low	Significant Negative effect (Possible) at the District Level in the Medium Term (up to 5 years).	Habitat creation adjacent to East 1.	Significant Positive effect (Possible) at the National Level in the Medium Term (up to 5 years).
Barn owl	Temporary displacement from site (due to loss of foraging habitat)	Significant Negative effect	No night time working is proposed during construction.	Significant Positive effect (Probable) at a District Level in the

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Significance in terms of residual effect/EIA regulation
Sensitivity/value: Regional Importance	and/or disturbance). Negative effect on hunting success for up to 2 years. Alternative foraging habitat is available outside of the scheme boundary. Magnitude: Low	(Probable) at a District Level in the Medium Term (up to 5 years).	Grassland habitat creation in Welwick to Skeffling habitat creation and mitigation area. Habitats managed to promote high field vole population.	Medium Term (3-5 years) when the new habitats develop, and small mammal population establishes and expands.
Barn owl Sensitivity/value: Regional Importance	Removal of two barn owl boxes. Magnitude: Medium	Significant Negative effect (Certain) at a District Level	Two barn owl boxes will be fitted after construction. One will be fitted in the habitat creation and mitigation area. One will be fitted on a retained section of Burstall Bank.	No Significant effect (Certain) at a District Level in the Short Term (after construction).
Farmland birds Sensitivity/value: Local Importance	Negative effect on breeding success through the reduction in nesting and foraging opportunities. Direct loss of 2.6 km of hedgerow (approximately 66% of hedgerows on site). Loss of arable fields. Magnitude: Medium	Significant Negative effect (Certain) at the Local Level.	Vegetation clearance outside of the breeding bird period (March – August inclusive) to avoid contravening legislation. Replacement scrub and hedgerow planting where possible.	Unavoidable negative effect on farmland bird nesting and foraging success during construction. No Significant effect (Certain) at a District Level in the Medium to Long Term (up to 10 years), when habitats develop and mature.
Reptiles Sensitivity/value: Regional Importance	Permanent loss of reptile population along the East 1, East 2 and East 3 embankment. Population unlikely to recover in the long term. Magnitude: High	Significant Negative impact (Certain) at the Regional level.	Reptile mitigation strategy: translocation and habitat creation.	There is likely to be some minor unavoidable losses during construction, which could impact the conservation status of local reptile populations. Significant Positive effect (Possible) at a District Level in the Medium Term (up to 5 years) when the new habitats develop in the habitat creation and mitigation area, and the reptile population expands into these new habitats.
Water Vole	Permeant displacement from the drainage channels in East 1, 2	Significant Negative impact	Water Vole Mitigation Strategy: translocation and habitat creation	Significant Positive effect (Probable) at the District Level in

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Significance in terms of residual effect/EIA regulation
Sensitivity/value: District Importance	and 3 during construction, due to the tidal inundation. Magnitude: High	(Certain) at the District Level in the Short Term (during construction).		the Medium Term (up to 5 years), when the drainage ditch and ponds develop and mature.
Otter Sensitivity/value: Regional Importance	The presence of site workers and machinery along Welwick Drain and Soak Dike could disturb otters whilst they try to access Haverfield Quarry and Welwick Saltmarsh. This would affect the ability of otter to access or leave Haverfield Quarry. Magnitude: Low	Significant Negative effect (Possible) at a Regional Level in the Short Term (During Construction).	No night working will be carried out in West 2. Pathways to and from Haverfield Quarry will be maintained during construction. Standard mitigation will be applied.	No Significant (Probable) effect at a District Level in the Short Term (during construction).
Great crested newt Sensitivity/value: Local Importance	Possible risk of GCN being present in East 1 and East 2 during construction and possible risk of killing and injuring or disturbing GCN, if present. Humber Farm meta population. Magnitude: Very low	Significant Negative effect (Possible) at a less than Local Level in the Short Term (during construction).	Works will be carried out under licence, to ensure compliance with legislation. Mitigation will be applied through licence application.	Significant Positive effect (Probable) at a District Level in the Medium Term (up to 5 years) when the new habitats develop and the great crested newt population expands.
Badger Sensitivity/value: Local Importance	The managed realignment in East 1, East 2 and East 3 will permanently displace badgers and reduce the available foraging habitat for the local badger population. Magnitude: Low	Significant Negative effect (Unlikely) at a less than Local Level.	New hedgerow along the boundary of the site where possible in East 2 and East 3. Improvements to hedgerow in habitat creation and mitigation area and creation of foraging habitat.	No Significant effect (Probable) at a Local Level in the Medium Term (up to 5 years) when the new hedgerow develops.

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Significance in terms of residual effect/EIA regulation
Sea aster mining bee Sensitivity/value: National importance	The cessation of sheep grazing over a two-year period during construction could cause the entrances of the sea aster mining bee nests to vegetate over. This could degrade the value of the nesting habitat by restricting or blocking access to the exposed sandy banks. Magnitude: Medium	Significant Negative effect (possible) at a National Level in the Short Term (during construction).	Vegetation around the entrance and base of the nests will be carefully cleared by hand at the end of July or early August, prior to the bee emerging. This will help maintain the exposed vertical sandy banks across Welwick Bushes. Works will be carried out by the main contractor and overseen by the ECoW.	No Significant effect (Certain) at a National Level in the Short Term (during construction).
Terrestrial Biodiversity – operation				
Marsh Harrier Sensitivity/value: National importance	Increased number of visitors to Haverfield Quarry, causing increased disturbance to nesting Marsh Harrier. Magnitude: High	Significant Negative effect (Possible) at the National Level .	Access will be restricted to designated bridleway only and screening/fencing will be put in place. The bird hide between the two main ponds at Haverfield Quarry will be reinstated.	No Significant (Probable) effect at a National Level .
Sea aster mining bee Sensitivity/value: National importance	Operational activities, in particular the presence of additional visitors, could possibly cause damage the sea aster mining bee nests at Welwick Bushes.	Significant Negative effect (Possible) at the National Level .	The managed realignment will provide an extensive area of additional saltmarsh habitats and foraging opportunities for sea aster mining bee population, which could facilitate an expansion in the sea aster mining bee population.	Significant Positive effect (Possible) at a Regional Level in the Short to Medium Term (up to 5 years), when the saltmarsh habitat develops and matures.

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Significance in terms of residual effect/EIA regulation
Marine biodiversity – construction				
Saltmarsh habitat and associated species Sensitivity/value: High	Removal of approx. 2.5 ha saltmarsh at breach location. Magnitude: small	Moderate adverse	Creation of between 68 and 108 ha initially and between 127 to 147 ha after five years of breaching.	Moderate beneficial EIA regulations: Significant
Landscape and visual amenity – construction				
Viewpoint 7 – Welwick Bank near Welwick Bushes Sensitivity/value: Public footpath users/recreational receptors: high. Ferry passengers: medium	Construction vehicles and construction activity being visible and the public footpath will need to be diverted. Magnitude: Moderate negative	Major, adverse effect for recreational receptors walking on roads to the north Moderate short-term effect on ferry passengers	No mitigation available.	Major adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant Moderate adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant
Viewpoint 8 – Row Lane, south of Welwick Sensitivity/value: Residential receptors: High.	Construction vehicles and construction activity will be noticeable for the closest receptors. Magnitude: Moderate negative	Short term, moderate, adverse effect for the closest residential receptors	No mitigation available.	Moderate adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant
Viewpoint 9 – Humber Side Road, south of Weeton Sensitivity/value: Residential receptors: High	Construction vehicles and the site compound being visible. Magnitude: Moderate negative	Short term, moderate, adverse effect for residents	No mitigation available.	Moderate adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Significance in terms of residual effect/EIA regulation
Viewpoint 10 – B1445 Skeffling Road, east of Weeton Residential receptors: high	Construction vehicles and the site compound being visible. Magnitude: Moderate negative	Short term moderate, adverse effect for residential receptors	No mitigation available.	Moderate adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant
Viewpoint 11 – Church Road, south of Skeffling Residential receptors and footpath users: high	Construction vehicles and construction activity will be noticeable for the closest receptors and an existing public footpath will need to be diverted. Magnitude: Moderate negative	Short term major, adverse visual effect for footpath users	No mitigation available.	Major adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant
		Moderate, adverse short-term effect for residents		Moderate adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant
Viewpoint 12 – Skeffling Footpath No. 4 (Coastal Path), South End Bank, Humber Lane Footpath users: high. Ferry passengers: medium	Views through to the site with construction vehicles and construction activity being visible and the public footpath will need to be diverted. Magnitude: Major negative	Short term major, adverse effect for recreational receptors	No mitigation available.	Major adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant
		Short term moderate adverse effect for ferry passengers		Moderate adverse effect. However, this will be short term as it will occur during construction only. EIA regulations: Significant
Historic environment – construction				
Asset 32 Enclosure complex Sensitivity/value: Medium	Partial removal during topsoil stripping for compound / car park. Magnitude: Moderate negative	Moderate adverse	Archaeological watching brief and recording	Minor adverse EIA regulations: Not Significant

Receptor and sensitivity/value	Description of impact and magnitude	Significance of effect	Mitigation	Significance in terms of residual effect/EIA regulation
Asset 33 Group 1 enclosure Sensitivity/value: Medium	Partial removal by construction activities. Magnitude: Major negative	Moderate adverse	Strip, map and record	Minor adverse EIA regulations: Not Significant
Asset 36 Group 4 medieval remains Sensitivity/value: Low	Potential partial removal by construction activities. Magnitude: Major negative	Moderate adverse	Strip, map and record	Minor adverse EIA regulations: Not Significant
Air quality – construction				
Ecological receptors Sensitivity/value: High	Dust emissions from construction vehicles and construction activities. Magnitude: Small during Demolition Large during Earthworks Medium during Trackout	Medium during Demolition High during Earthworks Medium during Trackout	Best practice and standard dust mitigation measures are put in place prior to the commencement and during the construction phase and will be documented in the CEMP.	No effect EIA regulations: Not Significant

19.3 Cumulative effects

There are not anticipated to be any significant adverse in-combination effects (different effects on the same receptor) for either managed realignment site, or cumulative effects arising from either site with other proposed developments in the vicinity.

In considering both the Outstrays and the Welwick to Skeffling Managed Realignment sites together, no significant adverse cumulative effects are anticipated, but significant beneficial cumulative effects are likely to occur in relation to biodiversity, access and amenity, socio-economics and human health.

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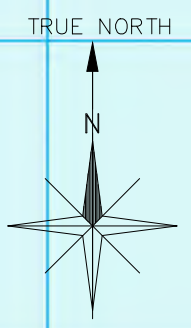
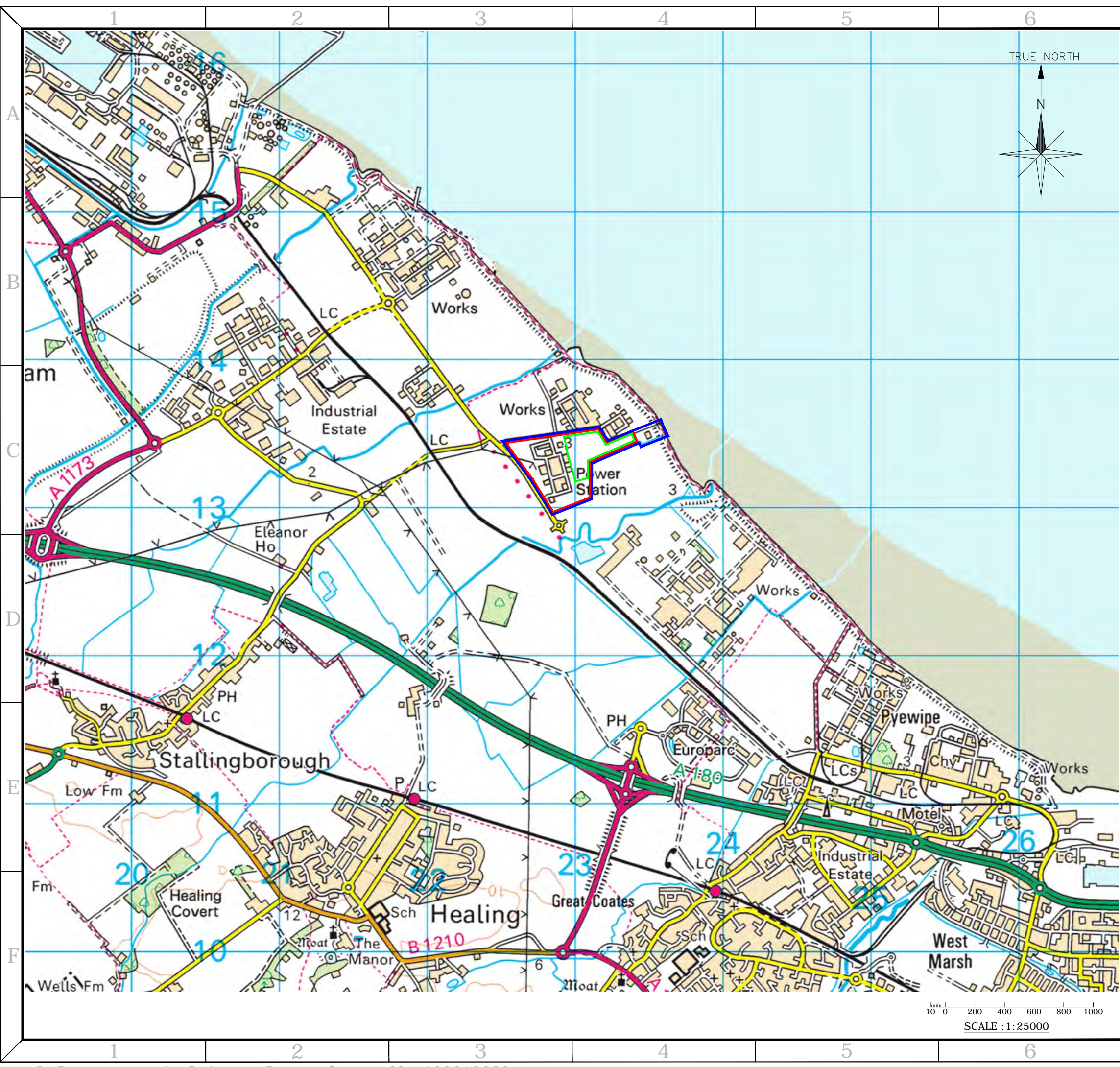
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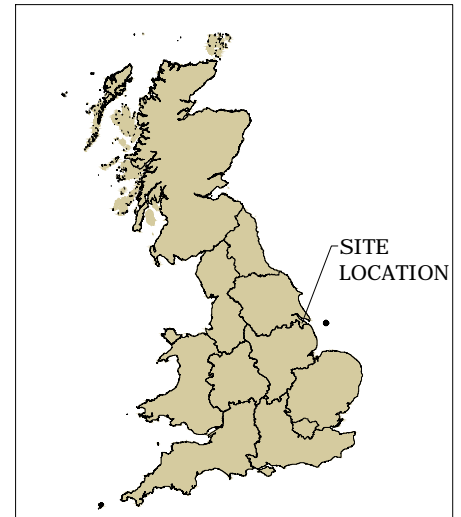
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South Humber Bank Energy Centre



FOR LOCAL AUTHORITY PLANNING PURPOSES ONLY



LOCATION PLAN

- LAND CONTROLLED BY APPLICANT
- PLANNING APPLICATION BOUNDARY
- MAIN DEVELOPMENT AREA

R2	FOR APPROVAL	AO	TO	20.12.18
R1	FOR APPROVAL	AO	TO	30.11.18
REV.	DETAILS OF REVISION	DRAWN	CHKD	DATE



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SITE:	SOUTH HUMBER BANK		
PROJECT:	SOUTH HUMBER BANK ENERGY CENTRE		
TITLE:	SITE LOCATION PLAN		

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17.0 CUMULATIVE AND COMBINED EFFECTS

17.1 Introduction

17.1.1 This Chapter of the Environmental Statement (ES) provides an assessment of the potential for cumulative and combined effects to occur as a result of the Proposed Development. It draws on the assessment of impacts provided in Chapters 7 to 16 of this ES, and information in the public domain relating to other known developments within the Study Area. This assessment does not consider developments that are already constructed and operating, as existing operational facilities are accounted for in the baseline conditions established for the main assessments within Chapters 7 to 16 of this ES.

17.1.2 This Chapter is supported by Figure 17.1 in ES Volume II

17.2 Legislation and Planning Policy Context

17.2.1 The requirement for cumulative and combined impact assessments is stated in the relevant European Directive and domestic legislation, as detailed below:

- European Directive 2014/52/EU on the assessments of effects of certain public and private projects on the environment requires an assessment of *“the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium term and long-term, permanent and temporary, positive and negative effects of the project”*.
- Schedule 4 Part 5 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 as amended which states the following: *“The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development...”*; and
- Schedule 4, (5)(e) of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 as amended (Information for the inclusion in Environmental Statements) states the following required: *“a description of the likely significant effects of the development on the environment resulting from, inter alia (e) the cumulation of effects with other existing and / or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.”*

17.3 Assessment Methodology

Impact Assessment and Significance Criteria

17.3.1 There is no standard prescriptive method for assessing cumulative and combined effects and, in relation to cumulative effects, the extent to which the effects of other developments can be assessed quantitatively depends on the level of information available about the other developments. Such effects are, therefore, assessed by professional judgement, although matrices and modelling are used where appropriate and where enough information regarding the other developments exists. Where environmental assessment information regarding other developments is not available or uncertain, the assessment is necessarily qualitative.

17.3.2 The other developments considered in this Chapter are either:

- approved projects (not yet constructed or operational); or

- projects not yet approved where it is considered likely that they will be approved prior to the submission of this ES (for completeness).
- 17.3.3 Section 8.2 of the Scoping Report submitted to North East Lincolnshire Council (NELC) in July 2018 defines cumulative and combined effects as follows:
- **Cumulative effects** are those that accrue over time and space from a number of development activities. The impact of the Proposed Development will be considered in conjunction with the potential impacts from other projects or activities which are both reasonably foreseeable in terms of delivery (i.e. have planning consent) and are located within a realistic geographical scope where environmental impacts could act together to create a more significant overall effect.
 - **Combined effects** are those resulting from a single development, 'the Proposed Development', on any one receptor that may collectively cause a greater effect (such as the combined effects of noise and air quality/ dust impacts during construction on local residents).
- 17.3.4 This assessment aims to identify the potential for cumulative and combined effects expected to occur during the construction and operation of the Proposed Development and where possible, identify the possibility of significant effects. In determining the possible significance of such cumulative effects, the location and timing of the identified developments and their associated impacts/ effects have been taken into account wherever possible. Cumulative effects during decommissioning of the Proposed Development are not considered as there is no defined time at which decommissioning will take place and therefore no certainty of temporal overlap with other identified committed developments.
- 17.3.5 This Chapter only considers those receptors that would experience any residual effect associated with the Proposed Development. For receptors where the Proposed Development's residual effects are deemed to be neutral/ negligible as reported in this ES, it is considered that such receptors could not experience cumulative effects given that impacts resulting from the Proposed Development would be negligible/ very low, or the receptor would be of negligible/ very low sensitivity to result in such an effect.
- 17.3.6 A long list of developments in the vicinity of the Proposed Development was identified following a search of the relevant planning databases (NELC and North Lincolnshire Council (NLC)). From this long list a refined short list of schemes was prepared that were considered to be of relevance to the cumulative assessment given the nature of the Proposed Development and the potential effects.
- 17.3.7 Following information gathering from available sources, the effects of the Proposed Development have been considered by each technical discipline in conjunction with the potential effects from the developments included in the short-list where there is potential that environmental impacts could act together to create an effect that is more (or less) significant overall than the effect of the individual developments alone.
- 17.3.8 In assessing cumulative effects it is important to acknowledge the relative contributions the different developments make to a cumulative effect and to carefully consider whether a cumulative effect could occur at all.

Study Area and Identification of Long List

- 17.3.9 Cumulative effects are generally unlikely to arise unless the other future development sites are in close proximity to the Proposed Development, recognising that actual distance varies with the nature of the potential effect and the nature of the receptor, e.g. cumulative air quality effects could occur for developments a greater distance apart than noise effects. Construction projects are, as a matter of routine, required to employ

regulatory and managerial controls and employ best practice to mitigate construction impacts wherever possible. Nevertheless, consideration has been given to the presence of common pathways from nearby developments to a single receptor, and whether there is potential for impacts of a sufficient magnitude whereby a particular receptor could experience cumulative effects.

- 17.3.10 The study area for the consideration of cumulative and combined effects has been developed taking into account the predicted extent of impacts associated with the Proposed Development, and with the point at which the associated effects become insufficient to contribute in any meaningful way to those of another proposed development.
- 17.3.11 The study area for each environmental assessment topic is defined in the relevant ES technical chapters (Chapters 7 to 16). Information on the likely extent of impacts associated with other developments in the area has also been considered when determining the long and short list of schemes to be considered.
- 17.3.12 An initial screening exercise was undertaken to identify potential major developments within the vicinity of the Proposed Development for consideration within the cumulative impact assessment. This process identified potential major and other developments considered relevant to the assessment within a 15 km radius to create an initial long list for consideration. This initial long list is included as Table 17.1 below.

Consultation

- 17.3.13 NELC has provided comments on the scope of the cumulative assessment through the EIA Scoping process. Separate consultation on the initial long list was also carried out with NELC and NLC. Through this consultation process further developments were identified and have been included within this assessment where appropriate.
- 17.3.14 No response was received from NLC.

Identification of Short List of Other Developments for Assessment

- 17.3.15 The long list was subsequently screened, based on the potential for impact (e.g. cumulative landscape and visual impacts have potential to occur over a greater distance than, for example, cumulative noise or archaeology impacts) and a refined short list was developed for further, more detailed consideration. This selection process is summarised in Table 17.1.
- 17.3.16 The short list of other developments identified for the cumulative effects assessment are presented in Table 17.2 below, with details of their current status and comments regarding likely timescales.
- 17.3.17 Where individual technical disciplines have scoped out developments included on the short list, for the purposes of their cumulative assessment, the reasoning for this is set out in each section of this Chapter.
- 17.3.18 The approved or proposed boundaries and locations of the other developments included on the short list are shown in relation to the Proposed Development boundary on Figure 17.1.

Table 17.1: Long list of developments to be considered for inclusion within the assessment of Cumulative Effects

APPLICATION REFERENCE	NAME OF DEVELOPMENT / DESCRIPTION	SITE ADDRESS	DISTANCE FROM PROPOSED DEVELOPMENT	STATUS (AT TIME OF ASSESSMENT)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
DM/0094/18/FUL	Construction and modifications of a single carriageway highway link with shared cycle & footway from Moody Lane/Woad Lane junction (to the south east) to Hobson Way Roundabout (to the north west) with associated works including drainage works, street lighting, fencing and landscaping.	Stallingborough Link Road, Energy Park Way, Grimsby, North East Lincolnshire	Immediately adjacent (to the south)	Approved with Conditions (September 2018)	Air Quality Assessment, Ecological Assessment, Transport Assessment, Flood Risk Assessment, Visual Impact Assessment, Habitats Regulations Assessment, Tree Report, Lighting Report, Geo-environmental Interpretative Report	Yes due to proximity – immediately adjacent to the Proposed Development Site.
DM/0099/18/FUL	Change of use from arable fields to mitigation area for a quality habitat area for Special Protection Area (SPA) birds with associated works including two water storage lagoons, shallow scrapes and ponds, bunding, a bird hide, footpaths, car parking, cattle and timber fencing, culverts and bridges. Cress Marsh	Land Adj Poplar Farm South Marsh Road Stallingborough North East Lincolnshire	230 m to the west	Approved with Conditions (August 2018) Currently under construction	Heritage Impact Assessment, Geophysical Survey Report, Flood Risk Assessment, Habitats Regulations Assessment,	Yes due to proximity – within 1 km.
DM/0147/16/FUL	Engineering works and use of land for external car parking, internal site access works, boundary works, and other associated works.	Rear Of Paragon House Kiln Lane Stallingborough North East Lincolnshire	410 m to the west	Approved with Conditions (June 2016)	Environmental Statement, Transport Assessment, Flood Risk Assessment, Landscape and Visual Scoping Report, Air Quality Screening Assessment,	Yes due to proximity – within 1 km
DM/0195/17/FUL	Erection of industrial building and adjoined two storey office/control room to create power plant (18MW Energy From Waste) including construction of associated access, hardsurfacing, erection of 55m chimney stack and installation of necessary plant and machinery. Great Coates Renewable Energy Centre	Vireol Plc Energy Park Way Grimsby North East Lincolnshire DN31 2TT	560 m to the south	Approved August 2017 with Conditions	Environmental Statement, Transport Statement, Outline Traffic Management Plan, Transport Assessment, Noise Assessment, Human Health Risk Assessment, Habitat Regulations Assessment, Flood Risk Assessment, Phase 1 Environmental Assessment, Cultural Heritage Desk Based Appraisal, Ecology Report, Landscape and Visual Appraisal, Air Quality Assessment	No – scheme re-submitted with amended details see DM/0329/18/FUL – scheme re-submitted with amended details see DM/0329/18/FUL. The covering letter accompanying application DM/0329/18/FUL states: “ <i>This application is resubmitted in order to incorporate plant design amendments required to develop the most technically and commercially effective project. This design would operate in essentially the same way as set out in the original planning application; the changes would not result in any further significant environmental effects.</i> ”) On this basis DM/0329/18/FUL has been included in the short list.






APPLICATION REFERENCE	NAME OF DEVELOPMENT / DESCRIPTION	SITE ADDRESS	DISTANCE FROM PROPOSED DEVELOPMENT	STATUS (AT TIME OF ASSESSMENT)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
DM/1050/16/FUL	Change of use to allow business (Use Class B1) and/or general industrial (Use Class B2) and/or storage and distribution (Use Class B8) across the site and reconfiguration of car parking.	Worldwide Way Kiln Lane Trading Estate Access Road Stallingborough Grimsby North East Lincolnshire DN41 8DY	1.22 km to the north-west	Approved with Conditions (March 2017) Development completed.	Flood Risk Assessment	No – development now completed and the type of development is highly unlikely to result in significant cumulative effects.
DM/0848/14/FUL	Development of a renewable power facility for the production of electricity using pre-treated fuel feedstocks including tyres and carpets processed on site with ancillary storage, lorry and car provision and widening of existing access off Europa Way.	Plot Q Kiln Lane Industrial Estate Europa Way Stallingborough North East Lincolnshire	1.60 km to the north-west	Approved with Conditions (April 2016)	Ecology and Protected Species Survey, Transport Assessment, Environmental Risk Assessment, Flood Risk Assessment, Drainage Presentation, Supporting Emissions Statement, Permit Application, Emissions Evidence	Yes due to type of development and proximity – within 2 km.
DM/0449/17/FUL	Install 4 CHP boilers internally to include the erection of associated flues.	Selvic Shipping Ltd Netherlands Way Stallingborough Grimsby North East Lincolnshire DN41 8DF	1.79 km to the north-west	Approved with Conditions (August 2017)	Emissions Report, Flood Risk Assessment	Yes due to proximity – within 5 km.
DM/0333/17/FUL	Develop waste tyre to energy pyrolysis plant at disused Immingham Railfreight Terminal. Erect industrial building and installation of various plant and machinery across the site to include the creation of access, hardstanding/parking, boundary fencing and balancing pond.	Immingham Railfreight Terminal Scandinavian Way Stallingborough Grimsby North East	1.80 km to the north-west	Approved with Conditions (December 2017) This is the same site footprint as application DM/0628/18/FUL i.e. only one of these two developments is likely to be implemented.	Landscape and Visual Impact Assessment, Contaminated Land Appraisal, Surface Water Drainage Strategy, Air Quality Assessment, Transport and Traffic Assessment, Flood Risk Assessment, Ecological Appraisal	Yes due to type of development and proximity – within 5 km.
DM/0717/16/FUL	Construction of access road, electricity sub-station and foul water pumping compound, including installation of surface water drainage (swales - as part of initial phase) and service ducts.	Land Adj Kiln Lane Roundabout Kiln Lane Stallingborough North East Lincolnshire	2.05 km to the west	Approved with Conditions (Oct 2016)	Construction Management Plan, Ecology and Protected Species Survey, Flood Risk Assessment	No due to the type of development proposed and the fact that it is already partially completed it is highly unlikely to result in significant cumulative effects.
PA/2018/155	Planning permission to construct 9 lagoons for the storage of surface water associated with the dewatering of cable trenches for the Hornsea Project One Offshore Windfarm Project.	Fields north of Chase Hill Road, fields west of East Field Road and land east and west of Top Road, South Killingholme	4.8 km to the south-west	Approved with Conditions (March 2018)	Flood Risk Assessment, Ecological walkover technical note	No due to distance and that the type of development is highly unlikely to result in significant cumulative effects




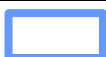

APPLICATION REFERENCE	NAME OF DEVELOPMENT / DESCRIPTION	SITE ADDRESS	DISTANCE FROM PROPOSED DEVELOPMENT	STATUS (AT TIME OF ASSESSMENT)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
DM/0153/17/FUL	Additional area to be added to the temporary site construction compound to support the onshore cable installation and HDD for Hornsea Project One.	Site of Wind Farm Compound Grimsby Road Laceby North East Lincolnshire	6.07 km to the south	Approved with Conditions (May 2017)	None	No due to distance and that the type of development proposed is highly unlikely to result in significant cumulative effects.
PA/2018/918	Planning permission to construct a new gas-fired power station with a gross electrical output of up to 49.9 megawatts VPI Immingham Energy Park A	VPI-Immingham Energy Park A, Rosper Road, South Killingholme DN40 3DZ	6.73 km to the north-west	Approved with Conditions (Sept 2018)	Environmental Statement, Ecology Assessment, Air Quality Assessment, Noise and Vibration Assessment, Landscape and Visual Impact Assessment, Transport Statement, Flood Risk Assessment, Phase 1 Environmental Assessment, Cultural Heritage Assessment, Cumulative and Combined Effects	Yes, although outside of 5 km the type of development proposed has the potential to result in significant cumulative effects.
TWA 8/1/13	A180 Port of Immingham Improvement	South Killingholme	5.93 km to the north-west	Development Consent Granted (Feb 2015) Development completed.	Environmental Statement, Air Quality Assessment, Cultural Heritage Assessment, Landscape and Visual Assessment, Ecology and nature Conservation Assessment, Geology and Soils Assessment, Materials Assessment, Noise and Vibration Assessment, Effects on All Travellers, Community and Private Assets Assessment, Road Drainage and Water Environment Assessment, Cumulative Effects Assessment.	No due to distance and completion of the development.
EN060004	River Humber Gas Pipeline Replacement Project		12.35 km to the north-west	Development Consent Granted		No due to distance.
DM/0329/18/FUL (re-submission of DM/0195/17/FUL)	Erection of industrial building and adjoined two storey office/control room to create power plant (18MW Energy From Waste) including construction of associated access, hardsurfacing, erection of 65m chimney stack and installation of necessary plant and machinery (AMENDED PLANS/DESCRIPTION) Great Coates Renewable Energy Centre	Vireol Plc Energy Park Way Grimsby North East Lincolnshire DN31 2TT	560 m to the south	Application re-submitted and validated May 2018 – Pending Decision	Environmental Statement, Transport Statement, Outline Traffic management Plan, Noise Assessment, Human Health Risk Assessment, Habitat Regulations Assessment, Flood Risk Assessment, Phase 1 Environmental Assessment, Cultural Heritage Desk Based Appraisal, Ecology Report, Landscape and Visual Appraisal	Yes due to type of development and proximity – within 1 km.

APPLICATION REFERENCE	NAME OF DEVELOPMENT / DESCRIPTION	SITE ADDRESS	DISTANCE FROM PROPOSED DEVELOPMENT	STATUS (AT TIME OF ASSESSMENT)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
DM/0628/18/FUL	Partially demolish existing building and erect 20MW _E waste to energy power generation facility and associated plant, machinery, parking and external works	Immingham Railfreight Terminal Scandinavian Way Stallingborough Grimsby North East Lincolnshire DN41 8DT	1.80 km to the north-west	Pending Decision (validated September 2018) This is the same site footprint as application DM/0333/17/FUL i.e. only one of these two developments is likely to be implemented.	Travel Plan, Transport Assessment, Noise Impact Assessment, Landscape and Visual Impact Assessment, Ecology Statement, Cultural Heritage Assessment, Socio-Economics, Major Accidents and Disasters, Flood Risk Drainage and Water, Noise, Human Health, Air Quality and Climate Change, Site Selection and Alternatives	Yes due to type of development proposed and proximity – within 2 km.
DM/0026/18/FUL	Erect an Energy Recovery Facility with an electricity export capacity of up to 49.5MW and associated infrastructure including a stack to 90m high, parking areas, hard and soft landscaping, access road, weighbridge facility and drainage infrastructure.	Land South of Queens Road, Immingham, North East Lincolnshire	c.1.96km to the north-west	Approved with Conditions (October 2018)	Landscape and Visual Impact Assessment, Ecology and Nature Conservation, Noise and Vibration, Air Quality and Human Health, Soils, Geology and Hydrogeology, Surface water and Flood Risk, Socio-Economics, Archaeology and Cultural Heritage.	Yes due to type of development proposed and proximity – within 5 km.
DM/0105/18/FUL	Hybrid application seeking outline consent with access, landscaping and scale to be considered for the development of a 62ha Business Park comprising up to 120,176 sq. m for B1 (Business), B2 (General Industrial) and B8 (Storage and Distribution), associated infrastructure and internal highways. Full application for the creation of a new roundabout, new access roads, associated highway works, substations, pumping stations, drainage and landscaping.	Land Off Stallingborough Interchange Kiln Lane Stallingborough North East Lincolnshire	1.83 km to the west	Approved with Conditions (October 2018)	Transport, Noise and Vibration, Air Quality, Cultural Heritage, Ecology and nature Conservation, Ground Conditions and Contamination, Water Quality, Flood Risk and Drainage, Landscape and Visual, Land Use and Agricultural, Socio-economics, Cumulative	Yes due to type of development and proximity – within 2 km
DM/1146/17/FUL	Additional land for temporary dewatering areas (30m x 30m) including creation of bunding around a lagoon and the installation of a separate settlement tank and pump for Hornsea Project One Offshore Wind Farm (falls within Stallingborough, Laceby, Immingham, Habrough, Healing and Bradley Parishes).	North East Lincolnshire Area Keelby Road Stallingborough North East Lincolnshire	4.76 km to the west (at closest point)	Pending Decision – revised plans submitted September 2018.	Ecological Walkover Survey Report	No, although just within 5 km the type of development proposed is highly unlikely to result in significant cumulative effects and limited environmental information available.



APPLICATION REFERENCE	NAME OF DEVELOPMENT / DESCRIPTION	SITE ADDRESS	DISTANCE FROM PROPOSED DEVELOPMENT	STATUS (AT TIME OF ASSESSMENT)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
PA/SCO/2017/155	Request for Scoping opinion for VPI-Immingham OCGT DCO	Land north of VPI Power Station, Rosper Road, South Killingholme, DN40 3DZ	6.85 km to the north-west	Scoping Opinion Pending Application not yet submitted	Scoping Report	Yes due to type of development.

Table 17.2: Short List of developments to be considered for inclusion within the assessment of Cumulative Effects

DEVELOPMENT REFERENCE (SEE FIGURE 17.1)	APPLICATION REFERENCE	NAME OF DEVELOPMENT / DESCRIPTION	SHORT NAME	DISTANCE FROM PROPOSED DEVELOPMENT	STATUS (AT TIME OF ASSESSMENT)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	DEVELOPMENT TIMESCALES (IF KNOWN)
1 	DM/0094/18/FUL	Construction and modifications of a single carriageway highway link with shared cycle & footway from Moody Lane/Woad Lane junction (to the south east) to Hobson Way Roundabout (to the north west) with associated works including drainage works, street lighting, fencing and landscaping.	Stallingborough Link Road	Immediately adjacent (to the south)	Approved with Conditions (September 2018)	Air Quality Assessment, Ecological Assessment, Transport Assessment, Flood Risk Assessment, Visual Impact Assessment, Habitats Regulations Assessment, Tree Report, Lighting Report, Geo-environmental Interpretative Report	Construction start planned 2018, project complete mid-2020.
2 	DM/0099/18/FUL	Change of use from arable fields to mitigation area for a quality habitat area for Special Protection Area (SPA) birds with associated works including two water storage lagoons, shallow scrapes and ponds, bunding, a bird hide, footpaths, car parking, cattle and timber fencing, culverts and bridges.	Cress Marsh SPA Mitigation Area	230 m to the west	Approved with Conditions Schemes pursuant to pre-commencement conditions approved Sept 2018 (DM/0734/18/CND)	Heritage Impact Assessment, Geophysical Survey Report, Flood Risk Assessment, Habitats Regulations Assessment,	Construction start planned 2018, project complete mid-2019.
3 	DM/0147/16/FUL	Engineering works and use of land for external car parking, internal site access works, boundary works, and other associated works.	Engineering works - Paragon House	410 m to the west	Approved with Conditions (June 2016)	Environmental Statement, Transport Assessment, Flood Risk Assessment, Landscape and Visual Scoping Report, Air Quality Screening Assessment,	Timing details not available - assumed construction to start before June 2019 due to planning condition
4 	DM/0848/14/FUL	Development of a renewable power facility for the production of electricity using pre-treated fuel feedstocks including tyres and carpets processed on site with ancillary storage, lorry and car provision and widening of existing access off Europa Way.	Renewable power facility - Kiln Lane	1.60 km to the north-west	Approved with Conditions (April 2016)	Ecology and Protected Species Survey, Transport Assessment, Environmental Risk Assessment, Flood Risk Assessment, Drainage Presentation, Supporting Emissions Statement, Permit Application, Emissions Evidence	The construction period for the scheme is forecast to be around 12 months.
5 	DM/0449/17/FUL	Install 4 CHP boilers internally to include the erection of associated flues.	Selvic Shipping CHP Boilers	1.79 km to the north-west	Approved with Conditions (August 2017)	Emissions Report, Flood Risk Assessment	Not known.

DEVELOPMENT REFERENCE (SEE FIGURE 17.1)	APPLICATION REFERENCE	NAME OF DEVELOPMENT / DESCRIPTION	SHORT NAME	DISTANCE FROM PROPOSED DEVELOPMENT	STATUS (AT TIME OF ASSESSMENT)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	DEVELOPMENT TIMESCALES (IF KNOWN)
6 	DM/0333/17/FUL	Develop waste tyre to energy pyrolysis plant at disused Immingham Railfreight Terminal. Erect industrial building and installation of various plant and machinery across the site to include the creation of access, hardstanding/parking, boundary fencing and balancing pond.	Waste Tyre Pyrolysis – Immingham Railfreight	1.80 km to the north-west	Approved with Conditions (December 2017) This is the same site footprint as application DM/0628/18/FUL. ¹	Landscape and Visual Impact Assessment, Contaminated Land Appraisal, Surface Water Drainage Strategy, Air Quality Assessment, Transport and Traffic Assessment, Flood Risk Assessment, Ecological Appraisal	Construction not yet started – application DM/0628/18/FUL is for the same site footprint.
7 	PA/2018/918	Planning permission to construct a new gas-fired power station with a gross electrical output of up to 49.9 megawatts	VPI-Immingham Energy Park A	6.73 km to the north-west	Approved with Conditions (September 2018)	Environmental Statement, Ecology Assessment, Air Quality Assessment, Noise and Vibration Assessment, Landscape and Visual Impact Assessment, Transport Statement, Flood Risk Assessment, Phase 1 Environmental Assessment, Cultural Heritage Assessment, Cumulative and Combined Effects	Anticipated construction start early 2019 over 18 months to be completed mid-2020.
8 	DM/0329/18/FUL (re-submission of DM/0333/17/FUL)	Erection of industrial building and adjoined two storey office/control room to create power plant (18MW Energy From Waste) including construction of associated access, hardsurfacing, erection of 65m chimney stack and installation of necessary plant and machinery (AMENDED PLANS/DESCRIPTION)	Great Coates Renewable Energy Centre	560 m to the south	Application re-submitted and validated May 2018 – Pending Decision	Environmental Statement, Transport Statement, Outline Traffic management Plan, Noise Assessment, Human Health Risk Assessment, Habitat Regulations Assessment, Flood Risk Assessment, Phase 1 Environmental Assessment, Cultural Heritage Desk Based Appraisal, Ecology Report, Landscape and Visual Appraisal	The construction period for the scheme is forecast to be around 30 months.
9 	DM/0628/18/FUL	Partially demolish existing building and erect 20MW _E waste to energy power generation facility and associated plant, machinery, parking and external works	Waste to Energy - Immingham Railfreight	1.80 km to the north-west	Pending Decision (validated September 2018) This is the same site footprint as application DM/0333/17/FUL. ¹	Travel Plan, Transport Assessment, Noise Impact Assessment, Landscape and Visual Impact Assessment, Ecology Statement, Cultural Heritage Assessment, Socio-Economics, Major Accidents and Disasters, Flood Risk Drainage and Water, Noise, Human Health, Air Quality and Climate Change, Site Selection and Alternatives	Construction planned 2019 / 2020 and fully operational from 2021 with design life of 20 years.
10 	DM/0026/18/FUL	Erect an Energy Recovery Facility with an electricity export capacity of up to 49.5MW and associated infrastructure including a stack to 90m high, parking areas, hard and soft landscaping, access road, weighbridge facility and drainage infrastructure.	North Beck Energy Centre (NBEC)	c.1.96km to the north-west	Approved with Conditions (October 2018)	Landscape and Visual Impact Assessment, Ecology and Nature Conservation, Noise and Vibration, Air Quality and Human Health, Soils, Geology and Hydrogeology, Surface water and Flood Risk, Socio-Economics, Archaeology and Cultural Heritage.	The construction period for the scheme is forecast to be 39 month. The facility is programmed to open in early 2022.

¹ Approved development reference no. 6 (DM/0333/17/FUL) occupies the same space as pending development reference no. 9 (DM/0628/18/FUL). Whilst the cumulative assessment would conventionally consider only the approved development, construction has not yet begun (to the best of knowledge at the time of undertaking this assessment) and as they occupy the same site both developments cannot be progressed (should DM/0628/18/FUL be approved). Therefore the approach adopted in relation to this site is to assess the development that represents the potential worst case scenario in terms of cumulative effects for each technical discipline.

DEVELOPMENT REFERENCE (SEE FIGURE 17.1)	APPLICATION REFERENCE	NAME OF DEVELOPMENT / DESCRIPTION	SHORT NAME	DISTANCE FROM PROPOSED DEVELOPMENT	STATUS (AT TIME OF ASSESSMENT)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	DEVELOPMENT TIMESCALES (IF KNOWN)
11 	DM/0105/18/FUL	Hybrid application seeking outline consent with access, landscaping and scale to be considered for the development of a 62ha Business Park comprising up to 120,176 sq. m for B1 (Business), B2 (General Industrial) and B8 (Storage and Distribution), associated infrastructure and internal highways. Full application for the creation of a new roundabout, new access roads, associated highway works, substations, pumping stations, drainage and landscaping.	Stallingborough Interchange – Business Park	1.83 km to the west	Approved with Conditions (October 2018)	Transport, Noise and Vibration, Air Quality, Cultural Heritage, Ecology and nature Conservation, Ground Conditions and Contamination, Water Quality, Flood Risk and Drainage, Landscape and Visual, Land Use and Agricultural, Socio-economics, Cumulative	Phase 1A (26,353 m ²) 2018 – 2022 Phase 1B (43,103 m ²) 2020 – 2024 Phase 2 (50,720 m ²) 2023 – 2032
12 	PA/SCO/2017/155	Request for Scoping opinion for VPI-Immingham OCGT DCO	VPI-Immingham OCGT DCO	6.85 km to the north-west	Scoping Opinion Pending Application not yet submitted	Scoping Report	3 year construction programme, earliest operation in 2023.

17.4 Electrical and Gas Connection Works

- 17.4.1 Chapter 4 of the ES provides a description of the Proposed Development and includes a brief description of the electrical and gas connections that will be required.
- 17.4.2 On site electrical connection works and gas connection works have been assessed as part of the EIA. However, any electrical connection works outside of Planning Application boundary, whilst required for the development, do not form part of the Planning Application and the relevant undertaker will rely either on their statutory powers or obtain the relevant consents prior to connection. Similarly, if a connection to an off-site gas distribution network were required, this would also require a separate consent. Any potential off-site works for these connections have therefore not been assessed in the EIA.
- 17.4.3 It is considered that consent would only be granted for these works once the relevant authority was satisfied that the works could be undertaken, in their own right, without the potential for any significant effect either in isolation or with regards to any other development being undertaken at that time. This would be demonstrated either through the planned implementation of best practice measures or by securing a commitment to any further mitigation measures deemed necessary by the consenting authority at that time.
- 17.4.4 On the basis of the above and taking into consideration the relatively minor nature of these works it is considered that there is no potential for any significant cumulative effects with the construction or the operation of the Proposed Development or the implementation of the developments included in Table 17.2.
- 17.4.5 The off Site electrical connection works and gas connection works are therefore not considered further in this Chapter.

17.5 Air Quality

- 17.5.1 Table 17.3 below summarises how each of the developments included in the short list (Table 17.2) have been considered with regards to potential cumulative effects.

Table 17.3: Scope of Air Quality Cumulative Assessment

DEVELOPMENT REFERENCE	ADMS 5 DISPERSION MODELLING	ADMS ROADS MODELLING ASSESSMENT
1. Stallingborough Link Road	Scoped out Unquantifiable and likely minimal source emissions as a result of this development.	Scoped in Traffic data included in the 2022 Base + Committed and 2022 Base + Committed +Operation scenarios
2. Cress Marsh SPA Mitigation Area	Scoped out Unquantifiable and likely minimal source emissions as a result of this development and is expected to be largely completed in advance of commencement of construction of the Proposed Development.	Scoped out

DEVELOPMENT REFERENCE	ADMS 5 DISPERSION MODELLING	ADMS ROADS MODELLING ASSESSMENT
3. Engineering works – Paragon House	Scoped out Minimal point source emissions.	Scoped in Traffic data included in the 2022 Base + Committed and 2022 Base + Committed +Operation scenarios
4. Renewable power facility – Kiln Lane	Scoped out The information provided in the planning application is inconsistent with data that can be replicated by dispersion modelling software	Scoped in Traffic data included in the 2022 Base + Committed and 2022 Base + Committed +Operation scenarios
5. Selvic Shipping CHP Boilers	Scoped out The information provided in the planning application is inadequate to undertake dispersion modelling.	Scoped out
6. Waste Tyre Pyrolysis – Immingham Railfreight	Scoped in	Scoped in Traffic data included in the 2022 Base + Committed and 2022 Base + Committed +Operation scenarios
7. VPI Immingham Energy Park A	Scoped in	Scoped out Traffic for this development is unlikely to affect the transport study area for the Proposed Development.
8. Great Coates Renewable Energy Centre	Scoped in	Scoped out Traffic for this development is unlikely to affect the transport study area for the Proposed Development.
9. Waste to Energy Immingham Railfreight	Scoped out This development occupies the same space as Development Ref: 6 and it is not possible for both developments to occur. Development Ref: 6 is included in the assessment on the basis that it represents the worst case scenario in terms of emissions.	Scoped out This development occupies the same space as Development Ref: 6 and it is not possible for both developments to occur. Development Ref: 6 is included in the assessment on the basis that it represents the worst case scenario in terms of traffic (see section 17.7).

DEVELOPMENT REFERENCE	ADMS 5 DISPERSION MODELLING	ADMS ROADS MODELLING ASSESSMENT
10. North Beck Energy Centre	Scoped in	Scoped in Traffic data included in the 2022 Base + Committed and 2022 Base + Committed +Operation scenarios
11. Stallingborough Interchange – Business Park	Scoped out The information provided in the planning application is inadequate to undertake dispersion modelling.	Scoped in Traffic data included in the 2022 Base + Committed and 2022 Base + Committed +Operation scenarios
12. VPI Immingham OCGT DCO	Scoped out Insufficient information available to inform an assessment of cumulative effects	Scoped out Insufficient information available to inform an assessment of cumulative effects

Construction Cumulative Effects – Human Receptors

Dust

- 17.5.2 The Air Quality assessment (see Chapter 7) concludes that, with appropriate mitigation in place, the dust and particulates arising as a result of activities undertaken during the construction phase would be likely to result in negligible effects at all of the identified human receptors and that the effect will not therefore be significant. On this basis there is no potential for a significant cumulative effect on receptors outside of the Site as a result of dust and particulates.

Construction Traffic

- 17.5.3 The magnitude of the change in pollutant concentrations due to construction traffic on the road network due to the Proposed Development is predicted to be imperceptible or very low for all pollutants at all receptor locations. A change of this magnitude is considered to have a negligible effect, which is considered to be not significant. On this basis there is no potential for a significant cumulative effect as a result of construction traffic.

Construction Cumulative Effects – Ecological Receptors

- 17.5.4 The Humber Estuary SPA/ SAC/ Ramsar site is over the screening distance of 50 m from the construction works; therefore an assessment of construction dust impacts on ecological receptors has not been undertaken and it is predicted that there will be no significant effect on this receptor. On this basis there is no potential for a significant cumulative effect on this receptor as a result of construction dust.

Operational Cumulative Effects - Human Receptors

Odour

- 17.5.5 The Air Quality assessment (see Chapter 7) concludes that fugitive odour emissions from the Proposed Development would be likely to result in very low or low impacts at all locations outside of the Site, producing effects of negligible significance. On this

basis there is no potential for a significant cumulative effect on human receptors outside of the Site as a result of odour.

Proposed Development Stacks and Operational Road Traffic

- 17.5.6 The advanced dispersion modelling ADMS 5 modelled the potential cumulative effects from the Proposed Development alongside the operation of the developments as identified in Table 17.3 above. The technical findings of the modelling can be found in Annex D of Appendix 7A in ES Volume III.
- 17.5.7 Annual mean nitrogen dioxide concentrations at all of the identified sensitive human receptor locations remain below the air quality standard. R8 (located just north of the A180) and R21 located within Grimsby AQMA are predicted to experience a minor adverse effect in terms of the change in nitrogen dioxide concentrations due to the emissions from the other modelled developments.
- 17.5.8 Annual mean particulate matter and fine particulate matter concentrations at all of the identified sensitive human receptor locations remain below the air quality standard. All sensitive human receptor locations are predicted to experience a negligible change in particulate matter concentrations due to the emissions from the other identified developments.
- 17.5.9 The maximum cumulative process contribution within the modelled domain for sulphur dioxide, carbon monoxide, hydrogen chloride, hydrogen fluoride, lead, mercury, antimony, cadmium, chromium, copper, manganese and vanadium remain below their representative environmental standards at all identified sensitive human receptor locations. Dioxins and furans remain well below the background pollutant concentrations.
- 17.5.10 Arsenic, chromium (VI), nickel and Polycyclic Aromatic Hydrocarbons (PAH) as benzo[a]pyrene required more specific modelling due to their contribution from each assessed development being greater than one percent of the environmental standard. Modelling undertaken using emission concentrations from similar energy from waste plants identified in the short list resulted in the total concentrations remaining small and insignificant. The maximum concentrations of chromium (VI), arsenic and nickel are located in the Humber Estuary far from the identified sensitive human receptor locations. The maximum concentrations of Polycyclic Aromatic Hydrocarbons (PAH) as benzo[a]pyrene are located adjacent to the Development Ref: 3 and Development Ref: 10 so cannot be attributed to the Proposed Development; the Proposed Development contribution at these locations represents 0.003% of the air quality standard, which can be screened as insignificant.
- 17.5.11 On the basis of the information available, the cumulative air quality assessment has not identified any significant cumulative air quality effects on human receptors as a result of the Proposed Development and the other developments identified and assessed.

Operational Cumulative Effects - Ecological Receptors

- 17.5.12 The modelling results show that the predicted impacts are within the criteria for insignificance at most of the selected receptors. A Process Contribution (PC) of more than 1% of the long term critical load has been predicted to occur at receptor E4, within the Humber Estuary SAC (Acid Fixed Dunes), in respect of acid deposition, in an area which already exceeds the relevant standard.
- 17.5.13 At the acid fixed dunes, the cumulative PC to acid deposition is 1.5% of the lower range critical load. The PC from the SHBEC alone was 0.6% of the lower range critical load.

17.5.14 The significance of the potential cumulative air quality effects on sensitive ecological receptors is discussed in Section 17.8 below.

17.6 Noise and Vibration

17.6.1 The developments that have been scoped into the cumulative noise and vibration assessment are:

- Stallingborough Link Road (Development Ref: 1)
- Cress Marsh SPA Mitigation Area (Development Ref: 2)
- Engineering works – Paragon House (Development Ref: 3)
- Great Coates Renewable Energy Centre (Development Ref:8)
- North Beck Energy Centre (Development Ref: 10)
- Stallingborough Interchange - Business Park (Development Ref: 11)

17.6.2 The other developments included on the short list (Table 17.2) have been scoped out of the noise and vibration cumulative assessment due to the distances from the Proposed Development Site and from the identified nearest sensitive receptors (NSRs) and/or limited availability of information. Cumulative impacts have been considered at different receptor locations should individual developments be constructed and/ or operated at the same time as the Proposed Development. An assessment has also been undertaken of the potential for significant cumulative effects on the NSRs identified for the Proposed Development as a result of all of the aforementioned developments collectively being progressed in parallel with the Proposed Development.

Stallingborough Link Road (Development Ref: 1)

17.6.3 The noise assessment undertaken for the Stallingborough Link Road considers receptors within a series of defined Study Areas. The receptors assessed include residential dwellings at Woad Lane (to the south of the A180 on the edge of Grimsby) and on identified Greenfield areas 2 km from the high tide of the Humber Estuary and the Humber Estuary SPA. The assessment considers two comparison scenarios; without the development against the project in 2016 and without the project in 2016 against with the project in 2026.

17.6.4 The assessment predicts a negligible magnitude of impact at all of the residential receptors on Woad Lane except one where there is predicted to be no change as a result of the project.

17.6.5 The assessment predicts that the noise impact on dwellings outside of the specified Study Areas is likely to be negligible and predicts that the noise impact of the project on both the Humber Estuary SPA and the Greenfield areas is negligible. Overall it is predicted that the noise effect on all receptors will not be significant.

17.6.6 The noise assessment undertaken for the Stallingborough Link Road predicts that noise levels ($L_{A10,18hr}$) in the short term or long term may increase by more than 1 dB or 3 dB because of the construction of a new link road – presumably within the defined Study Areas.

17.6.7 The NSRs identified for the Proposed Development, as detailed at Chapter 8 of this ES, fall outside of the Study Area for the Stallingborough Link Road. The NSR to the Proposed Development that is closest to the Study Area for the Stallingborough Link Road is R2.

17.6.8 On the basis that the noise assessment undertaken for the Proposed Development predicts that the magnitude of impact (for both construction and operational noise) will

be negligible at this location (R2) and therefore the effect will be negligible adverse (not significant), it is considered that the construction and operation of the Proposed Development at the same time as the construction or use of the new Link Road would not result in a significant cumulative noise effect.

Cress Marsh SPA Mitigation (Development Ref: 2)

- 17.6.9 The application for the SPA Mitigation did not include a noise assessment. On the basis of the description of the development it is considered that there would only be the potential for noise impacts during the construction phase, no operation noise impacts are anticipated.
- 17.6.10 The Construction Management Plan submitted pursuant to Condition 7 to the SPA Mitigation Area planning permission details the best practice measures that will be adopted for noise control on-site during construction.
- 17.6.11 On the basis that the submissions made to NELC pursuant to the pre-commencement conditions attached to the planning permission for the SPA Mitigation Area have been approved by NELC (DM/0734/18/CND) subject to implementation of the approved details, it is considered highly unlikely that there will be any overlap between the construction phase of the SPA Mitigation Area and the construction phase of the Proposed Development.
- 17.6.12 Notwithstanding this, the noise assessment included at Chapter 8 of this ES predicts that construction noise effects at R1 (Poplar Farm) and R2 (Cress Cottage), both of which are in close proximity to the SPA Mitigation Area, would be negligible.
- 17.6.13 There is therefore no potential for significant cumulative noise effects.

Engineering works - Paragon House (Development Ref: 3)

- 17.6.14 A noise assessment was not undertaken in relation to the construction or use of the additional car parking areas at Paragon House. The ecological impact assessment undertaken considers the indirect effect of noise and vibration (at both the construction and operational phases) on designated and non-designated ecological features and on specific species. The residual effects of the proposed works on ecological receptors are considered to be not significant.
- 17.6.15 Condition 9 of permission DM/0147/16/FUL requires the submission of a Construction Management Plan (including noise mitigation measures) prior to the development commencing. There are no subsequent submissions pursuant to the planning conditions for this development available on the NELC planning webpage.
- 17.6.16 On the basis that a noise impact assessment was not required in support of this application and that the ecological assessment considered the effects of noise and vibration on ecological features in the vicinity of the site to be negligible, it is considered reasonable to conclude that the potential for significant cumulative noise effects is highly unlikely.

Road Traffic

- 17.6.17 The Transport Assessment undertaken in relation to the construction and use of the works assesses the impact of road traffic noise as a result of the works, namely the change in road noise as a result in increases in traffic volumes. The assessment predicts that the works and use of the site will result in a predicted increase in road traffic noise at North Marsh Lane of 0.0 dB(A) and on the A1173 of 0.2 dB(A).

17.6.18 The increase in road traffic flows as a result of the operation of the Proposed Development has been predicted to increase $L_{A10,18hr}$ noise levels by 0.2 dB at Poplar Farm and 0.3 dB at Mauxhall Farm (to the north of the A1173).

17.6.19 Cumulative noise levels from changes in road traffic flows from the operation of both developments are therefore likely to result in an increase of up to 0.5 dB which is assessed as a negligible impact, resulting in a negligible adverse (not significant) effect.

Great Coates Renewable Energy Centre (Development Ref: 8)

Construction Noise

17.6.20 The noise assessment undertaken for the Great Coates Renewable Energy Centre (GCREC) includes a receptor in common with the noise assessment included at Chapter 8 of this ES; R1 (Poplar Farm)

17.6.21 The highest construction noise level predicted at Poplar Farm as a result of the GCREC is 41 dB, which is assessed as not significant. The highest predicted noise level from the construction of the Proposed Development at Poplar Farm is 48 dB, resulting in a cumulative construction noise level of 49 dB L_{Aeq} . This is 5 dB below the measured ambient noise level resulting in an assessment of no significant cumulative operational effect should the construction of the GCREC and the Proposed Development coincide.

Construction Vibration

17.6.22 A construction vibration assessment was not undertaken for the GCREC. Condition 9 of permission DM/0195/17/FUL requires the submission of a detailed specification of the type of piling or foundations to be used and a scheme to mitigate effects of piling with regard to noise and vibration.

17.6.23 The construction vibration assessment included at Chapter 8 of this ES predicts that construction vibration levels for the Proposed Development will not result in any significant vibration at the residential NSRs. Predicted effects as a result of construction vibration at the ecological NSR (Humber Estuary) and the fields to the north and south of the Site are assessed as being of minor significance provided that mitigation is applied, either by seasonally restricting drop hammer piling or using alternative piling techniques.

Operational Noise

17.6.24 With regards to the operation of the GCREC, the noise assessment undertaken predicts operational noise to be 29 dB $L_{Aeq}(t)$ at Poplar Farm. The highest predicted noise level from the operation of the Proposed Development at R1 (Poplar Farm) is 35 dB, resulting in a cumulative operational noise level of 36 dB L_{Aeq} . The lowest typical background noise level at Poplar Farm during the day is 48 dB L_{A90} . With a +3 dB penalty for intermittency, the cumulative rating level from the operation of the GCREC and the operation of the Proposed Development would fall below the measured background noise level resulting in an assessment of no significant cumulative operational effect.

Road Traffic

17.6.25 Changes in road traffic noise in relation to the construction and operation of the GCREC were not assessed in the submitted ES (either in the Noise Assessment or the Transport Assessment).

North Beck Energy Centre (Development Ref: 10)*Construction Noise*

- 17.6.26 The construction noise assessment undertaken for the proposed North Beck Energy Centre (NBEC) predicts that construction noise levels at all of the NSRs to the NBEC will result in a negligible impact, with a neutral significance of effect. As all of the NSRs to the Proposed Development are located further away from the NBEC than the NBEC NSRs, noise impacts upon the NSRs to the Proposed Development as a result of the construction of the proposed NBEC will also be negligible.
- 17.6.27 The construction noise assessment included at Chapter 8 of this ES predicts that construction noise levels for the Proposed Development will result in no significant effect at the residential NSRs to the Proposed Development, with a neutral significance of effect.
- 17.6.28 During drop hammer piling works, the impact of increased noise levels at the field to the south of the Site) is assessed as moderate adverse, however mitigation is proposed to reduce this effect to minor adverse as outlined above. In addition, due to the distance from the NBEC site to this field, no significant cumulative effect is anticipated.
- 17.6.29 On the basis of the above, should the construction phases of the proposed NBEC and the Proposed Development overlap then no significant cumulative construction noise effects are predicted.

Construction Vibration

- 17.6.30 The construction vibration assessment undertaken for the proposed NBEC predicts that the levels of vibration are likely to result in an impact magnitude of negligible, with a neutral significance of effect at all NSRs to the proposed NBEC.
- 17.6.31 The construction vibration assessment included at Chapter 8 of this ES predicts that construction vibration levels for the Proposed Development will not result in any significant vibration at the residential NSRs. Predicted effects as a result of construction vibration at the ecological NSR (Humber Estuary) are assessed as being of minor significance, while effects on the fields to the north and south of the Site are predicted to be minor adverse during piling works provided the outlined mitigation is applied.
- 17.6.32 On the basis of the above, should the construction phases of the proposed NBEC and the Proposed Development overlap then no significant cumulative construction vibration effects are predicted.

Operational Noise

- 17.6.33 The operational noise assessment undertaken for the proposed NBEC includes an assessment of daytime and night time. The NBEC operational daytime noise assessment predicts a negligible impact at all of the NSRs to the proposed NBEC, with a neutral significance of effect. The NBEC operational night time noise assessment predicts a negligible impact all of the NSRs to the proposed NBEC, with a neutral significance of effect.
- 17.6.34 The operational noise assessment included at Chapter 8 of this ES considers three scenarios:
- Scenario 1: Worst-case hour during the day (0900 - 1000)
 - Scenario 2: Worst-case hour at night including HGVs (0600 – 0700); and
 - Scenario 3: Typical one-hour at night – no HGVs (2300 – 0600)

- 17.6.35 The assessment predicts that operational noise levels for the Proposed Development in all three scenarios will result in a negligible impact with a negligible significance of effect at the residential NSRs. Predicted effects as a result of operational noise at the ecological NSRs (including the Humber Estuary) are also assessed as being of minor adverse or negligible significance.
- 17.6.36 On the basis of the above, it is predicted that the operation of the proposed NBEC and the Proposed Development would not result in a significant cumulative noise effect.

Operational Road Traffic

- 17.6.37 With regards to operational traffic along the A1173, an increase in road traffic noise levels of +0.1 dB $L_{A10,18h}$ is predicted as a result of the operation of the proposed NBEC. The increase in road traffic flows as a result of the operation of the Proposed Development has been predicted to increase $L_{A10,18hr}$ noise levels by 0.3 dB at Mauxhall Farm (to the north of the A1173).
- 17.6.38 Cumulative noise levels from changes in road traffic flows from the operation of both developments are therefore likely to result in an increase of up to 0.5 dB which is assessed as a negligible impact, with a negligible significance of effect.

Stallingborough Interchange – Business Park (Development Ref: 11)

Construction Noise

- 17.6.39 The NSR to the proposed Business Park that is closest to one of the NSRs to the Proposed Development (R1 at Poplar Farm) is Location B (a residential receptor on North Moss Lane). These two locations are within 300 m of each other.
- 17.6.40 The noise assessment undertaken for the proposed Business Park predicts construction noise levels at North Moss Lane in the region of 49 dB L_{Aeq} . The highest predicted noise level from the construction of the Proposed Development at R1 (Poplar Farm) is 48 dB, resulting in a cumulative construction noise level of 52 dB L_{Aeq} . This is 2 dB below the measured ambient noise level.
- 17.6.41 It is therefore considered that the construction of the proposed Business Park at the same time as the construction of the Proposed Development would not result in a significant cumulative noise effect.

Construction Road Traffic

- 17.6.42 The noise assessment undertaken for the proposed Business Park does not include a quantitative assessment of construction road traffic noise due to the lack of available data. The assessment predicts that the impact of construction traffic would be negligible when compared to the traffic volumes on the surrounding network and concludes that there will be no significant effect at dwellings.

Construction Vibration

- 17.6.43 The construction vibration assessment undertaken for the proposed Business Park concludes that because the distance between the proposed Business Park and all of the NSRs is greater than 100 m, the level of vibration is predicted to be well below levels at which there is a risk of causing damage to buildings or disturbance to residents.
- 17.6.44 On the basis of the above, and the predicted construction vibration impacts of the Proposed Development as previously outlined, even if the construction phases of the proposed Business Park and the Proposed Development overlap, no significant cumulative construction vibration effects are predicted.

Operational Noise

- 17.6.45 The noise assessment undertaken for the proposed Business Park does not provide a quantitative assessment of operation / use noise from the units proposed as at the time of writing specific operators / tenants of the units were not known. NELC would require individual operators to submit noise assessments to ensure operating levels do not exceed established criteria.
- 17.6.46 With regards to the operation of the business park, noise from on-site HGV movements and idling HGV refrigeration units is predicted to be in the region of 43 dB L_{Aeq} at Location B (North Moss Lane). The highest predicted noise level from the operation of the Proposed Development at R1 (Poplar Farm) is 34 dB, resulting in a cumulative operational noise level of 44 dB L_{Aeq} . The lowest typical background noise level at Poplar Farm during the day is 48 dB L_{A90} . With a +3 dB penalty for intermittency, the cumulative rating level from on-site HGV movements and idle HGV refrigeration units at the proposed Business Park and the operation of the Proposed Development would fall below the measured background noise level resulting in an assessment of no significant cumulative operational effect.

Operational Road Traffic

- 17.6.47 The noise assessment undertaken for the proposed Business Park predicts that the proposed development will result in a negligible increase in road traffic noise levels within the local area and therefore no significant effects have been identified.
- 17.6.48 With regards to operational traffic along the A1173, an increase in road traffic noise levels of +0.1 dB $L_{A10,18h}$ is predicted as a result of the operation of the proposed Business Park. The increase in road traffic flows as a result of the operation of the Proposed Development has been predicted to increase $L_{A10,18hr}$ noise levels by 0.3 dB at Mauxhall Farm (to the north of the A1173).
- 17.6.49 Cumulative noise levels from changes in road traffic flows from the operation of both developments are therefore likely to result in an increase of up to 0.5 dB which is assessed as a negligible impact, with a negligible significance of effect.
- 17.6.50 On the basis of the information available, the cumulative noise assessment does not identify any significant cumulative noise effects as a result of the Proposed Development and the other individual developments identified and assessed.
- 17.6.51 A qualitative assessment has been undertaken of the potential for significant cumulative effects on the NSRs identified for the Proposed Development as a result of all of the aforementioned developments collectively being progressed in parallel with the Proposed Development, the findings of which are summarised as follows:
- the construction noise assessment (see Chapter 8) concludes that the Proposed Development will have a negligible effect on surrounding residential receptors. Consequently, there will be no significant cumulative noise effects resulting from site construction.
 - the construction noise assessment (see Chapter 8 and Chapter 10 Ecology and Nature Conservation) concludes that there will be minor (i.e. not significant) effects on surrounding ecological receptors (Humber Estuary and fields immediately to the north and south of the Site) as a result of the Proposed Development. Given the distance between the other developments in the cumulative assessment and the ecological receptors, there will be no significant cumulative noise effects resulting from site construction.

- the construction traffic noise assessment concludes that there will be negligible effects on surrounding receptors as a result of the Proposed Development. Consequently, there will be no significant cumulative noise effects resulting from construction traffic on public roads;
- the construction vibration assessment concludes that there will be negligible effects on surrounding residential receptors as a result of the Proposed Development. Consequently, there will be no significant cumulative vibration effects resulting from site construction;
- the construction vibration assessment concludes that there will be minor (i.e. not significant) effects on surrounding ecological receptors (Humber Estuary and fields immediately to the north and south of the Site) as a result of the Proposed Development. Given the distance between the other developments in the cumulative assessment and the ecological receptors, there will be no significant cumulative vibration effects resulting from site construction;
- the operational noise assessment (see Chapter 8) concludes that there will be negligible effects on surrounding residential receptors as a result of the Proposed Development. Consequently, there will be no significant cumulative noise effects resulting from site operation;
- the operational noise assessment concludes that there will be negligible effects on surrounding ecological receptors (Humber Estuary and fields immediately to the north and south of the Site) as a result of the Proposed Development. Given the distance between the other developments in the cumulative assessment and the ecological receptors, there will be no significant cumulative noise effects resulting from site operation;
- the operational traffic noise assessment concludes that there will be negligible effects on surrounding receptors as a result of the Proposed Development. Consequently, there will be no significant cumulative noise effects resulting from operational traffic on public roads; and
- the operational vibration assessment concludes that there will be negligible effects on surrounding receptors as a result of the Proposed Development. Consequently, there will be no significant cumulative vibration effects resulting from site operation.

Cumulative Assessment Summary

17.6.52 On the basis of the information available, the cumulative noise assessment does not identify any significant cumulative noise effects as a result of the Proposed Development and the other developments identified and assessed – both individually and collectively.

17.7 Traffic and Transport

17.7.1 The Transport Assessment (TA) undertaken and reported in Chapter 9 of this ES incorporates other development (defined as Committed Development) into the assessment scenario for the future year analysis and as such the assessment presented in Chapter 9 is inherently a cumulative impact assessment.

17.7.2 The TA future year analysis includes project specific traffic data from the following developments (based on available information at the time of assessment):

- Engineering works – Paragon House (Development Ref: 3)
- Renewable Power Facility – Kiln Lane (Development Ref 4:

- Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref: 6)
 - North Beck Energy Centre (Development Ref: 10)
 - Stallingborough Interchange - Business Park (Development Ref: 11)
- 17.7.3 The TA takes into account the opening of the Stallingborough Link Road (Development Ref 1) in 2022 and the associated re-distribution of traffic by undertaking sensitivity testing at key junctions within the study area (see Section 10 of Chapter 9).
- 17.7.4 As noted earlier in this Chapter, Development Ref: 6 (Waste Tyre Pyrolysis) and Development Ref: 9 (Waste to Energy - Immingham Railfreight) are proposed to occupy the same area (red line boundaries are around the same site). The approach adopted for the TA was therefore to ascertain which of the developments represents the worst case scenario in terms of trip generation and include that development in the assessment. The Transport Statement submitted in support of Development Ref: 6 as compared to the TA submitted in support of Development Ref: 9, shows that Development Ref: 6 would generate slightly more traffic in the AM and PM Peak hours and is therefore included in the assessment.
- 17.7.5 The TA future year analysis incorporates the following developments within the background growth applied to the 2018 baseline flows:
- Cress Marsh SPA Mitigation (Development Ref: 2)
 - Selvic Shipping CHP Boilers (Development Ref: 5)
 - Great Coates Renewable Energy Centre (Development Ref: 8)
 - VPI Immingham Energy Park A (Development Ref 7)
 - VPI Immingham OCGT DCO (Development Ref: 12)
- 17.7.6 The Committed Development incorporated into the future year analysis in the TA also includes some of the developments identified in the Long List (see Table 17.1) as these developments have been specifically identified as contributing to future traffic flows in the area.
- Hornsea Project One – additional area (DM/0153/17/FUL)
 - Change of Use – Worldwide Way (DM/1050/16/FUL)
 - Construction of access road – Land Adj Kiln Lane (DM/0717/16/FUL)
 - Additional temporary construction area – Site of Wind Farm Compound (DM0153/17/FUL)
 - Construction of 9 Lagoons - South Killingholme (PA/2018/155)
 - River Humber Gas Pipeline Replacement Project (EN060004)
 - A180 Port of Immingham Improvement (TWA 8/1/13)
- 17.7.7 Section 11 of Chapter 9 concludes that, having taken into account the identified Committed Developments as part of the future year analysis; it is not considered that the Proposed Development will have a material impact in terms of highway capacity or safety and that the proposals represent acceptable development in highways and transport terms. There is therefore no potential for significant cumulative traffic effects.

Cumulative Assessment Summary

- 17.7.8 On the basis of the information available, the cumulative transport assessment does not identify any significant cumulative traffic effects as a result of the Proposed Development and the other developments identified and assessed.

17.8 Ecology

Construction

Losses of Functionally Linked Habitat

- 17.8.1 There is the potential for cumulative effects on waterbirds using functionally linked habitat surrounding the Estuary in the absence of mitigation, should multiple schemes proceed that result in the loss of such habitat. Only one of the schemes considered on the cumulative effects shortlist was identified as potentially combining with the Proposed Development to result in a cumulative adverse effect through this pathway; this is the Stallingborough Link Road (Development Ref: 1), which will result in the loss of functionally linked habitat to the south of the Proposed Development.
- 17.8.2 The applicant for the Stallingborough Link Road scheme, North East Lincolnshire Council, (NELC), has committed to committing a sum of money via NELC Local Plan Policy 9 to the South Humber Gateway strategic mitigation scheme, which will draw down 6.3 ha of mitigation habitat. With mitigation, there will therefore be no cumulative adverse effects on the Humber Estuary SPA/ Ramsar with the Proposed Development, as a result of the loss of functionally linked habitat.

Noise and Vibration Disturbance to Functionally Linked Habitats

- 17.8.3 The cumulative noise and vibration assessment (see section 17.6) concludes that the construction of the Proposed Development at the same time as the construction or use of the new Link Road would not result in a significant cumulative noise effect. As described above NELC has committed to committing a sum of money to enable mitigation habitat to be created. With this mitigation, and taking into account the Applicant's proposed contribution to the South Humber Gateway strategic mitigation scheme (see Chapter 10), there is therefore no potential for cumulative adverse effects the Humber Estuary SPA/ Ramsar as a result of construction disturbance to functionally linked habitat.

Operation

Changes in Air Quality

- 17.8.4 Potentially significant cumulative effects on the Humber Estuary designated sites may occur where the cumulative PC exceeds the 1% screening threshold of the critical level (rounded up or down to the nearest whole number) and the Predicted Environmental Concentration (PEC) exceeds the relevant critical level/ load. Unless both these criteria are exceeded, no likely significant effects on habitats within the designated sites would be predicted either because the relevant assessment threshold would not be breached, or because the other plans/ projects scoped into the cumulative effects assessment would collectively make an imperceptible contribution to emissions/ deposition.

Cumulative Emissions of Nitrogen Oxides (NO_x)

- 17.8.5 The air quality assessment has identified that the cumulative process contribution of NO_x at the nearest saltmarsh habitat to the Proposed Development (receptors E1_1, E1_2 and E1_3 in Chapter 7: Air Quality) is between 6.8 and 7.6%. This therefore exceeds the threshold for insignificance and indicates that further assessment is required.

- 17.8.6 On this basis, the total contribution from all schemes to the habitat (the PEC) has been examined to determine actual deposition rates for the year. The cumulative PEC results in total NO_x of 31.2 – 31.4 µg/m³ at these locations, which also exceeds the critical level for all vegetation types from the effects of NO_x of 30 µg/m³. However, the cumulative PEC will remain below the critical load for saltmarsh; being a maximum of 16.5 kg N/ha/yr compared to a minimum critical load of 20 kg N/ha/yr. This is therefore assessed as a neutral effect on the Humber Estuary SPA/ SAC/ Ramsar/ SSSI with other plans/ projects (not significant).
- 17.8.7 Moreover, it is important to note that the experimental studies that underlie conclusions regarding the sensitivity of saltmarsh to nitrogen deposition, and the selection of 20 kg N/ha/yr as the minimum critical load have “... *neither used very realistic N [nitrogen] doses nor input methods i.e. they have relied on a single large application more representative of agricultural discharge*” (APIS website), which is far in excess of anything that would be deposited from atmosphere. For coastal saltmarshes such as those for which Humber Estuary SAC is partly designated, nitrogen inputs from air are not as important as nitrogen effects from other sources because the effect of any deposition of nitrogen from atmosphere is likely to be dominated by much greater flushes of more readily utilized nitrogen from marine, fluvial or agricultural sources. This is reflected on APIS itself, which states regarding saltmarsh that “*Overall, N deposition [from atmosphere] is likely to be of low importance for these systems as the inputs are probably significantly below the large nutrient loadings from river and tidal inputs*”. In addition, the nature of intertidal saltmarsh in this area means that there is flushing by tidal incursion twice per day. This is likely to further reduce the role of nitrogen from atmosphere in controlling botanical composition.
- 17.8.8 An additional saltmarsh habitat receptor within the designated site (receptor E3_1) slightly exceeds the 1% process contribution threshold (1.2%), although the total PEC results in a cumulative contribution of 37.4 µg/m³. However, as the baseline levels of NO_x at this receptor are already exceeding the critical level (baseline level is 37.2 µg/m³), this small additional contribution is not reasonably considered to result in any adverse effects on the designated site, in combination with other plans/ projects.

Cumulative Nutrient Nitrogen (N) Deposition

- 17.8.9 The air quality impact assessment has concluded that the annual N deposition rate (kg N/Ha/year) process contribution at the nearest saltmarsh habitat would be between 3.7% and 4.1% of the critical load at receptors E1_1, E1_2 and E1_3. As this is above the 1% insignificance screening threshold, it is therefore necessary to examine the output from the modelling in greater detail to establish whether this elevation in N deposition would result in any significant effects on the saltmarsh habitat.
- 17.8.10 The total cumulative annual N deposition predicted at these three receptors is 0.7 – 0.8 kg N/ha/yr, resulting from NO_x and ammonia (NH₃), compared to the background deposition of 15.7 kg N/ha/yr. With the Proposed Development there would therefore be no exceedance of the critical load for this habitat type, which is 20 – 30 kg N/ha/yr. It is therefore assessed that N deposition resulting from the Proposed Development will result in a neutral effect on the Humber Estuary SPA/ SAC/ Ramsar/ SSSI with other plans/ projects.

Cumulative Acid Deposition

- 17.8.11 For acid deposition (keq/Ha/year), the air quality impact assessment identified that at the nearest sensitive receptors (sand dune habitats at E4_1, E4_2, E4_3, E4_4 and E4_5, E4_6) the cumulative process contribution would slightly exceed the 1% insignificance screening threshold for potential adverse effects on sensitive habitat

types within the Humber Estuary SAC/ SPA/ Ramsar/ SSSI (predicted to be between 1.4 and 1.5%). However, given the very small process contribution resulting from these schemes, it is assessed that there would be no significant effects on the Humber Estuary designated site as a result of acid deposition in combination with other plans/ projects.

Cumulative Emissions of Sulphur Dioxide (SO₂)

- 17.8.12 For SO₂, the air quality impact assessment identified that there would be exceedances of the 1% critical level insignificance screening threshold at receptors E1_1, E1_2 and E1_3 (nearest saltmarsh habitat) within the Humber Estuary SAC/ SPA/ Ramsar/ SSSI of 2.3 – 2.5%. However, the PEC for sulphur dioxide is not exceeded, and therefore it is concluded that there will be a neutral effect on the Humber Estuary SAC/ SPA/ Ramsar/ SSSI in combination with other plans/ projects.
- 17.8.13 As a result of the Air Dispersion Modelling used to inform the air quality assessment (see Appendix 7A in ES Volume III) and the cumulative air quality assessment undertaken, it is concluded that there would be no adverse cumulative air quality effects on the Humber Estuary SAC/ SPA/ Ramsar/ SSSI.

Noise Disturbance to Functionally Linked Habitat

- 17.8.14 The cumulative noise and vibration assessment (see section 17.6) concludes that the construction and operation of the Proposed Development at the same time as the construction or use of the new Link Road would not result in a significant cumulative noise effect. NELC has also committed to committing a sum of money via Local Plan Policy 9 to the South Humber Gateway strategic mitigation scheme, which will draw down 6.3 ha of mitigation habitat. With this mitigation, and taking into account the Applicant's proposed contribution to the South Humber Gateway strategic mitigation scheme (see Chapter 10), there is therefore no potential for cumulative adverse effects the Humber Estuary SPA/ Ramsar as a result of operational disturbance to functionally linked habitat.

Cumulative Assessment Summary

- 17.8.15 On the basis of the information available, the cumulative ecology assessment does not identify any significant cumulative ecology effects as a result of the Proposed Development and the other developments identified and assessed.

17.9 Landscape and Visual Amenity

- 17.9.1 The landscape cumulative assessment assesses the cumulative effects on identified landscape and visual receptors within the Study Area. Receptors that have been assessed in the landscape and visual impact assessment (see Chapter 11: Landscape and Visual Amenity) as experiencing negligible adverse effects as a result of the Proposed Development have not been included in the assessment of cumulative effects, as it is considered unlikely that the addition of negligible adverse effects would lead to a significant cumulative impact.
- 17.9.2 The developments potentially giving rise to cumulative effects are listed in Table 17.2. They are allocated within Landscape Type (LT) 1: Industrial Landscape (NELC, 2015) and as such this LT is likely to experience cumulative effects. The detailed landscape cumulative assessment is contained within Tables 17.4 below.
- 17.9.3 For the assessment of operational effects, the anticipated year of opening has been selected as a worst case for cumulative landscape assessment (because there would be a greater amount of built development present in the landscape).

Cumulative Effects on Landscape Character

17.9.4 Cumulative effects on landscape character are assessed at identified landscape receptors within the 5 km Study Area. Landscape receptors that have been assessed as experiencing negligible effects as a result of the Proposed Development have not been included in the assessment of cumulative effects as set out above.

Cumulative Effects on Visual Amenity

17.9.5 For the assessment of cumulative visual impacts the following other developments have been scoped out as a result of no intervisibility with the Proposed Development, the scale of the cumulative development (mass/height) or distance:

- Cress Marsh SPA Mitigation (Development Ref 2) – due to the nature of the works proposed at ground level. No planting works are currently proposed;
- Selvic Shipping CHP Boilers (Development Ref 5) – due to small scale of the proposed works;
- VPI Immingham Energy Park A (Development Ref 7) – due to distance from the Proposed Development and lack of inter-visibility; and
- VPI Immingham OCGT DCO (Development Ref: 12) – due to distance from the Proposed Development and lack of intervisibility.

17.9.6 Potential cumulative visual effects of the Proposed Development in comparison with the future baseline visual context are considered in Table 17.5 to 17.11 below by reference to representative viewpoints. The assessments contained within these Tables 17.5 to 17.11 should be read in conjunction with Figures 11.6 to 11.15 (ES Volume II) which illustrate the baseline conditions at each viewpoint.

Table 17.4: Assessment of cumulative landscape effects

LANDSCAPE TYPE	NORTH EAST LINCOLNSHIRE LANDSCAPE CHARACTER ASSESSMENT 2015	Industrial Landscape :LT1
Construction		
Sensitivity of receptor		Low
Description of impact	Other proposed developments will introduce further construction activities within the Landscape Type (LT). These will introduce additional mobile plant including piling rigs, heavy plant machinery and cranes and require further removal of grassland and vegetation within the LT. Construction activities related to the other developments will increase the geographical extent in which construction activity occurs and the density and massing of large scale structures under construction in relation to the Proposed Development. Additional indirect effects resulting from construction traffic will occur. Due to amount of construction activity introduced, there is potential to affect the tranquillity, perceptive qualities and landscape character of the LT. Such effects will be temporary, short term and reversible but occur across a considerable proportion of the LT. The magnitude of impact on the landscape character is assessed as medium, reflecting the geographical extent of change and the introduction of uncharacteristic landscape elements required by construction.	
Predicted magnitude of impact		Medium
Classification of effect		Minor adverse (not significant)
Opening		
Sensitivity of receptor		Low
Description of impact	Areas of industrial and commercial land use will be extended. Some agricultural land will be lost to extended large scale car parking behind Paragon House off Kiln Lane; agricultural land off Stallingborough Interchange will be lost to the proposed Business Park; a waste to energy plant will occupy the former Immingham Railfreight Terminal site with an adjacent energy recovery facility; an Energy From Waste plant will be introduced at Vireol PLC Energy Park Way and a single carriageway from the Moody Lane/Woad Lane to Hobson Way Roundabout will extend the road network within the LT. The other developments will extend the presence of large scale built form and associated hard and soft landscaping; road infrastructure; energy infrastructure including ancillary structures; hardstanding and car parking within the LT. A habitat area including storage lagoons will be introduced as part of a mitigation area. Several tall elements will be introduced by the other developments including stacks of 90 m and 55 m height, increasing the amount of tall structures already present. Changes resulting from the other developments will be long term and reversible. These will occur over an area larger than the Proposed Development in isolation and as a result, will have a larger effect on landscape character. As the LT is characterised by industry and the other developments are generally similar in nature and scale to existing developments and structures, the LT is considered to have low sensitivity to the other developments. In conjunction with the Cress Marsh SPA Mitigation Area the potential impacts on landscape character are considered to be low. Overall, due to these considerations, the cumulative effect on landscape character is regarded as minor adverse and not significant.	
Predicted magnitude of impact		Low
Classification of effect		Minor adverse (not significant)

Table 17.5: Assessment of cumulative effects on visual amenity – VP1

VIEWPOINT 1: FARMSHOP HOTEL, A180				
Grid reference	Receptor type	Elevation (mAOD)	Distance from Proposed Development (km)	Direction of view
518804, 411844	Hotel and Business users	13.4	4.40	East-north-east
Other Developments				
<ul style="list-style-type: none"> • Stallingborough Link Road (Development Ref: 1) • Renewable power facility - Kiln Lane (Development Ref: 4) • Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref: 6) • Great Coates Renewable Energy Centre (Development Ref 8) • Waste to Energy – Immingham Railfreight (Development Ref: 9) • North Beck Energy Centre (NBEC) (Development Ref: 10) • Stallingborough Interchange – Business Park (Development Ref 11) 				
TWO PHASE CONSTRUCTION				
Visual susceptibility to change		Value of view		Visual susceptibility to change
<u>Medium.</u>		<u>Low</u>		<u>Medium</u>
Size/ scale, duration and reversibility of impact at construction				
<p>Medium range views of construction activities will be limited to upper level activities as a result of intervening low level vegetation. Construction activities will be visible to the front and right of the existing SHBPS in the far distance. Construction of the proposed Stallingborough Interchange Business Park will largely be screened by intervening vegetation. Construction of the stack within the Great Coates Renewable Energy Centre will be seen as separate from that related to the Proposed Development and viewed in the context of surrounding farmland extending from the near to far distance. Progressive construction of tall structures will increase their visual impact. The impact of construction phases will be short term and reversible.</p>				
Magnitude of impact at construction				<u>Low</u>
Significance of effect at construction		Hotel/Farmshop visitors		<u>Minor adverse</u> (not significant)
OPERATION				
Visual susceptibility to change at operation		Value of view		Sensitivity of receptor
<u>Medium</u>		<u>Low</u>		<u>Medium</u>
Size/ scale, duration and reversibility of impact at operation				
<p>Views of ground level structures will be limited by intervening vegetation. The Proposed Development will extend the presence of the existing SHBPS, and the stacks here and at the Great Coates Renewable Energy Centre will be new elements on the skyline. To the north, built form within the proposed Stallingborough Interchange Business Park will be largely characteristic of the existing skyline view extending south with large power lines on the horizon the north. Structures within the Proposed Development will extend the visual presence of the existing SHBPS and the stack at Great Coates Renewable Energy Centre will be isolated but prominent within the view. Impacts will be long term and reversible.</p>				
Magnitude of impact at operation				<u>Low</u>
Significance of effect at operation		Hotel/Farmshop visitors		<u>Minor adverse</u> (not significant)

Table 17.6: Assessment of cumulative effects on visual amenity – VP2

VIEWPOINT 2: BRICKFIELD HOUSE, SOUTH MARSH RD				
Grid reference	Receptor type	Elevation (mAOD)	Distance from Proposed Development (km)	Direction of view
521293, 412788	Residential	8.7	1.75	East-north-east
Other Developments				
<ul style="list-style-type: none"> • Stallingborough Link Road (Development Ref:1) • Engineering Works – Paragon House (Development Ref 3) • Great Coates Renewable Energy Centre (Development Ref 8) 				
TWO PHASE CONSTRUCTION				
Visual susceptibility to change		Value of view		Sensitivity of receptor
<u>High</u>		<u>Low</u>		<u>Medium</u>
Size/ scale, duration and reversibility of impact at construction				
Oblique views of ground level construction operations in the far distance within the Proposed Development, Great Coates Renewable Energy Centre and North East Lincolnshire Link Road would be limited by intervening vegetation while those in the middle ground at the mitigation area and car parking in the middle distance will be largely obscured by a close proximity garden boundary beech hedge. The tallest structures to be constructed will progressively become more visible from upper storey gable end window. The impact of construction phases will be short term and reversible.				
Magnitude of impact at construction				<u>Low</u>
Significance of effect at construction		Residents	<u>Minor adverse</u> (not significant)	
OPERATION				
Visual susceptibility to change at operation		Value of view		Sensitivity of receptor
<u>High</u>		<u>Low</u>		<u>Medium</u>
Size/ scale, duration and reversibility of impact at operation				
The Proposed Development and Great Coates Renewable Energy Centre will extend the presence of industrial structures in the view. These will be largely characteristic of the type of industry locally. The extended car parking at Paragon House to the north will largely be screened by roadside planting. Impacts will be long term and reversible.				
Magnitude of impact at operation				<u>Low</u>
Significance of effect at operation		Residents	<u>Minor adverse</u> (not significant)	

Table 17.7: Assessment of cumulative effects on visual amenity – VP3

VIEWPOINT 3: CARR LANE PROW				
Grid reference	Receptor type	Elevation (mAOD)	Distance from Proposed Development (km)	Direction of view
521096, 412143	Footpath users	4.3	2.25	North-east
Other Developments				
<ul style="list-style-type: none"> • Stallingborough Link Road (Development Ref: 1) • Great Coates Renewable Energy Centre (Development Ref 8) 				
TWO PHASE CONSTRUCTION				
Visual susceptibility to change		Value of view		Sensitivity of receptor
<u>Medium</u>		<u>Low</u>		<u>Medium</u>
Size/ scale, duration and reversibility of impact at construction				
Views of ground level construction operations would be limited by the A180 road embankment and associated scattered trees. Impacts would largely remain the same as the Proposed Development in isolation with the addition of the progressive increase in visual impact of the stack within Great Coates Renewable Energy Centre. The impact of construction phases will be short term and reversible.				
Magnitude of impact at construction				<u>Low</u>
Significance of effect at construction		Footpath users	<u>Minor adverse</u> (not significant)	
OPERATION				
Visual susceptibility to change at operation		Value of view		Sensitivity of receptor
<u>Medium</u>		<u>Low</u>		<u>Medium</u>
Size/ scale, duration and reversibility of impact at operation				
Visual impacts will largely remain the same as at construction. The Proposed Development and Great Coates Renewable Energy Centre will increase the presence of industrial elements on the skyline. Massing and placement of the stacks will reduce this impact. Impacts will be long term and reversible.				
Magnitude of impact at operation				<u>Low</u>
Significance of effect at operation		Footpath users	<u>Minor adverse</u> (not significant)	

Table 17.8: Assessment of cumulative effects on visual amenity – VP4

VIEWPOINT 4: PRIMROSE COTTAGE				
Grid reference	Receptor type	Elevation (mAOD)	Distance from Proposed Development (km)	Direction of view
521902, 412050	Residential	1.4	1.65	North-east
Other Developments				
<ul style="list-style-type: none"> • Stallingborough Link Road (Development Ref: 1) • Engineering Works – Paragon House (Development Ref: 3) • Renewable power facility - Kiln Lane (Development Ref: 4) • Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref: 6) • Great Coates Renewable Energy Centre (Development Ref 8) • North Beck Energy Centre (NBEC) (Development Ref: 10) 				
TWO PHASE CONSTRUCTION				
Visual susceptibility to change		Value of view		Sensitivity of receptor
<u>High</u>		<u>Low</u>		<u>Medium</u>
Size/ scale, duration and reversibility of impact at construction				
Views of low level construction operations would be screened by property boundary trees and intervening vegetation to the north east but more open to views of developments located to the north west. The impact of construction phases will greater than for the Proposed Development in isolation and will be short term and reversible.				
Magnitude of impact at construction				<u>Low</u>
Significance of effect at construction		Residents	<u>Minor adverse (not significant)</u>	
OPERATION				
Visual susceptibility to change at operation		Value of view		Sensitivity of receptor
<u>High</u>		<u>Low</u>		<u>Medium</u>
Size/ scale, duration and reversibility of impact at operation				
The completed Proposed Development, Great Coates Renewable Energy Centre and the cluster of developments to the north west of the property will increase the massing and size of structures within the view while increasing the dominance of industrial structures. Great Coates Renewable Energy Centre will be visually assimilated into existing structures. Impacts will be greater than the Proposed Development in isolation and will be long term and reversible.				
Magnitude of impact at operation				<u>Low</u>
Significance of effect at operation		Residents	<u>Minor adverse (not significant)</u>	

Table 17.9: Assessment of cumulative effects on visual amenity – VP5

VIEWPOINT 5: BEECHWOOD FARM CARVERY				
Grid reference	Receptor type	Elevation (mAOD)	Distance from Proposed Development (km)	Direction of view
523357, 411478	Inn/Restaurant	15.3	1.85	North
Other Developments				
<ul style="list-style-type: none"> • Stallingborough Link Road (Development Ref: 1) • Engineering Works – Paragon House (Development Ref: 3) • Renewable power facility - Kiln Lane (Development Ref: 4) • Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref: 6) • Great Coates Renewable Energy Centre (Development Ref 8) • North Beck Energy Centre (NBEC) (Development Ref: 10) 				
TWO PHASE CONSTRUCTION				
Visual susceptibility to change		Value of view		Sensitivity of receptor
Medium		Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Views of low level construction operations would be screened by the existing Lenzing Fibres buildings and intervening vegetation. Clear views of operations above this level at the Proposed Development and Great Coates Renewable Energy Centre would be available. The impact of construction phases will largely be the same as for the Proposed Development in isolation and will be short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction		Visitors/Customers		Minor adverse (not significant)
OPERATION				
Visual susceptibility to change at operation		Value of view		Sensitivity of receptor
Medium		Low		Medium
Size/ scale, duration and reversibility of impact at operation				
The completed Proposed Development and Great Coates Renewable Energy Centre will increase the massing and size of structures within the view while increasing the dominance of industrial structures. Great Coates Renewable Energy Centre will be visually assimilated into existing structures. Impacts will largely be the same as the Proposed Development in isolation and will be long term and reversible.				
Magnitude of impact at operation				Low
Significance of effect at operation		Visitors/Customers		Minor adverse (not significant)

Table 17.10: Assessment of cumulative effects on visual amenity – VP7

VIEWPOINT 7: IMMINGHAM SOUTH, PROW				
Grid reference	Receptor type	Elevation (mAOD)	Distance from Proposed Development (km)	Direction of view
518577, 413771	Residents and footpath users	6.7	4.35	East-south-east
Other Developments				
<ul style="list-style-type: none"> Renewable power facility - Kiln Lane (Development Ref: 4) Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref: 6) Waste to Energy – Immingham Railfreight (Development Ref: 9) North Beck Energy Centre (NBEC) (Development Ref: 10) Stallingborough Interchange – Business Park (Development Ref 11) 				
TWO PHASE CONSTRUCTION				
Visual susceptibility to change		Value of view		Sensitivity of receptor
Medium		Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Long range views of construction will be limited to upper level activities as a result of intervening vegetation. Waste to Energy, Immingham Railfreight and North Beck Energy Centre will be the most visible developments, due to their mass, height of structures and close proximity. The views beyond to the Renewable power facility at Kiln Lane and the Waste Tyre to Energy Pyrolysis Plant will be partially screened by these developments. The impact of construction phases will be <u>short term and reversible</u> .				
Magnitude of impact at construction				Low
Significance of effect at construction		Residents and footpath users	Minor adverse (not significant)	
OPERATION				
Visual susceptibility to change at operation		Value of view		Sensitivity of receptor
There is no change to susceptibility at this assessment scenario. Therefore susceptibility is considered to be <u>medium</u>		Low		Medium
Size/ scale, duration and reversibility of impact at operation				
The Proposed Development will be partially visible as a separate entity to the left of the existing South Humber Bank Power Station. The Waste to Energy, Immingham Railfreight and North Beck Energy Centre developments will increase the presence of industrial elements on the skyline to the north. These developments will extend the presence of industrial structures in the view. These will be largely characteristic of the type of industry locally. Impacts will be long term and reversible.				
Magnitude of impact at operation				Low
Significance of effect at operation		Residents and footpath users	Minor adverse (not significant)	

Table 17.11: Assessment of cumulative effects on visual amenity – VP8

VIEWPOINT 8: MAUXHALL FARM, PROW				
Grid reference	Receptor type	Elevation (mAOD)	Distance from Proposed Development (km)	Direction of view
519177, 413200	Residents and footpath users	3.6	3.75	East
Other Developments				
<ul style="list-style-type: none"> • Stallingborough Link Road (Development Ref: 1) • Engineering Works – Paragon House (Development Ref: 3) • Great Coates Renewable Energy Centre (Development Ref: 8) • Stallingborough Interchange – Business Park (Development Ref 11) 				
TWO PHASE CONSTRUCTION				
Visual susceptibility to change		Value of view		Sensitivity of receptor
Medium		Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Construction activity at ground level will largely be obscured by intervening vegetation and landform. Progressive construction of the tallest structures within the Stallingborough Interchange Business Park will extend across a large proportion of the view with Engineering Works, Paragon House and the Proposed Development behind. The stack at Great Coates Renewable Energy Centre will be visible in the far distance and isolated from other development. Due to extent of construction activity in view resulting from the Business Park construction, the impact of construction phases will be larger than for the Proposed Development in isolation, while remaining short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction		Residents and footpath users	Minor adverse (not significant)	
OPERATION				
Visual susceptibility to change at operation		Value of view		Sensitivity of receptor
Medium		Low		Medium
Size/ scale, duration and reversibility of impact at operation				
An extended presence of industrial and large scale structures would be observed, partially screened by intervening vegetation and the A1173. The uppermost sections of stacks and larger buildings within the Business Park in the middle distance will be visible, with the latter extending across the view. Lower parts will be obscured with traffic on the A1173 also filtering the view. Impacts will be greater than the Proposed Development in isolation due to the relatively close proximity of the Business Park and will be long term and reversible.				
Magnitude of impact at operation				Low
Significance of effect at operation		Residents and footpath users	Minor adverse (not significant)	

Table 17.12: Assessment of cumulative effects on visual amenity – VP9

VIEWPOINT 9: MIDDLE DRAIN PROW				
Grid reference	Receptor type	Elevation (mAOD)	Distance from Proposed Development (km)	Direction of view
522276, 413642	Footpath users	5.0	0.65	East-south-east
Other Developments				
<ul style="list-style-type: none"> • Stallingborough Link Road (Development Ref: 1) • Engineering Works – Paragon House (Development Ref 3) • Renewable power facility - Kiln Lane (Development Ref: 4) • Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref: 6) • Great Coates Renewable Energy Centre (Development Ref 8) • Waste to Energy – Immingham Railfreight (Development Ref: 9) • North Beck Energy Centre (NBEC) (Development Ref: 10) 				
TWO PHASE CONSTRUCTION				
Visual susceptibility to change		Value of view		Sensitivity of receptor
<u>Medium.</u>		<u>Low</u>		<u>Medium</u>
Size/ scale, duration and reversibility of impact at construction				
An open view of construction activities in the near to middle distance will be observed. Activities related to the Proposed Development will be seen to immediate left of the existing SHBPS. Construction of the uppermost parts of the stack within Great Coates Renewable Energy Centre will be viewed within the context of existing industrial development. The impact of construction phases will be similar to the Proposed Development in isolation and will be short term and reversible.				
Magnitude of impact at construction				<u>Medium</u>
Significance of effect at construction		Footpath users		<u>Moderate adverse (significant)</u>
OPERATION				
Visual susceptibility to change at operation		Value of view		Sensitivity of receptor
<u>Medium</u>		<u>Low</u>		<u>Medium</u>
Size/ scale, duration and reversibility of impact at operation				
Views of the completed projects will result in the increased presence of industrial structures forming part of the skyline. These would be visually assimilated into the existing SHBPS. Resulting impacts will be similar to those for the Proposed Development in isolation due to distance and the prominence of the existing SHBPS within the views and will be long term and reversible.				
Magnitude of impact at operation				<u>Medium</u>
Significance of effect at operation		Footpath users		<u>Moderate adverse (significant)</u>

Table 17.13: Assessment of cumulative effects on visual amenity – VP10

VIEWPOINT 10: Irby Holmes Wood PRoW				
Grid reference	Receptor type	Elevation (mAOD)	Distance from Proposed Development (km)	Direction of view
520833, 403354	Footpath users	71.5	10.2	North-north-east
Other Developments				
<ul style="list-style-type: none"> • Engineering Works – Paragon House (Development Ref 3) • Renewable power facility - Kiln Lane (Development Ref: 4) • Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref: 6) • Great Coates Renewable Energy Centre (Development Ref 8) • Waste to Energy – Immingham Railfreight (Development Ref: 9) • North Beck Energy Centre (NBEC) (Development Ref: 10) 				
TWO PHASE CONSTRUCTION				
Visual susceptibility to change		Value of view		Sensitivity of receptor
<u>High</u>		<u>High</u>		<u>High</u>
Size/ scale, duration and reversibility of impact at construction				
Long range views of construction activities related to new developments will be extremely limited due to distance and as a result of intervening vegetation for lower level activities. As the tallest structures are constructed they will be barely visible on the horizon within the wider panoramic view and the context of existing large scale structures and as an addition to the existing power station structures. The impact of each construction phase will be short term and reversible.				
Magnitude of impact at construction				<u>Very low</u>
Significance of effect at construction		Footpath users		<u>Minor adverse</u> (not significant)
OPERATION				
Visual susceptibility to change at operation		Value of view		Sensitivity of receptor
<u>High</u>		<u>High</u>		<u>High</u>
Size/ scale, duration and reversibility of impact at operation				
The extended presence of industrial and large scale developments would be observed at a distance that would make individual structures indistinguishable. Resulting impacts will be similar to those for the Proposed Development in isolation due to distance and prominence of the existing SHBPS and industrial infrastructure developments within the views. Impacts will be long term and reversible.				
Magnitude of impact at operation				<u>Very low</u>
Significance of effect at operation		Footpath users		<u>Minor adverse</u> (not significant)

Cumulative Assessment Summary

- 17.9.7 The cumulative viewpoint assessment identifies significant effects at one viewpoint, as a result of both the Proposed Development and the listed 'other developments' that can be seen from this location:
- 17.9.8 Viewpoint 9 (Footpath users) would experience moderate adverse (significant) cumulative effects during construction and operation that are similar to those experienced at the receptor as a result of the Proposed Development in isolation (see Chapter 11). Visual impacts as a result of the proposed Business Park at Stallingborough Interchange and Great Coates Renewable Energy Centre would have negligible visual effects.
- 17.9.9 Minor adverse cumulative effects that are not significant are predicted at Viewpoints 1, 2, 3, 4, 5, 7, 8 and 10. These cumulative effects are generally similar to the effects of the Proposed Development in isolation and are therefore not considered to result in a significant cumulative effect.

17.10 Geology, Hydrogeology and Land Contamination

- 17.10.1 The following developments have been considered and are all anticipated to result in negligible geological, hydrogeological and land contamination effects individually:
- Stallingborough Link Road (Development Ref 1);
 - Cress Marsh SPA Mitigation (Development Ref 2);
 - Engineering works – Paragon House (Development Ref 3); and
 - Great Cotes Renewable Energy Centre (Development Ref 8).
- 17.10.2 It is therefore considered that there is no potential for significant cumulative geological, hydrological or land contamination effects with the Proposed Development.
- 17.10.3 The following developments are located further than 1 km away from the Proposed Development and it is considered that there is therefore no potential for significant cumulative geological, hydrological or land contamination effects.
- Renewable power facility – Kiln Lane (Development Ref 4);
 - Shipping CHP Boilers (Development Ref 5);
 - Waste Tyres Pyrolysis – Immingham Railfreight (Development Ref 6);
 - VPI Immingham Energy Park A (Development Ref 7);
 - Waste to Energy Immingham Railfreight. (Development Ref 9);
 - North Beck Energy Centre (Development Ref 10);
 - Stallingborough Interchange – Business Park (Development Ref 11); and
 - VPI Immingham OCGT DCO (Development Ref 12).

17.11 Cultural Heritage

- 17.11.1 For a cumulative impact to arise as a result of physical impacts during construction, another development would have to share a boundary with the Site in order to potentially impact the same buried archaeological resource during construction. Only one of the other proposed developments is immediately adjacent to the Site, so there is no potential for cumulative physical effects on archaeological resources as a result of any of the other identified developments.

- 17.11.2 Whilst the Stallingborough Link Road scheme shares a common boundary with the Application Area of the Proposed Development, the Main Development Area is located approximately 250 m to the north-east.
- 17.11.3 An aerial photograph (see Appendix 13B in ES Volume III), displayed at the entrance of the existing SHBPS, shows the Main Development Area during the construction of the existing SHBPS. In this photograph the Main Development Area is shown to have been subject to a topsoil strip and appears to have been used as a laydown area and construction compound. Due to the nature of the archaeological features identified in the adjacent field, it is considered that any features extending into this area would have been disturbed by the works relating to the construction of the power station. As a consequence, there will not be any effect on archaeology, resulting in a neutral effect.
- 17.11.4 The application for the Stallingborough Link Road did not include a Cultural Heritage Assessment and the consultation response from the ENGIE Partnership Archaeologist (dated 28/03/2018) states that “*the potential damage to archaeological deposits by this scheme will be minimal*”. Planning permission DM/0094/18/FUL does not require the submission of any further details in relation to archaeology.
- 17.11.5 On this basis it is considered that there is no potential for significant cumulative effects on archaeology arising from either the construction or the operation of the Proposed Development.
- 17.11.6 With regards to setting, cumulative impacts can arise where the above ground built elements of a development, when viewed alongside the above ground built elements of the Proposed Development; contribute to changes to setting that affect an asset’s significance (importance).
- 17.11.7 The Cultural Heritage assessment included at Chapter 13 of this ES concludes that the Proposed Development will have either no impact or minimal impact on all the heritage assets identified. In all cases the residual significance of effect is either minor or negligible adverse i.e. not significant.
- 17.11.8 The location and scale of the other developments identified in the area have been assessed and it is considered that due to the existing industrial context, the Proposed Development would not result in any significant cumulative effects upon the setting of any designated heritage assets within the study area.

17.12 Water Resources, Flood Risk and Drainage

- 17.12.1 The majority of the other developments included on the short list (Table 17.2) have been scoped out of the water resources cumulative assessment due to the distances from the Proposed Development Site and/or the lack of connectivity to water resource receptors.
- 17.12.2 The following three developments were given further consideration due to their proximity to the Proposed Development and the available information for each site was reviewed:
- Stallingborough Link Road (Development Ref: 1);
 - Cress Marsh SPA Mitigation (Development Ref: 2); and
 - Engineering works – Paragon House (Development Ref: 3)
- 17.12.3 All developments are required to accord with the National Planning Policy Framework (NPPF) (Department for Communities and Local Government (DCLG), 2018) and local drainage policies to ensure the risk of flooding from all sources does not increase; therefore no further cumulative assessment of flood risk has been undertaken.

- 17.12.4 Potential cumulative impacts to water resources during construction processes are associated with the generation of sediments and the release into the sewer drainage network, spillage and leakage of oils and fuels, leakage of wet concrete and cement, disturbance of contaminated land, suspended sediments, and disturbance to groundwater and foul drainage.
- 17.12.5 There is also the potential that changes to water resources and drainage arrangements, as a result of the identified developments, could result in additional discharges into local water courses and changes in overall water quality. However, existing regulatory controls at both the planning and permitting (if relevant) stage would require sufficient measures to be in place during construction and operation to manage the risk of accidents and to mitigate any potential effects to an acceptable level. All developments proposing to discharge into a watercourse are required to have a discharge permit from the Environment Agency. Through the Environment Agency's permitting procedures, and in conjunction with engagement with NELC and North East Lindsey Internal Drainage Board, any issues compromising the safeguarding of water quality would be addressed at that point and monitoring controls put in place to ensure ongoing compliance. On this basis it is not considered that the construction or operation of the Proposed Development will give rise to any significant cumulative effects in conjunction with the other developments identified.

17.13 Socio-Economics

- 17.13.1 All of the developments identified will generate additional employment opportunities and associated socio-economic benefits to add to the benefits of the Proposed Development during both construction and operation. Whilst there might be a short-term risk of temporary labour shortage or local accommodation shortage should multiple projects progress simultaneously, the cumulative socio-economic effects of the other developments in the short list, together with the Proposed Development, are considered to be significantly beneficial overall.

17.14 Waste

- 17.14.1 As part of its regional planning responsibilities, NELC (the Waste Disposal Authority) has a responsibility to plan for waste management and to ensure that sufficient sites are available to provide the necessary capacity during the planning period. Further capacity may also be provided on a regional basis by waste transfers within the wider region.
- 17.14.2 Within this wider context, the effects of waste generated from the Proposed Development on the regional capacity for waste management are at such a low level that no significant cumulative effects with other developments are anticipated.

17.15 Combined Effects Assessment

- 17.15.1 Section 8.2 of the Scoping Report submitted to NELC in July 2018 defines combined effects as 'those resulting from a single development, the Proposed Development, on any one receptor that may collectively cause a greater effect (such as the combined effects of noise and air quality/ dust impacts during construction on local residents)'. There is no direct connection between the effects, other than that both could cause annoyance, whether experienced separately or together. Mitigation of combined effects is best achieved through management of operation to prevent the individual impacts themselves and reduce the likelihood of such interactions occurring. Table 17.14 below provides a qualitative assessment of the potential for combined effects.

Table 17.14: Potential for Combined Effects

POTENTIAL COMBINED EFFECT	ASSESSMENT
<p>Combined effects of air quality, noise, traffic and visual amenity impacts on human receptors</p>	<p><u>Construction</u> The assessment of dust impacts on human receptors during the construction of the Proposed Development finds the residual effect to be negligible (not significant) in all cases. Noise effects at all residential receptors during construction of the Proposed Development are predicted to be negligible (not significant) and noise effects as a result of changes in road traffic levels during construction are also predicted to be negligible (not significant). Traffic related effects on roadside receptors during construction (severance, pedestrian amenity, fear and intimidation, highway safety and driver delay) are predicted to either be minor adverse (not significant) or negligible adverse (not significant). The assessment of visual impact on identified receptors finds that there will be a moderate adverse (significant) effect on users of the footpath at Viewpoint 9 (Middle Drain PRoW) during construction activities.</p> <p>On the basis of these findings and taking into account that the construction phase is short-term it is not considered that human/residential receptors will experience significant combined effects as a result of dust, noise, road traffic and visual during the construction phase with the exception of users of the footpath at Viewpoint 9 (Middle Drain PRoW) where the visual effect in isolation is predicted to result in a moderate adverse (significant effect). It is not considered however that the combined effects considered here would alter that finding or worsen the effect.</p> <p><u>Operation</u> The Air Quality assessment undertaken finds the effect of the operation of the Proposed Development on the identified human receptors to be either minor adverse (not significant) or negligible (not significant). Noise effects at all residential receptors during the operation of the Proposed Development are predicted to be negligible (not significant) and noise effects as a result of changes in road traffic levels during operation are predicted to be negligible (not significant). Traffic related effects on roadside receptors during operation (severance, pedestrian amenity, fear and intimidation, highway safety and driver delay) are predicted to either be minor adverse (not significant) or negligible adverse (not significant). The assessment of visual impact on identified receptors finds that there will be a moderate adverse (significant) effect on users of the footpath at Viewpoint 9 (Middle Drain PRoW) during the operation of the Proposed Development.</p> <p>On the basis of these findings it is not considered that human/residential receptors will experience significant combined effects as a result of dust, noise, road traffic and visual during the operation of the Proposed Development with the exception of users of the footpath at Viewpoint 9 (Middle Drain PRoW) where the visual effect in isolation is predicted to result in a moderate adverse (significant effect). It is not considered however that the combined effects considered here would alter that finding or worsen the effect.</p>
<p>Combined effects of air quality/ dust, noise, water quality</p>	<p><u>Construction</u> The Ecology chapter considers the combined effects of noise, air quality, water quality impacts on ecological receptors in the vicinity of the Site during construction. Potential for a significant noise effect on birds if piling is undertaken during the winter period has been identified and appropriate</p>

POTENTIAL COMBINED EFFECT	ASSESSMENT
impacts on ecological receptors	<p>mitigation will be implemented (such as using Continuous Flight Auger piling techniques or applying seasonal restrictions) to reduce the effect. The loss of semi-improved grassland from the Site is also identified as a significant adverse effect, which will be mitigated by the creation of species-rich grassland within the Site to reduce the effect. No significant residual effects are identified and no significant combined effects on ecological receptors are identified.</p> <p><u>Operation</u> No significant effects or significant combined effects on ecological receptors are identified as a result of the operation of the Proposed Development.</p>

17.16 Limitations

- 17.16.1 Any limitations that were encountered during the individual assessments are detailed within each of the Chapters referenced.
- 17.16.2 The cumulative assessment is based on the currently available information on other potential or committed developments in the vicinity of the Proposed Development.

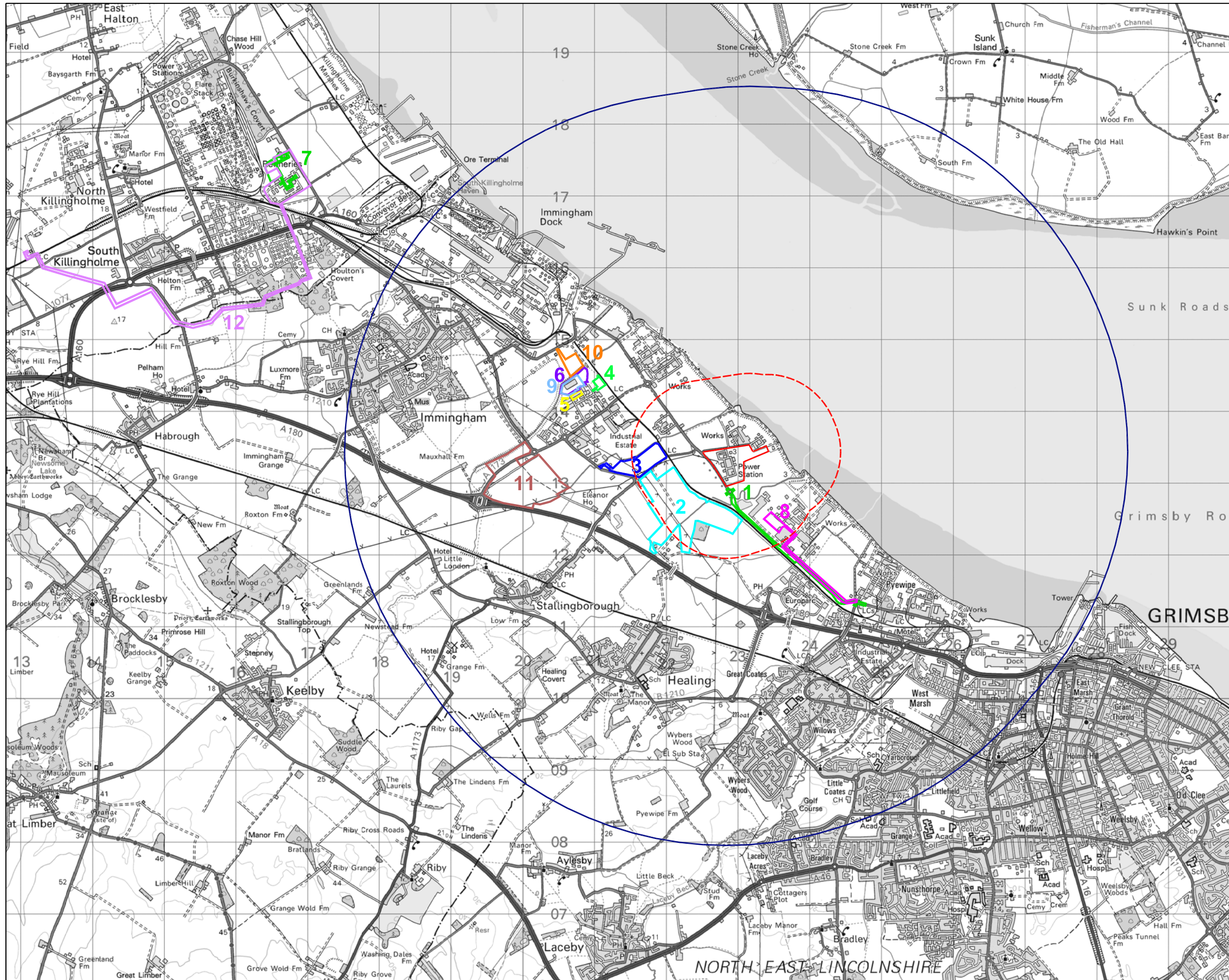
17.17 Conclusions

- 17.17.1 The assessment of cumulative effects has considered a number of other developments within the vicinity of the Site and the potential for significant cumulative effects to arise from the other identified developments together with the Proposed Development.
- 17.17.2 Through the consideration of the information available (at the time of assessment) it is concluded that there is the potential for:
 - significant adverse cumulative visual effects at one receptor during construction (but no greater than for the Proposed Development in isolation).
- 17.17.3 All other assessment topics have concluded that there is no potential for significant cumulative effects to arise as a result of the construction or operational phases of the Proposed Development when considered alongside the other identified developments.
- 17.17.4 The assessment of combined effects has not identified any significant combined effects where the combination of effects would result in a different rating of effect to that already predicted in the individual technical assessment.

17.18 Referenced Planning Applications

- DM/0094/18/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=P34286LJHRX00>
- DM/0099/18/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=P3BP97LJHY700>
- DM/0147/16/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=O2FV60LJJC300>
- DM/0195/17/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=OLSEPFLLJJ9B00>
- DM/1050/16/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=OFYXRQLJMCB00>
- DM/0848/14/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=N9MK1VLJJO600>
- DM/0449/17/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=OPQDU9LJMEY00>
- DM/0333/17/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=ONOJKLJKS400>
- DM/0717/16/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=OAPUT0LJI3T00>
- PA/2018/155 - <https://apps.northlincs.gov.uk/application/pa-2018-155>
- DM/0153/17/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=OLBAPXLJIUY00>
- PA/2018/918 - <https://apps.northlincs.gov.uk/application/pa-2018-918>
- TWA 8/1/13 - [https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010007/TR010007-000088-6.1.1%20Non-Technical%20Summary%20of%20the%20Environmental%20Statement%20\(APP14a\).pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010007/TR010007-000088-6.1.1%20Non-Technical%20Summary%20of%20the%20Environmental%20Statement%20(APP14a).pdf)
- EN060004 - [REDACTED]
- DM/0329/18/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=P7SKY0LJLJ200>
- DM/0628/18/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=PCFBTYLJHHS00>
- DM/0026/18/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=P2C4HALJ02B00>
- DM/0105/18/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=P3F907LJI1400>

- DM/1146/17/FUL - <http://planninganddevelopment.nelincs.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=P0LHNCLJFQN00>
- PA/SCO/2017/155 - <https://infrastructure.planninginspectorate.gov.uk/projects/north-east/vpi-immingham-ocgt/?ipcsection=advice>



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- Planning Application Boundary
- 1km Buffer
- 5km Buffer
- 1 Stallingborough Link Road (DM/0094/18/FUL)
- 2 Cress Marsh SPA Mitigation Area (DM0099/18/FUL)
- 3 Engineering Works Paragon House (DM/0147/16/FUL)
- 4 Renewable Power Facility - Kiln Lane (DM/0848/14/FUL)
- 5 Selvic Shipping CHP Boilers (DM/0449/17/FUL)
- 6 Waste Tyre Pyrolysis - Immingham Railfreight (DM/0333/17/FUL)
- 7 VPI-Immingham Energy Park A (PA/2018/9/18)
- 8 Great Coates Renewable Energy Centre (DM0329/18/FUL)
- 9 Waste to Energy - Immingham Railfreight (DM/0628/18/FUL)
- 10 North Beck Energy Centre (DM/0026/18/FUL)
- 11 Stallingborough Interchange Business Park (DM/0105/18/FUL)
- 12 VPI-Immingham OCGT DCO (PA/SCO/2017/155)

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Purpose of Issue
ENVIRONMENTAL STATEMENT

Client
EP SHB

Project Title
SOUTH HUMBER BANK ENERGY CENTRE

Application Document Ref
CUMULATIVE DEVELOPMENTS (SHORT LIST)

Drawn RP	Checked LK	Approved IC	Date 29/11/2018
AECOM Internal Project No. 60580855		Scale @ A3 1:50,000	

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FIGURE 17.1